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# Insulating Concrete Forms Construction Cost Analysis

NAHB Research Center, Inc.

## KEYWORDS

Insulating Concrete Forms Cost Analysis, Insulating Concrete Forms, ICF, ICFs, Cost Study, Cost Comparison, NAHB Research Center, National Association of Home Builders Research Center, ICFs to Wood, building system cost study, cost, research, PCA Research, basement costs, above-grade construction costs, ICF above-grade costs, ICF costs, 2003 PCA Research, Residential research, Residential cost analysis, SN2781, Serial Number 2781.

## ABSTRACT

Insulated Concrete Forms (ICFs) have been successfully used in the United States, Canada, and Europe for over twenty years. However, builders have had to rely on experience, or proprietary software to estimate ICF construction costs. The lack of readily available installation cost data for ICF systems may be one of the barriers for greater acceptance and market share of this product. Most building materials, assemblies, and construction methods associated with residential and light commercial construction have been closely evaluated and researched to determine average installation costs. This data can be found in estimating guides, such as those published by RSMeans[1], to assist owners, developers, builders, designers, and contractors in determining construction costs. These non-proprietary estimating tools do not cover ICF construction at this time.

The purpose of this project is to collect and prepare construction cost data for ICF use in residential and light commercial construction. This will allow current ICF users and potential users to have a clear understanding of the construction costs involved for this type of building system; similar to how costs are estimated for other common construction assemblies.

This report summarizes ICF costing data obtained by the NAHB Research Center through an extensive survey of experienced ICF builders and contractors. Average material and labor costs have been developed and presented in this report. The summarized data has been formatted similar to that of RSMeans. This information will provide owners, builders, designers, and contractors with a valuable resource for estimating the construction costs for ICF buildings.

## REFERENCE

NAHB Research Center, Inc., Upper Marlboro, Maryland, USA, 2004, 47 pages.

[1] *Residential Cost Data, 23rd Annual Edition*, RSMeans Construction Publishers & Consultants, Kingston, MA 2003

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## Construction Cost Analysis

By National Association of Home Builders

## INTRODUCTION

Insulated Concrete Forms (ICFs) have been successfully used in the United States, Canada, and Europe for over twenty years. However, builders have had to rely on experience, or proprietary software to estimate ICF construction costs. The lack of readily available installation cost data for ICF systems may be one of the barriers for greater acceptance and market share of this product. Most building materials, assemblies, and construction methods associated with residential and light commercial construction have been closely evaluated and researched to determine average installation costs. This data can be found in estimating guides, such as those published by RSMeans[2], to assist owners, developers, builders, designers, and contractors in determining construction costs. These non-proprietary estimating tools do not cover ICF construction at this time.

The purpose of this project is to collect and prepare construction cost data for ICF use in residential and light commercial construction. This will allow current ICF users and potential users to have a clear understanding of the construction costs involved for this type of building system; similar to how costs are estimated for other common construction assemblies.

This report summarizes ICF costing data obtained by the NAHB Research Center through an extensive survey of experienced ICF builders and contractors. Average material and labor costs have been developed and presented in this report. The summarized data has been formatted similar to that of RSMeans. This information will provide owners, builders, designers, and contractors with a valuable resource for estimating the construction costs for ICF buildings.

## OBJECTIVES

The goal of this project was to collect accurate construction cost data for residential and light commercial buildings made with ICFs. This data may then be used for submittal to construction estimating guides such as RSMeans. There were four objectives for this project. These objectives are listed as project tasks below:

### Task 1 – Identify Experienced ICF Contractors

The NAHB Research Center worked with PCA and the Insulating Concrete Form Association (ICFA) to compile a list of experienced ICF contractors and distributors (plank and block systems). An effort was made to include ICF builders from each of three regions in the U.S. typifying cold, mixed, and hot climates. These builders were selected to participate in a construction cost analysis survey.

[2] *Residential Cost Data, 23rd Annual Edition*, RSMeans Construction Publishers & Consultants, Kingston, MA 2003

## Task 2 – Develop the Cost Survey Form

A cost survey form was developed as a method to collect cost information specific to ICFs for use in residential and light-commercial above-grade and below-grade wall construction. The survey form was reviewed and approved by PCA prior to mailing to the participants.

## Task 3 – Conduct the Contractor Cost Survey

The survey form was mailed with an explanatory cover letter (see Appendix A) to each of the identified contractors (see Appendix B). A small incentive was offered to the first twenty respondents to promote a prompt return of the completed survey form.

## Task 4 – Summary Report of Cost Data

The cost data obtained from the returned survey forms was evaluated and verified relative to existing data available at the NAHB Research Center from previous work on ICF systems. The data was compiled into a format similar to that used in common construction-estimating guides.

# SURVEY METHODOLOGY

The concept for the survey was to have several ICF contractors and distributors throughout the country submit construction cost estimates on the same ICF home plan (see Appendix A). The cost estimates were to be based on flat type ICF use. A standardized home was used to ensure that each contractor provided an estimate for the same structure. The home did not necessarily represent that of a typical ICF design, but was intended to include the basic elements used in ICF construction. The model was a 4,160 square foot[3], two-story home derived by the NAHB Research Center. The survey participants received three simple wall layouts; one for the basement, one for the first floor, and one for the second floor. The window and door opening locations were specified on each layout and wall dimensions were shown. To further simplify the process, the total linear footage of wall was provided for each floor, along with the total linear footage of window and door buck. In addition, the wall thickness, wall height, and steel reinforcing schedule in the walls were specified for each floor.

The survey was split into two sections: below grade walls, and above grade walls. Each of these sections included a material cost section and a labor cost section. In the materials section, all of the elements needed to construct an ICF wall were listed. In the labor section, all labor tasks required for constructing an ICF wall were included. Participants in the survey were to fill out the form with cost estimates for each of these items. The materials and labor tasks that were included in the survey are listed below.

## Materials

- Insulating Concrete Forms (ICFs) and Accessories
- Concrete
- Reinforcing Steel

[3] Gross square footage of house plan including basement.

- Window and door buck
- Top plates
- Anchors
- Waterproofing
- Finishing (parging)

## Labor Tasks

- Placing ICFs
- Bracing
- Installing Reinforcement
- Pouring concrete
- Waterproofing
- Finishing

## Special Job Costs

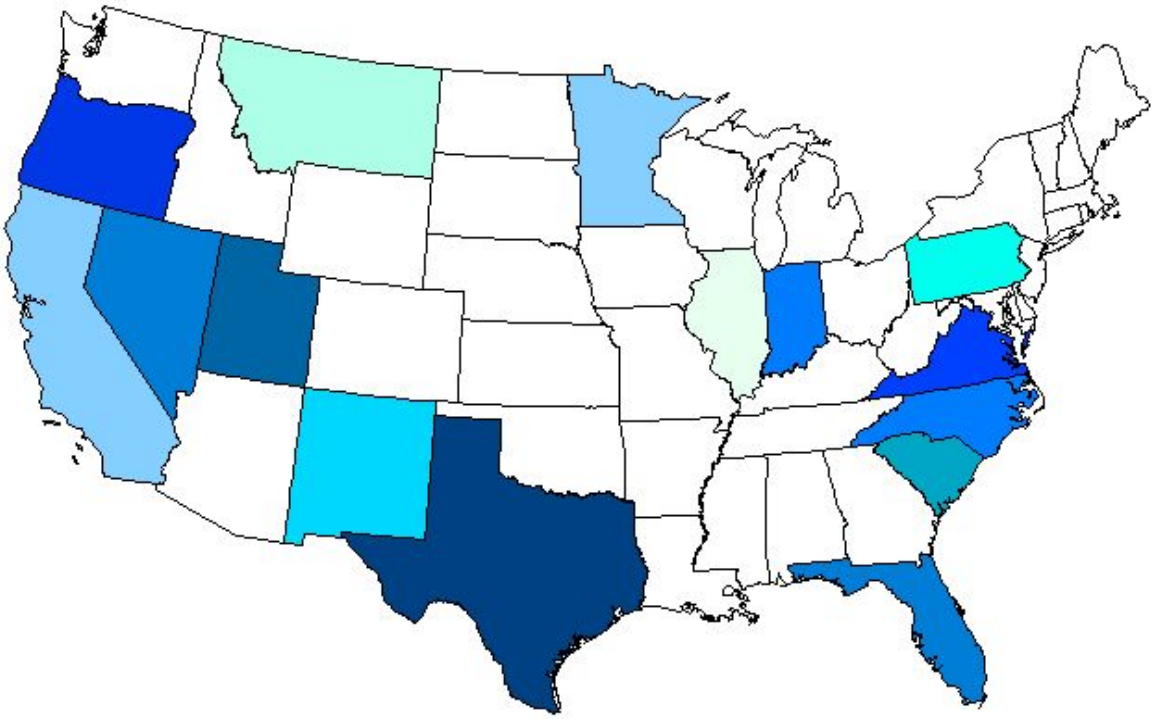
- Concrete pump
- Temporary bracing and scaffolding
- Engineering

In addition to the cost-estimating questions, each participant was asked to answer several questions pertaining to their particular business. For example: materials typically used, special methodologies used, years of experience in ICF construction, and geographic area served. This allowed for an evaluation of the survey sampling. A broad geographical range of samples and knowledge of the experience level of the sample population was desired.

The survey form was mailed to 137 ICF contractors, and 113 ICF distributors. The participants were given nine weeks to complete the survey. A reminder letter was sent out after the second week to encourage participation in the survey.

## SURVEY RESULTS

Overall, the return rate of the survey was lower than anticipated. Only seven percent of the surveys were returned to the NAHB Research Center, and some of the returned surveys were incomplete or had been completed in error. A twenty percent return rate had been expected for this research. After nine weeks, a total of 18 surveys had been returned; 14 from contractors, and 4 from distributors. The experience level of the participants that returned the survey ranged from 1 year to 19 years in the ICF construction industry. The average experience level was 9 years. The geographic distribution of the returned surveys represented the three major regions of the Untied States well, and is shown in the map below. However, some of these surveys were incomplete, and could not be used for the final summary cost analysis.



**Geographic Distribution of Returned Surveys**

(Shaded states indicate one or more surveys returned from that state)

## ICF COST ANALYSIS

The responses from the returned surveys were tabulated and evaluated. A best effort was made to interpret the intent of each of the participant's responses. Many of the responses had to be converted to values that were in the format intended by the survey, and some responses that were answered in error were omitted from the analysis. The validated and averaged data was also converted to a format that is consistent with the building assemblies' format used in RSMeans.

The tables below show each of the survey items and the responses used in the final cost analysis. Some of the responses shown have been converted to the proper units to allow for averaging. See Appendix C for a summarized table of actual responses from each respondent. The average values shown in the following tables were used to develop a combined table that matches the format used in the "building assemblies" section of RSMeans for estimating residential construction costs (see Appendix D).

### Below Grade Flat ICF Walls - Materials

This table shows the costs for standard materials used for constructing below-grade, flat-type, ICF walls. In addition, special construction costs, not necessarily related to building materials have been included. Only nine of the eighteen returned survey forms had this data filled in. This table shows the responses (if provided) from each participant. The units have been standardized

and are shown with the specific material. Averages were computed with these units, and a cost per square foot of ICF wall is included to compare with standard estimating guides such as RSMeans.

| Below Grade Flat ICF Walls – Materials | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Material** | **Respondent Number** | | | | | | | | | **AVG.** | **Entry[1]** |
| | 1 | 4 | 6 | 7 | 8 | 9 | 11 | 14 | 16 | | |
| Concrete ($/CY) | | 75 | 75 | 65 | 72 | 80 | 75 | 68 | | 72.86 | 1.80 |
| Flat ICF Forms ($/SF) | 3.38 | 2.93 | 2.73 | 3.40 | | 3.62 | 3.00 | 3.00 | 3.00 | 3.13 | 3.13 |
| Reinforcing Bar[2] ($/LF) | | | 0.27 | 0.21 | 0.24 | | 0.13 | 0.14 | | 0.20 | (V) 0.10<br>(H) 0.07 |
| Waterproofing ($/SF) | | | | 0.66 | 0.42 | 0.41 | 0.70 | 0.53 | | 0.54 | 0.54 |
| Anchor Bolts[3] ($/each) | 1.00 | | | 0.28 | 0.65 | | | | 0.60 | 0.63 | 0.02 |
| Door and Window Buck[4] ($/LF) | 1.40 | | | | | 2.50 | | 5.80 | 3.75 | 3.36 | 0.09 |
| Parging[5] ($/SF) | | | | .09 | | | .33 | .18 | | 0.20 | 0.20 |
| **Special Costs** | | | | | | | | | | | |
| Concrete Pump ($/SF) | | | | 0.54 | 0.25 | 0.28 | 0.56 | 0.24 | | 0.38 | 0.38 |
| Bracing and Scaffolding ($/LF) | 1.70 | | | 2.81 | 2.14 | 1.88 | 1.31 | | | 1.97 | 0.22 |
| Engineering ($/LF) | | | | | | 1.88 | 3.12 | 3.75 | 7.50 | 4.06 | 0.16 |
| Total material cost per square foot (below grade, 8-inch, Flat ICF wall ) | | | | | | | | | | | **6.71** |

[1]Converted to Cost per square foot of ICF wall
[2]#4 bar at 24" o.c. in vertical direction and 36" o.c. in horizontal direction
[3]Anchor bolts placed at 4' o.c.
[4]Based on 0.027 LF of buck per SF of wall
[5]Assumes half of foundation wall parged (1440 / 2 = 720 SQ FT)

## Below Grade Flat ICF Walls – Labor

This table shows labor costs for standard tasks required to construct below-grade, flat-type, ICF walls. The labor rates and man-hours used to derive the labor costs are included. The average labor costs were calculated for comparison with standard estimating guides such as RSMeans.

| Below Grade Flat ICF Walls – Labor | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Task | | Respondent Number | | | | | | | | | AVG. | Entry[1] |
| | | 1 | 6 | 7 | 8 | 9 | 11 | 14 | 16 | 17 | | |
| ICFs | | | | | | | | | | | | |
| Unload ICFs | Rate ($/hr) | | 16.00 | 15.00 | 21.00 | 30.00 | 15.00 | 12.00 | 10.00 | 15.00 | 16.75 | 0.03 |
| | Man Hours | | 4 | 2 | 1 | 2.4 | 1 | 3 | 8 | 1.5 | 2.86 | |
| | ($/SF) | | 0.04 | 0.02 | 0.01 | 0.05 | 0.01 | 0.03 | 0.06 | 0.02 | 0.03 | |
| Set Up ICFs | Rate ($/hr) | | 16.00 | 15.00 | | 30.00 | 15.60 | 12.00 | 13.20 | 15.00 | 16.69 | 1.07 |
| | Man Hours | | 160 | 40 | | 72 | 48 | 72 | | 66 | 76.33 | |
| | ($/SF) | | 1.78 | 0.42 | | 1.50 | 0.52 | 0.60 | 2.00 | 0.69 | 1.07 | |
| Align ICFs | Rate ($/hr) | | 16.00 | 15.00 | 21.00 | 30.00 | 16.00 | 12.00 | 13.00 | | 17.57 | 0.10 |
| | Man Hours | | | 20 | 2 | 9.6 | 2 | 9 | 8 | | 8.43 | |
| | ($/SF) | | | 0.21 | 0.03 | 0.20 | 0.02 | 0.08 | 0.07 | | 0.10 | |
| Total ICF | | | | | | | | | | | | 1.20 |
| Place Rebar | Rate ($/hr) | | 16.00 | 15.00 | 21.00 | 30.00 | | 12.00 | 13.00 | | 17.83 | 0.15 |
| | Man Hours | | | 20 | | 2.4 | | 24 | | | 15.46 | |
| | ($/SF) | | | 0.21 | | 0.05 | | 0.20 | | | 0.15 | |
| Fill w/ Conc. | Rate ($/hr) | | 16.00 | 15.00 | 21.00 | 30.00 | 16.00 | 12.00 | 13.00 | | 17.57 | 0.19 |
| | Man Hours | | 16 | 12 | | 7.2 | 16 | 12 | 48 | | 18.53 | |
| | ($/SF) | | 0.17 | 0.13 | | 0.15 | 0.18 | 0.10 | 0.43 | | 0.19 | |
| Water-proof | Rate ($/hr) | | 16.00 | 15.00 | 21.00 | 30.00 | 15.60 | 12.00 | 11.00 | | 17.23 | 0.28 |
| | Man Hours | | 16 | 40 | 57.6 | 4.8 | 8 | 8 | 32 | | 23.77 | |
| | ($/SF) | | 0.18 | 0.42 | 0.84 | 0.10 | 0.09 | 0.07 | 0.24 | | 0.28 | |
| Wdw / Door Bucks | Rate ($/hr) | | 16.00 | 15.00 | | 30.00 | | 12.00 | 13.00 | | 17.20 | 0.38 |
| | Man Hours | | | 20 | | 9.6 | | 48 | 80 | | 39.40 | |
| | ($/SF) | | | 0.21 | | 0.20 | | 0.40 | 0.72 | | 0.38 | |
| Finish /Plates | Rate ($/hr) | | 16.00 | 15.00 | | 30.00 | | 12.00 | 13.00 | | 17.20 | 0.13 |
| | Man Hours | | | 20 | | 2.4 | | 15 | 16 | | 13.35 | |
| | ($/SF) | | | 0.21 | | 0.05 | | 0.13 | 0.14 | | 0.13 | |
| Total labor cost per square foot (below grade, Flat ICF wall) | | | | | | | | | | | | **2.33** |

[1]Converted to Cost per square foot of ICF wall

## Above Grade Flat ICF Walls – Materials

This table shows the costs for standard materials used for constructing above-grade, flat-type, ICF walls. In addition, special construction costs, not necessarily related to building materials have been included. Only ten of the eighteen returned survey forms had this data filled in. This table shows the responses (if provided) from each participant. The units have been standardized and are shown with the specific material. Averages were computed with these units, and a cost per square foot of ICF wall is included to compare with standard estimating guides such as RSMeans.

| Above Grade Flat ICF Walls – Materials | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Material** | **Respondent Number** | | | | | | | | | | **AVG.** | **Entry[1]** |
| | 1 | 2 | 4 | 7 | 8 | 9 | 11 | 14 | 16 | 17 | | |
| Concrete ($/CY) | 70 | 70 | 75 | | 72 | 80 | 75 | 68 | | 75 | 73.12 | 1.35 |
| Flat ICF Forms ($/SF) | 3.19 | 2.32 | 2.93 | 2.24 | 2.50 | 2.62 | 3.00 | 2.94 | 3.50 | 2.15 | 2.74 | 2.74 |
| Reinforcing Bar[2] ($/LF) | 0.20 | 0.25 | | | 0.24 | | 0.20 | 0.14 | | 0.23 | 0.21 | (V) 0.05<br>(H) 0.08 |
| Waterproofing ($/SF) | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| Anchor Bolts[3] ($/ each) | 1.00 | | | | 1.00 | 0.75 | | 1.20 | | | 0.99 | 0.03 |
| Door and Window Buck[4] ($/LF) | 1.40 | 3.50 | | | | 2.42 | 1.79 | 5.77 | | 1.75 | 2.77 | 0.21 |
| Parging ($/SF) | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| **Special Costs** | | | | | | | | | | | | |
| Concrete Pump ($/SF) | 0.31 | 0.14 | | 0.27 | 0.26 | 0.31 | 0.31 | 0.24 | 0.52 | | 0.30 | 0.30 |
| Bracing and Scaffolding ($/LF) | | 3.00 | | | 4.29 | 1.88 | 1.31 | | | | 2.62 | 0.10 |
| Engineering ($/LF) | | | | | | 1.88 | | 3.75 | 9.38 | | 5.00 | 0.19 |
| Total material cost per square foot (Above grade, 6-inch, Flat ICF wall) | | | | | | | | | | | | **5.05** |

[1]Converted to dollars per square foot of ICF wall
[2]#4 bar at 48" o.c. in vertical direction and 32" o.c. in horizontal direction
[3]Anchor bolts placed at 4' o.c.
[4]Based on 0.075 LF of buck per SF of wall

## Above Grade Flat ICF Walls – Labor

This table shows labor costs for standard tasks required to construct above-grade, flat-type, ICF walls. The labor rates and man-hours used to derive the labor costs are included. The average labor costs were calculated for comparison with standard estimating guides such as RSMeans.

## Above Grade Flat ICF Walls – Labor

| Task | | Respondent Number | | | | | | | | | AVG | Entry[1] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 7 | 8 | 9 | 11 | 14 | 16 | 17 | | |
| ICFs | | | | | | | | | | | | |
| Unload ICFs | Rate ($/hr) | | | 15.00 | | 30.00 | 15.60 | 16.67 | 10.00 | 15.00 | 17.05 | 0.02 |
| | Man Hours | | | 1 | | 4.5 | 1 | | 4 | 1.5 | 2.4 | |
| | ($/SF) | | | 0.01 | | 0.05 | 0.01 | 0.01 | 0.02 | 0.01 | 0.02 | |
| Set Up ICFs | Rate ($/hr) | | | 15.00 | 21.00 | 30.00 | 15.60 | | 11.00 | 15.00 | 17.93 | 1.03 |
| | Man Hours | | | 160 | 217.6 | 158.6 | 48 | | 130 | 198 | 152 | |
| | ($/SF) | | | 0.88 | 1.68 | 1.75 | 0.28 | | 0.53 | 1.09 | 1.03 | |
| Align ICFs | Rate ($/hr) | | | 15.00 | | 30.00 | | | | | 22.50 | 0.15 |
| | Man Hours | | | 10 | | | | | | | 10 | |
| | ($/SF) | | | 0.10 | | 0.20 | | | | | 0.15 | |
| Total ICF | | | | | | | | | | | | 1.20 |
| Place Rebar | Rate ($/hr) | | | 15.00 | | 30.00 | | | | | 22.50 | 0.13 |
| | Man Hours | | | 20 | | 4.53 | | | | | 12.27 | |
| | ($/SF) | | | 0.21 | | 0.05 | | | | | 0.13 | |
| Fill w/ Conc. | Rate ($/hr) | | | 15.00 | 21.00 | 30.00 | 15.60 | | 11.00 | | 18.52 | 0.13 |
| | Man Hours | | | 12 | 4 | 18.13 | 12 | | 48 | | 18.82 | |
| | ($/SF) | | | 0.13 | 0.06 | 0.20 | 0.07 | | 0.19 | | 0.13 | |
| Water-proof | Rate ($/hr) | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. |
| | Man Hours | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | |
| | ($/SF) | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | N.A. | |
| Wdw / Door Bucks | Rate ($/hr) | | | 15.00 | | 30.00 | | | 14.00 | | 19.67 | 0.20 |
| | Man Hours | | | 20 | | | | | 32 | | 26 | |
| | ($/SF) | | | 0.21 | | 0.21 | | | 0.17 | | 0.20 | |
| Elec. /Plumb | Rate ($/hr) | | | | | | | | | | | 0.05 |
| | Man Hours | | | | | | | | | | | |
| | ($/SF) | | | | | 0.05 | | | | | 0.05 | |
| Total labor cost per square foot (above grade, Flat ICF wall) | | | | | | | | | | | | **1.71** |

[1] Cost per square foot of ICF wall

## CONCLUSION

The ICF construction cost estimates derived is this survey were generally higher than costs for other common construction types. Comparisons with wood construction costs, as published in the 2004 Residential Cost Data by RS Means, are shown in the tables below. For below grade use, ICF construction costs are about 38 percent higher than costs for wood foundations. For above grade walls, ICF construction costs are about double that of wood frame construction. This results in about a four percent increase in the total construction cost for a home similar to the one in the survey. However, the number of samples used to derive these values may be too low to provide a high level of confidence in this data. Many of the survey responses had not been answered, or had been inadvertently answered wrong. Therefore, some of the values presented in the final cost estimate were derived from small number of responses. It is recommended that this be used as a starting point for ICF costing data.

| **Below Grade Walls** | | |
|---|---|---|
| | **Wood Foundation[1]** | **Flat ICF Wall System[2]** |
| Labor Hours[3] (hrs/ft$^2$) | 0.057 | 0.139 |
| | | |
| Materials ($/ft$^2$) | 3.65 | 5.93 |
| Installation ($/ft$^2$) | 2.32 | 2.33 |
| **Total Cost[4]** ($/ft$^2$) | **5.97** | **8.26** |

[1]Based on *2004 Residential Cost Data* by RS Means for: 2x8 treated studs at 16" o.c., double top plate, single bottom plate, 3/4" treated sheathing, 15# asphalt paper, 4 mil polyethylene vapor barrier, 9" – R30 insulation batts, and headers for openings (2% of total wall SF).
[2]Based on PCA survey data for: 8" flat ICF wall, reinforcing, damproofing, parging, door and window bucks (2% of total wall SF), and engineering.
[3] Labor hours required to construct one square foot of wall.
[4] Total cost in dollars to construct one square foot of wall.

| **Above Grade Walls** | | | | |
|---|---|---|---|---|
| | **2x4 Wood Wall System[1]** | **2x6 Wood Wall System[2]** | **4" Flat ICF Wall System[3]** | **6" Flat ICF Wall System[4]** |
| Labor Hours[5] (hrs/ft$^2$) | 0.039 | 0.037 | 0.129 | 0.129 |
| | | | | |
| Materials ($/ft$^2$) | 1.28 | 1.59 | 4.11 | 4.56 |
| Installation ($/ft$^2$) | 1.78 | 1.70 | 1.81 | 1.81 |
| **Total Cost[6]** ($/ft$^2$) | **3.06** | **3.29** | **5.92** | **6.37** |

[1]Based on *2004 Residential Cost Data* by RS Means for: 2x4 studs at 16" o.c., double top plate, single bottom plate, let-in corner bracing, 1/2" sheathing, 3.5" – R11 insulation batts, and headers for openings (8% of total wall SF).
[2]Based on *2004 Residential Cost Data* by RS Means for: 2x6 studs at 24" o.c., double top plate, single bottom plate, let-in corner bracing, 1/2" sheathing, 6" – R19 insulation batts, and headers for openings (8% of total wall SF).
[3]Based on PCA survey data for: 4" flat ICF wall, reinforcing, parging, door and window bucks.
[4]Based on PCA survey data for: 6" flat ICF wall, reinforcing, parging, door and window bucks.
[5] Labor hours required to construct one square foot of wall.
[6] Total cost in dollars to construct one square foot of wall.

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# APPENDIX A – SURVEY FORM

The ICF construction costs survey used for this project is shown on the following pages.

## SECTION I. General Characteristics

1. How many years have you been working with ICFs?_____

2. a. Are you a…(please check all that apply)
   - ❑ Builder/developer
   - ❑ General contractor
   - ❑ ICF sub-contractor
   - ❑ Manufacturer
   - ❑ Other_____

   b. Do you distribute ICFs? (please check one) ☐ yes ☐ no

3. Do you use ICFs in: (Check all that apply)
   - ❑ Residential construction
   - ❑ Commercial construction
   - ❑ Other_____

4. Estimate the total number of buildings you have built using ICFs? (please check all that apply and specify #)
   - ❑ Single-family_____
   - ❑ Multi-family_____
   - ❑ Commercial_____
   - ❑ Other_____

5. In the past 12 months how many of the following have you built? (please check all that apply and specify #)
   - ❑ ICF foundations/basements _____
   - ❑ ICF above grade wall homes _____
   - ❑ Frame wall homes_____

6. In which state did you construct most of your ICF houses in the year 2002?
   State:_____ Zip code:_____

7. Check the foundation type that you use, and frequency when building with ICFs:

| ICF Foundation Type | % Foundation with ICFs |
|---|---|
| ❑ Full basement | _____% |
| ❑ Crawl space | _____% |
| ❑ Concrete slab on grade | _____% |
| ❑ Piers or raised pilings | _____% |

8. What ICF type(s) do you typically use (check all that apply)?
   - ❑ Flat
   - ❑ Waffle Grid
   - ❑ Screen Grid
   - ❑ Post & Beam
   - ❑ Other:_____

## SECTION II. Flat ICF Construction Only

***Please use average data for FLAT ICF homes you built in the past 12 months.***

9. What is the typical square footage of your ICF home for:
   a. Basement:_____ $ft^2$ or _____ linear feet (perimeter)
   b. Typical stem wall height in your area?_____
   c. Typical basement wall height?_____
   d. Typical below grade concrete thickness?_____
   e. Was ICF basement designed to be finished living space?_____
   f. Typical above-grade wall height?_____
   g. Typical above-grade wall thickness?_____

### A. BELOW GRADE FLAT ICF WALLS

**BELOW-GRADE MATERIAL COST**

***Sample Estimate- Provide your current materials and labor unit costs in the following tables--use this data to "bid" off the attached sample house plan.***

15. Do you set the footings for your foundation walls? ☐ yes ☐ no

15.a. Please fill out the following table based on the sample job:

| | Sq. ft. | Quantity (number) | Cost | No. of 90° Corners | | | No. of 45° Corners | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Inside | Outside | Cost | Inside | Outside | Cost |
| **Standard Forms*** | | | | | | | | | |

*Including shipping cost

| | Quantity Required | Item | Price/Form | Extended Cost/Form |
|---|---|---|---|---|
| **Accessories** | | Height adjusters | | |
| | | End caps | | |
| | | Door and window bucks | | |
| | | Corner straps and clips | | |
| | | Bracing system | | |
| | | Scaffolds | | |
| | | Anchor bolts | | |
| | | | | |

| | Quantity | Item | Price/Form | Extended Cost/Form |
|---|---|---|---|---|
| **Foundation Protection** | | | | |
| **Parging** | roll | Fiber mesh | | |
| | bag | PrepCoat | | |
| **Concrete** | Cu. yd | Concrete | | |
| **Waterproofing** | Sq. ft. | Please specify: | | |
| **Rebar** | Linear feet | (check one): ☐#3, ☐#4, ☐#5, ☐#6 | | |
| **Miscellaneous** | | | | |
| | roll | 1” Filament Tape | | |
| | bag | Corner Straps & clips | | |
| | | Engineering | | |
| | | Concrete pump | | |
| | | Forklift | | |
| | | Skid steer | | |
| | | Misc. | | |
| | | Zip Ties | | |

| *Labor Activity* | **Crew (number)** | **Hourly rate/crew member** | **Productive hours** | **Cost/sq. ft.** |
|---|---|---|---|---|
| Unload ICFs | | | | |
| Set up ICFs (including cutting) | | | | |
| Align ICF Walls | | | | |
| Place re-bars | | | | |
| Fill w/concrete | | | | |
| Finish/apply sole plates | | | | |
| Window/door bucks service penetration | | | | |
| Waterproofing/damp proofing | | | | |

15.c. For Flat ICFs do you use: ☐ panel ☐ block

15.d. What is your typical rebar spacing for:

- Vertical Rebar Spacing:_____On Center
- Horizontal Rebar Spacing:_____On Center

**For your rebar do you: ☐ order precut/bent ☐ cut/bend in field?**

15e. What type of ledger board do you use?

❑ Wood sole plate ☐ extended brick ledger ☐ Taper top

What is the installation cost per linear foot for the one you selected above?_____

## B. ABOVE GRADE FLAT ICF WALLS

***Sample Estimate- Provide your current materials and labor unit costs in the following tables--use this data to "bid" off the attached sample house plan.***

17.a. Please fill out the following table based on the sample job:

| | Sq. ft. | Quantity (number) | Cost | No. of 90° Corners | | | No. of 45° Corners | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Inside | Outside | Cost | Inside | Outside | Cost |
| **Standard Forms*** | | | | | | | | | |

*Including shipping cost

| | **Quantity Required** | **Item** | **Price** | **Extended Cost** |
|---|---|---|---|---|
| **Accessories** | | Height adjusters | | |
| | | End caps | | |
| | | Door and window Buck | | |
| | | Corner straps and clips | | |
| | | Bracing system | | |
| | | Scaffolds | | |
| | | Anchor bolts | | |
| | | | | |
| | **Quantity** | **Item** | **Price** | **Extended Cost** |
| **Concrete** | $yd^3$ | Concrete | | |
| **Rebar** | Linear feet | (check one): ☐#3, ☐#4, ☐#5, ☐#6 | | |
| | | | | |
| **Misc** | | | | |
| | roll | 1" Filament Tape | | |
| | bag | Corner Straps & clips | | |
| | | Engineering | | |
| | | Concrete pump | | |
| | | Forklift | | |
| | | Skid steer | | |
| | | Misc. | | |
| | | Zip Ties | | |

**ABOVE-GRADE LABOR COST:**

17.c.

| Labor Activity | Crew (number) | ~Hourly rate/crew member | Productive hours/sq. ft. | Cost/sq. ft. |
|---|---|---|---|---|
| **Unload ICFs** | | | | |
| Set up ICFs (including cutting) | | | | |
| Set Rebars | | | | |
| Window/door bucks service penetrations | | | | |
| Align walls | | | | |
| Place concrete | | | | |
| Rough electrical/plumbing | | | | |

## SECTION III.

### A. MATERIALS (FLAT ICFS ONLY)

18. What type of cement do you use?
- ❑ High flow concrete mix
- ❑ Portland Type I
- ❑ Plain/air entrained
- ❑ Other:_____

19. What type of bracing do you use for your flat ICF walls?
- ❑ Wood
- ❑ Manufactured Metal
- ❑ Site built Metal
- ❑ Other:_____

20. Do you use a waterproofing material?_____
    If yes, what is the cost/sq. ft.? _____

21. Do you use a termite shield? _____
    If yes, what is the cost/sq. ft.?_____

22. Are you required to use borate treated foam?
    If yes, what is the cost premium for this addition?_____

## B. PREMIUMS FOR TRADE CONTRACTORS

23. What trade contractors do you use and is there a premium charged? (check all that apply and circle or specify premium(s) charged)

- ❑ Siding:
  Premium charged_____
  □ <1% □ 1-5% □ 5%+
- ❑ Plumbing:
  Premium charged_____
  □ <1% □ 1-5% □ 5%+
- ❑ Drywall:
  Premium charged_____
  □ <1% □ 1-5% □ 5%+
- ❑ Electric:
  Premium charged_____
  □ <1% □ 1-5% □ 5%+
- ❑ Carpentry:
  Premium charged_____
  □ <1% □ 1-5% □ 5%+

## C. ICF COST ESTIMATOR

23. Do you use a computerized estimating tool?_____ (If yes, please circle method)
□ Developed it yourself □ Provided by supplier

## D. STRUCTURAL SYSTEMS: WALL, FLOOR, AND ROOF STRUCTURES

24. When building with ICFs what materials do you typically use for:

**a) Floors (check all that apply)**
- ❑ Wood/engineered wood joists
- ❑ Wood/engineered wood trusses
- ❑ Light-Gauge Steel Joists
- ❑ Light Gauge Steel trusses
- ❑ Open web steel joists
- ❑ Other:_____

**b) Exterior above grade walls (check all that apply)**
- ❑ Wood/engineered wood
- ❑ Light-Gauge Steel
- ❑ ICFs
- ❑ Other:_____

**c) Interior walls/partioned walls (check all that apply)**
- ❑ Wood/engineered wood
- ❑ Light-Gauge Steel
- ❑ Other:_____

**d) Roof trusses (check all that apply)**
- ❑ Wood/engineered wood
- ❑ Light-Gauge Steel
- ❑ Other:_____

## SECTION IV. REASONS YOU USE ICFS

24. For flat ICF walls, which product properties are most important to you and your customers, ranking in order from 1 to15 (1-being most important, 15-being least important).

| | |
|---|---|
| __ Energy Efficiency | __ Greater need for choice/options in the homes you provide |
| __ Mold/Mildew Resistance | __ Disaster resistance (High wind and earthquakes) |
| __ Sound/Noise management | __ Termite/Rodent Resistance |
| __ Fire Characteristics | __ Recyclable, or "Green", building products |
| __ Extended home warranties | __ Ease of handling and installation |
| __ Affordability (Price) | __ Consumer Demand |
| __ Durability | __ Strength |
| __ Other _____ | |

25. Which of the following are issues for you concerning flat ICF walls? (please check all that apply)

| | Above Grade | Below Grade |
|---|---|---|
| Installation Training/Skilled Labor | ___ | ___ |
| Lack of Homeowner demand | ___ | ___ |
| Termite Issues | ___ | ___ |
| Material Cost | ___ | ___ |
| Code Approvals | ___ | ___ |
| Engineering Cost | ___ | ___ |
| Other (specify)_____ | ___ | ___ |

26. Have you ever used, or do you currently use the *Prescriptive Method for Insulating Concrete Forms in Residential Construction*?

☐ Frequently ☐ Sometimes ☐ No ☐ Never heard of it

27. Do you think the current ICF provisions in the International Residential Code (2003 IRC) need improvement?

☐ Yes ☐ No ☐ No Opinion

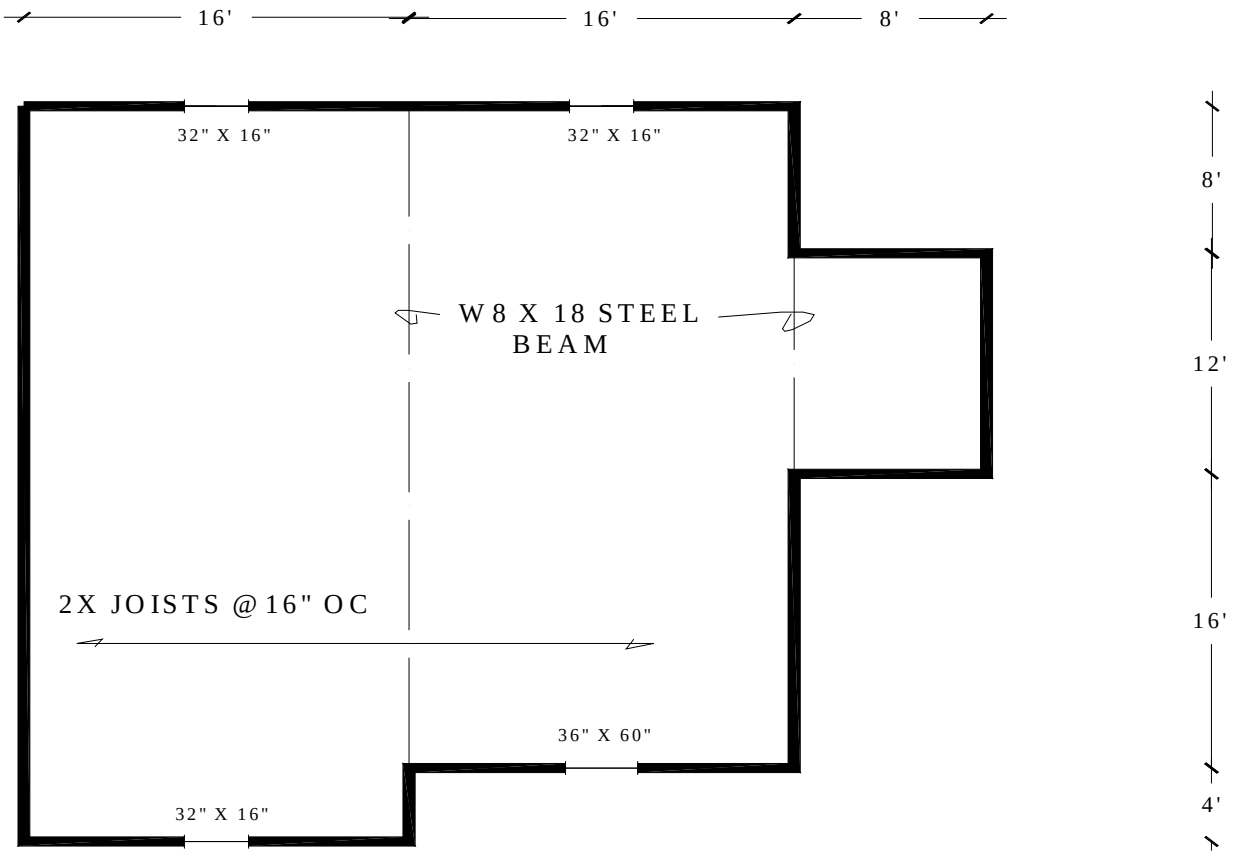
If yes, what improvements are needed?_____

_____

_____

**SAMPLE PLAN**

Please Use for Cost Estimate




# FOUNDATION PLAN

9' CEILING HEIGHT

WATERPROOF WALLS TO 8' ABOVE FOOTING

LINTEL DEPTH = 12"

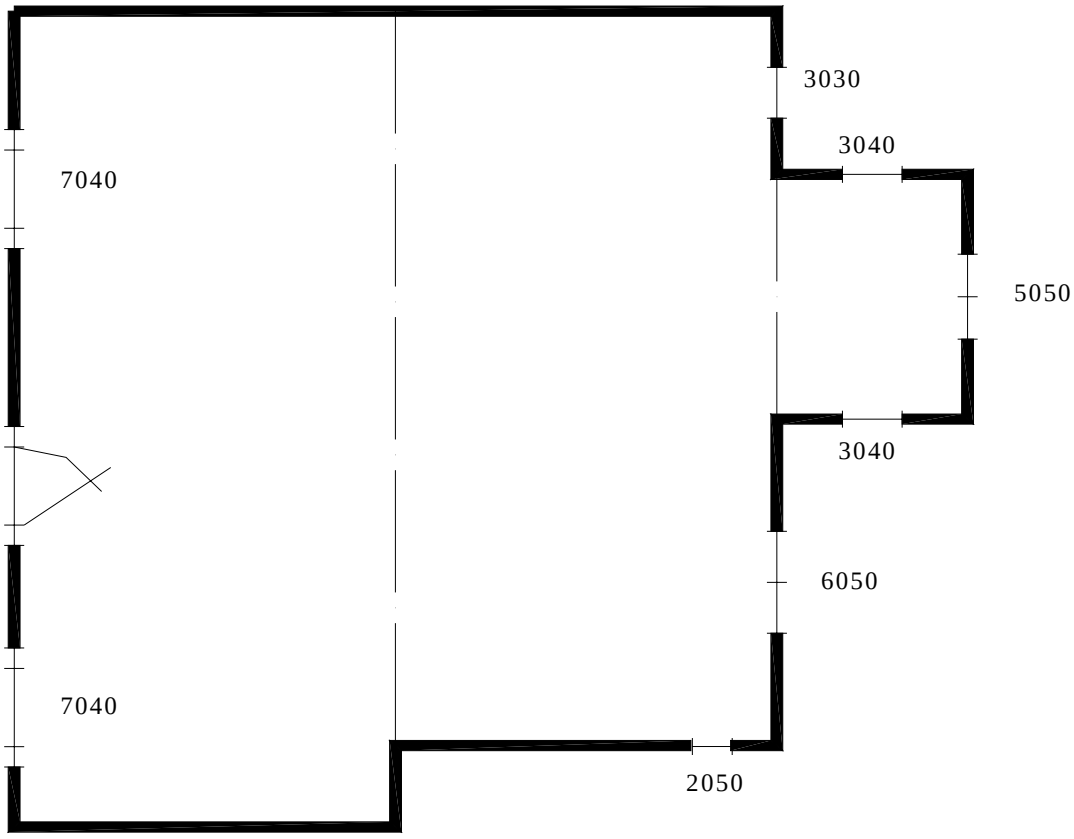
8" CONC. W/ #4 REBAR @ 24"OC VERTICAL & #4 REBAR @ 6", 36", 72", 102" ABOVE FOOTING (HORIZ)

# CALCULATIONS

GROSS WALL SQUARE FOOTAGE = 1440

WINDOW BUCK LINEAR FOOTAGE = 38

WINDOW OPENING SQUARE FOOTAGE = 25.7




# FIRST FLOOR PLAN

9' ceiling height

6" thick concrete
#4 rebar @ 48" vertical
#4 rebar @ 32" horizontal

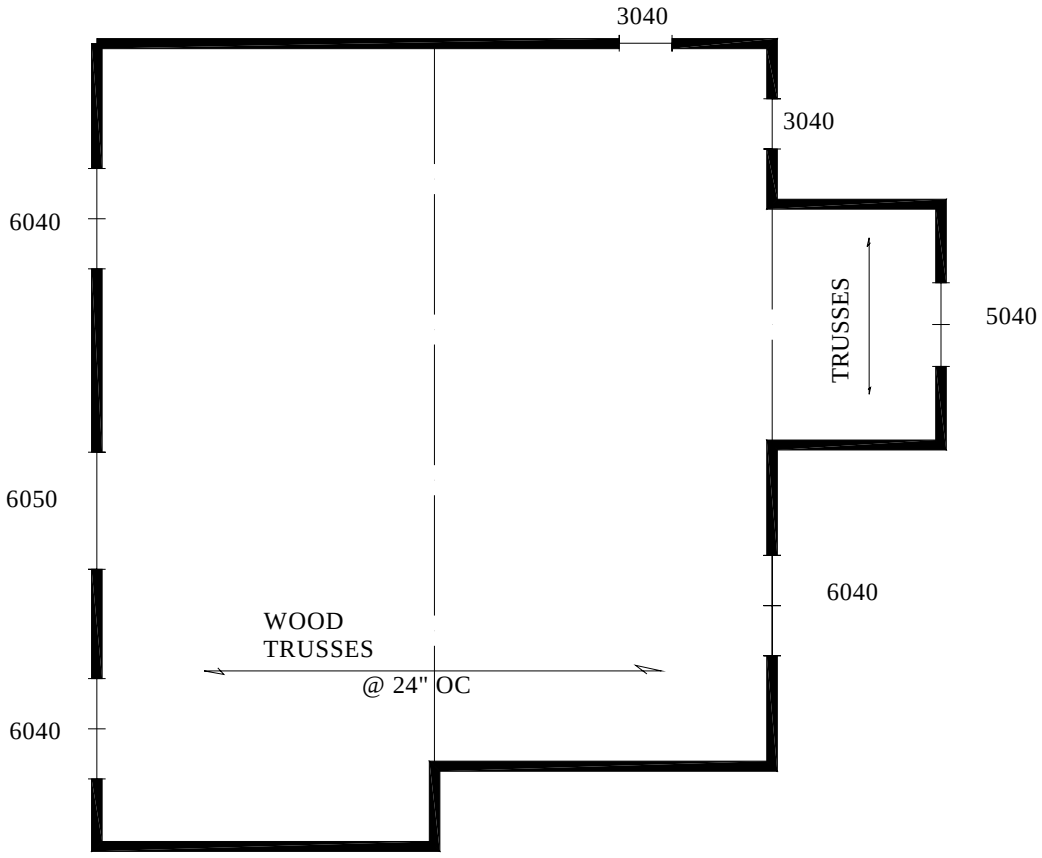
block outs (1) 14-1/2" x 24" electrical panel
(1) 4" dryer vent
(1) 3" bath fan
(1) 8" fireplace vent (through wall)

# CALCULATIONS

GROSS WALL SQUARE FOOTAGE = 1440

WINDOW BUCK LINEAR FOOTAGE = 112.7

WINDOW OPENING SQUARE FOOTAGE = 108.8




# SECOND FLOOR PLAN

8' ceiling height

wood gable end

4" concrete walls

block outs
(3) 3" bath fan

# CALCULATIONS

GROSS WALL SQUARE FOOTAGE = 1280

WINDOW BUCK LINEAR FOOTAGE = 103.2

WINDOW OPENING SQUARE FOOTAGE = 101.4

# APPENDIX B – SURVEY PARTICIPANTS

The ICF construction estimate survey was mailed to the following companies. The companies that are highlighted returned the survey to the NAHB Research Center prior to the writing of this report and were included in the construction cost estimates.

| ICF Contractors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.[1]** |
| 21st Century Building Systems | Palm Harbor | FL | 2 |
| A&L Eastern Agricultural Labs, Inc. | Richmond | VA | |
| A&S Steel Framing, Inc. | Niceville | FL | 8 |
| A.M. Enterprises | Falmouth | Maine | |
| ABCO Superior Built, Inc. | Coppell | TX | |
| ABS Supply Company | Butler | OH | |
| Adams Trucking & Supply, Inc. | Barboursville | WV | |
| Advance Foam Plastics | Denver | CO | |
| Advance Foam Plastics, Inc. | Murray | UT | 4 |
| Advanced ICF Products | Bend | OR | |
| Advantage Wall Systems, Inc. | Montreal | NC | |
| Alby Supply Company | Burlington | WI | |
| Allied Foam Products, Inc. | Gainesville | GA | |
| Arizona Radiant Heat Barrier/Quad-Lock SW | Tucson | AZ | |
| Bailey Construction Company | Metropolis | IL | |
| Blackhawk Southwest, Inc. | Silver City | NM | 10 |
| Bozeman Brick, Block & Tile | Bozeman | MT | |
| Brick & Supply Company | Appleton | WI | |
| Brock & Weigl Construction, Inc. | Reno | NV | 5 |
| Brock White Co. | St. Cloud | MN | |
| Builders Mart | Boyceville | WI | |
| Building Block Systems | Philomath | OR | |
| Canyon State Homebuilders, LLC | Prescott | AZ | |
| Central Concrete Inc. | Mankato | MN | |
| Chaney Enterprises | Waldorf | MD | |
| Cody Construction | Ellwood City | PA | |
| Columbus Coal and Lime Company | Lexington | OH | |
| Combs Construction Co. | Madison | IN | |
| Con-Core Systems | Baxter | MN | |
| Concrete Building Supply | Mapleton | MN | |
| Concrete Special Ties, Inc. | Gresham | OR | |
| Concrete Supply of Topeka, Inc. | Topeka | KS | |
| Creative Building Products, Inc. | Glen Allen | VA | 13 |
| D&W Construction of Alexandria, Inc. | Alexandria | MN | |
| D.L. Schmidt Companies | Oronoco | MN | |
| DACS Industries | St Paul | MN | |
| Daowaga Polysteel | Tahoe Vista | CA | |
| Dixie Distribution | Louisville | KY | |
| Drury Supply Company | Cape Girardeau | MO | |
| E.I. Industries, Inc. | San Jose | CA | |

[1] Response number. Indicates the order in which the surveys were returned to the NAHB Research Center.

| ICF Contractors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.[1]** |
| E.R. DupruisConcrete Co. & Polystell Forms | Vidor | TX | |
| Engineered Concrete Products, Inc. | Mt. Pleasant | SC | 16 |
| Engineered Housing Industires Inc. | Miami | FL | |
| Enviroclean Services | Wilmington | NC | |
| EPS Building Systems, LLC | Brighton | CO | |
| Erb Supply, LLC | Sarasota | FL | |
| FASTFORM Concrete Forming | Orangeville | ON | |
| Florida Polysteel, Inc. | Winter Garden | FL | |
| Foam Forming Supply | Commerce City | CO | |
| Force One Walls | St. Augustine | FL | |
| Formosa Garden Homes | Kissimmee | FL | |
| Gentry Commercial Contracting, Inc. (dba Gentry Builders) | Morehead City | NC | |
| Georgia Foam, Inc. | Gainesville | GA | |
| Glacier Lite-Form | Kalispell | MT | |
| Glossners Concrete, Inc. | Beech Creek | PA | |
| Goedecke Co., Inc. | Decatur | IL | |
| Heartland EPS | Waukegan | IL | |
| HiCaliber Inc. | St. George | UT | |
| Hi-Energy Walls | Portland | MI | |
| High Plaines Foam Building Systems, Inc. | Berthoud | CO | |
| High Plains Foam Building Systems, Inc. | Berthoud | CO | |
| HOLDFAST Technologies, LLC | Medway | OH | |
| ICF Building Products, LTD. | Millfield | OH | |
| ICF Supply | Kimberly | WI | |
| ICF Technologies, Inc. | Fridley | MN | |
| Innovative Construction Technologies | Wichita | KS | |
| Insulating Concrete Homes | Oklahoma City | OK | |
| Insulation Solutions, Inc. | East Peoria | IL | |
| IntegraSpec Nebraska, LLC | Gretna | NE | |
| Integrated Building Products | Inglefield | IN | |
| Island Coast Distributors | Port Charlotte | FL | 17 |
| J.M. King Engineering Corporation | Amarillo | TX | |
| J.W. Bird & Co., Ltd. | Dartmouth | NS | |
| JEB Contractors | Hamilton | OH | |
| Kerr's Redi-Mix | Centre | AL | |
| Larison Family Builders | Martinsville | IN | |
| Livingston's Concrete Service, Inc. | North Highlands | CA | |
| Lloyd's Development Company | Malibu | CA | |
| Lower Columbia Reward Wall Systems | Longview | WA | |

[1] Response number. Indicates the order in which the surveys were returned to the NAHB Research Center.

| ICF Contractors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.[1]** |
| Malone Lumber & Ready-Mix, Inc. | Malone | NY | |
| Manning Materials Corp. | Birdsboro | PA | |
| Mass Building Products, Inc. | Brimfield | MA | |
| MaxxBilt, Inc. | Clemson | SC | |
| Mid Atlantic Foam | Fredericksburg | VA | |
| Mike Pilley Enterprises, Inc. | Marble Falls | TX | |
| NAPPI, Inc. | Rockford | IL | |
| New York Polysteel | Amityville | NY | |
| Northwest Wall Systems | Bend | OR | 14 |
| NW Reward Wall Systems | Silverton | OR | |
| Oke Woodsmith Building Systems, Inc. | Hensall | ON | 15 |
| Panel Tech Building Systems | Miami | FL | |
| Paramont Ready Mix Concrete, Inc. | Sante Fe Springs | CA | |
| Performance Building Systems | Sugarland | TX | |
| Piedmont Wall Systems (aka Ingle Builders) | Iron Station | NC | 1 |
| Polycon, Inc. | Redmond | OR | |
| Polysteel of Minneapolis/St. Paul | Blaine | MN | |
| Polysteel Building Supply, Inc. | Fort Worth | TX | |
| Polysteel Distributing, Inc. | Richfield | UT | |
| Polysteel Midwest, LLC | Jacksonville | IL | |
| Polysteel of West Central Indiana | Lafayette | IN | |
| Polysteel Southeast Distributors | Toccoa | GA | |
| Project Net, Inc. | South St. Paul | MN | 18 |
| Quality Concrete Store | Woodburn | OR | |
| Quality Sytems, Inc. | Nashville | TN | |
| Reddi-Form ICF LLC | Bozeman | MT | 9 |
| Reddi-Wall, Inc. | Oakland | MI | |
| Reg Wood & Associates | Ventura | CA | |
| Reward Wall System of Tyler | Tyler | TX | |
| Reward Wall Systems of Ft. Wayne | Ft. Wayne | IN | 7 |
| Reward Wall Systems of N.M., Inc. | Santa Fe | NM | |
| Riefler Concrete Products | Hamburg | NY | |
| Robb Construction Company | Afton | VA | |
| Schvetz Enterprises, Inc. | Burlington | WI | |
| Seadore Masonry, Inc. | Long Pine | NE | |
| Shelly Enterprises, Inc. | Perkasie | PA | |

[1] Response number. Indicates the order in which the surveys were returned to the NAHB Research Center.

| ICF Contractors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.[1]** |
| Shoffner Construction, Inc. | Greentown | IN | |
| SIPbuilder, Inc. | Nevada City | CA | |
| Southern Concrete Materials, Inc. | Fletcher | NC | |
| Spencer Polysteel Walls | Oskaloosa | IA | |
| Stitt Energy Systems, Inc. | Rogers | AR | |
| Tara Contracting, Inc. | Greenfield | NJ | |
| Tech Building Systems Polysteel | Hillpoint | WI | |
| The Decorative Concrete Store | Cincinnati | OH | |
| Thermal Foams, Inc. | Buffalo | NY | |
| Thermal Innovations | Primghar | IA | |
| Tidewater Polysteel, Inc. | Virginia Beach | VA | |
| Transit-Mix Concrete Company | Johnson City | TN | |
| Tri County Insulated Building Systems Inc. | Burton | OH | |
| Tri-State Insulated Concrete Forms | Mabel | MN | |
| US Insulated Forms | Raleigh | NC | |
| VanHaren Insulated Concrete Forms | Farigault | MN | |
| Virginia Polysteel Wall Systems LLC | Harrisonburg | VA | |
| Vista Custom Homes, Inc. (dba Amvic) | Cedar Hill | TX | |
| Wagner & Sons Construction, Inc. | Ludington | MI | |
| Walltech Products, LLC | Petoskey | MI | |
| Wisconsin Insulated Forms | Brodhead | WI | |
| Wyoming Concrete Industries, Inc. | Wyoming | DE | |

[1] Response number. Indicates the order in which the surveys were returned to the NAHB Research Center.

| ICF Distributors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.** [1] |
| A. Anderson Building Systems | Petersburg | IL | |
| A.M. Enterprises | Falmouth | Maine | |
| ABCO Superior Built, Inc. | Coppell | TX | |
| Advanced Building Technologies, Inc. | Jupiter | FL | |
| Arid Resources | Elkhorn | NE | |
| Basement Systems, Inc. | Seymour | CT | |
| Baur Building Products | Cincinnati | OH | |
| Benn Masonry Construction, LLC | Sauquoit | NY | |
| Better Builders of Oregon, Inc. | Corvallis | OR | |
| BFJ Construction, Inc. | Palm Harbor | FL | |
| Block & Bean Construction | Lincoln | NE | |
| Blue Horse Building & Design | Dripping Springs | TX | |
| Bob Miller Masonry | Sarasota | FL | |
| Boss Building Systems (aka Ranger Concrete) | Covington | OH | |
| Brehmer Enterprises, LLC | Cheyenne | WY | |
| C & A Construction | Bloomington | IL | |
| Capital City Development | Columbus | OH | |
| Category Five Wall Systems | Baker | FL | |
| Classic Conservatories | Mountainside | NJ | |
| Combs Construction Co. | Madison | IN | |
| Construction PS | Grafton | IL | |
| Continental Homes, Inc. | Logan | UT | |
| Cotton's Concrete Foundations | St. Athens | PA | |
| Cozy Crete Construction | Oak Harbor | WA | |
| Custom Assembly Services, Inc. | Anderson | SC | |
| D.L. Schmidt Construction | Oronoco | MN | |
| D.O.C.'s Construction | Owatonna | MN | |
| Dan Thomas Builders | Winterville | NC | |
| Danmark East Metro Polysteel | Conyers | GA | |
| Dave Carr Construction, Inc. | Mount Hope | ON | |
| DBA J. Pirro Construction/Remodeling | Woodstock | IL | |
| Dee Construction Co., Inc. | State College | PA | |
| Derrick Builders | New Cumberland | PA | |
| DNC Companies | Owatonna | MN | |
| Doug Ripley's Inno-Craft Design ... | Tualatin | OR | |
| DuBrook Concrete, Inc. | Chantilly | VA | |
| Ed Chun Architectural & Construction | El Centro | CA | |
| Eggert Construction, LLC | Branford | CT | |
| Eker Brothers, Inc. | Albuquerque | NM | |
| Energy Efficient Healthy Construction Commercial/Residential | Milford | MI | |

[1] Response number. Indicates the order in which the surveys were returned to the NAHB Research Center.

| ICF Distributors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.** [1] |
| Energy Management & Engineering, Inc. | Libertyville | IA | |
| Energy Smart Solutions LLC | Arlington | TX | |
| Engineered Concrete, Inc. | Clemson | SC | |
| Eternity Building Systems, Inc. | Evans | CO | |
| Evans Construction Company | El Dorado Hills | CA | |
| Firebird Remodeling, Inc. | Glendale | AZ | |
| Foam-Form, Inc. | Tipton | GA | |
| Francis N. George, Inc. & Sons | Strykersville | NY | |
| Gentry Commercial Contracting, Inc. (dba Gentry Builders) | Morehead City | NC | |
| Greenblock of the Ozarks | Springfield | MO | |
| Greg Varner Contracting, Ltd. | Bridgewater | NS | |
| Gust Construction | Alta | WY | |
| Harrison Developers, LLC | Brimfield | MA | |
| HBR Building Supplies | Holland Landing | ON | |
| Howe Construction | Newaygo | MI | |
| ICF Builders | Richmond | ME | |
| ICF Builders | Chilton | TX | 11 |
| ICF Building Products | Houston | TX | |
| ICF Construction Company | Jacksonville | FL | |
| ICF Construction of MD | Hampstead | MD | |
| ICF Custom Building | Waubaushene | ON | |
| ICF North Building Solutions | Torrance | ON | |
| Insulated Concrete, Inc. | Lexington | NC | |
| Insulating Concrete Forms California | California City | CA | |
| Insulating Concrete Forms of Beaumont | Beaumont | TX | |
| John Jackson Masonry | Sacramento | CA | |
| JP & Sons | Bend | OR | |
| Kevin Phillips Construction | Cedar City | UT | |
| KH Construction, Inc. | Owatonna | MN | |
| Lucida Homes, Inc. | Port Isabel | TX | |
| Mass Building Products, Inc. | Brimfield | MA | |
| MDR Construction, Inc. | Spencerport | NY | |
| Medelpad Construction | Owosso | MI | |
| Midwest ICFs | Cridersville | OH | |
| Millenium Builder's Service | Summerville | SC | |
| Miller Homebuilders, Inc. | Hutchinson | KS | |
| Morton Construction | Santa Rosa | CA | 3 |
| N E L Builders | Lebanon | NH | |
| Nelson Concrete Homes. LLC | Middleton | WI | |
| New Mexico Polysteel | Farmington | NM | |
| Nickerson Construction | Ely | MN | |

[1] Response number. Indicates the order in which the surveys were returned to the NAHB Research Center.

| ICF Distributors | | | |
|---|---|---|---|
| **Company Name** | **City** | **State** | **Res.** [1] |
| Old World Builders, Inc. | Ivyland | PA | 12 |
| Pandion Group, Inc. | Gilbert | AZ | |
| Peoria County Concrete Company | Peoria | IL | |
| Renaissance Building Products | Ellwood City | PA | |
| Richlyn Construction, Inc. | Mandeville | LA | |
| River Oaks Builders | Searcy | AR | |
| RiverStone Design & Build, Inc. | Denfield | ON | |
| RKC, Inc. | Cincinnati | OH | |
| Rock Solid Walls | Margate | FL | |
| Scardina Builders, Inc. | San Jose | CA | |
| Schultz Foundations | Mapleton | MN | |
| Schvetz Enterprises, Inc. | Burlington | WI | |
| Secure Comfort Homes | New Berlin | IL | |
| Sellers Group | West Jordan | UT | |
| Sherwood Engineering & Construction | Clarksville | AR | |
| Simpson Burke Construction | Warrenton | VA | |
| StahlBeton Homes, L.P. | Houston | TX | |
| Standard 895 Direct | Welch | MN | |
| Standard ICF | Gray | ME | |
| Steffes Concrete Construction | Beaver Dam | WI | |
| Structural Resistance | Myrtle Beach | SC | |
| Suncon, Inc. | Alton | IL | 6 |
| Superior Built Construction | Coppell | TX | |
| The Pinnacle Grp. Inc. | Beckley | WV | |
| Thermal Concept Builders and Distributors | Colgate | WI | |
| Thermalwall Structures | Eden Prairie | MN | |
| Tim Savage Construction | Groveton | NH | |
| Tri City Thermo-Form, Inc. | Bay City | MI | |
| Universal Contractors | Northwood | IA | |
| Van Wieren Bros. Construction | West Winfield | NY | |
| Wheat City Concrete Products, Ltd. | Brandon | MB | |
| Zetah Construction, Inc. | Bemidji | MN | |

# APPENDIX C – SURVEY RESPONSE SUMMARY

The survey responses were tabulated and are shown on the following pages.

| Form Costs - Below Grade | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 90 deg Corners | | | 45 deg Corners | | |
| Resp # | Sq Ft | Quantity | Cost | | Inside | Outside | Cost | Inside | Outside | Cost |
| 1 | 5.33 | 172 | $18.00 | | 21 | 49 | $18.00 | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | 1440 | | $4,220.00 | | 10 | 10 | $415.00 [a] | | | |
| 5 | | | | | | | | | | |
| 6 | 1040 | 210 | $2,835.00 | | 6 | 18 | $324.00 | 0 | 0 | $0.00 |
| 7 | 1113 | 210 | $3,780.00 | | 21 | 49 | $1,260.00 | | | |
| 8[b] | 12 | 93 | $32.50 | | 60 | | $16.00 | | | |
| 9 | 1408 | 352 | $14.50 | | 90 | | Included | 0 | 0 | $0.00 |
| 10 | | | | | | | | | | |
| 11 | 1012 | 190 | $16.00 | | 70 | | $16.00 | 0 | 0 | $0.00 |
| 12 | | | | | | | | | | |
| 13* | 5.33 | | | | | | | 0 | 0 | $0.00 |
| 14 | 5.33 | 218 | $16.00 | | 70 | | $16.00 | | | $16.00 |
| 15* | | | | | | | | | | |
| 16 | 5300 | 1000 | $3.00 | | 90 | 90 | $15.00 | 90 | 90 | $15.00 |
| 17 | | | | | | | | | | |
| 18 | 5.33 | | $10.95 | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

a - Included
b - 8" wall
* - included a quote from proprietary software

## Accessories - Below Grade

| ITEM | Respondent | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **Height Adjusters** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | | | | | 0 | | | 0 | | 0 | | | 0 | | 0 | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **End Caps** | 0 | | | | | 0 | | | 0 | | 0 | | | 0 | | 0 | | |
| Qty | | | | | | | | | | | | | | | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Door and Window Bucks** | | | | | | | | | | | | | | | | | | |
| Qty | 38 LF | | | | | 0 | 3 | 40 LF | 40 LF | | 2/2/2.0 | | | 38 LF | | 40 LF | | |
| Price Form | $1.40 | | | | | | $75.00 | $0.46 | | | 25/8/3 | | | $5.80 | | $48.00 | | |
| Ext Cost | $53 | | | | | | $90 | $18 | $100 | | $72 | | | $220 | | $150 | | |
| **Corner Straps and Clips** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | | | | | 0 | | 0 | 0 | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Bracing System** | | | | | | | | | | | | | | | | | | |
| Qty | 680 LF | | | | | ? LF | 60 | 28 | 30 | | 35 | | | | | 40 | | |
| Price Form | $0.40 | | | | | $0.33 | $360 | 1.75/day | $10.00 | | 2/day | | | | | | | |
| Ext Cost | $272 | | | | | | $450 | $343 | $300 | | $210 | | | $60 | | | | |
| **Scaffolds** | | | | | | | | | | | | | | | | | | |
| Qty | 10 sets | | | | | 0 | 1 | | 3 | | | | | | | | | |
| Price Form | $6.00 | | | | | | $150.00 | | | | | | | | | | | |
| Ext Cost | $60 | | | | | | $187 | inc | $60 | | | | | inc | | | | |
| **Anchor Bolts** | | | | | | | | | | | | | | | | | | |
| Qty | 35 | | | | | 92 | 40 | 166 | | | 0 | | | | | 400 | | |
| Price Form | $1.00 | | | | | $1.00 | $0.28 | $0.65 | | | | | | | | $0.60 | | |
| Ext Cost | $35 | | | | | | $14 | $108 | | | | | | | | $0.60 | | |
| **Parging** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | CY | .5 rl | | | | SF | | | | | | | |
| Price Form | | | | | | $5.00 | $55.00 | | | | $2.00 | | | $65.00 | | | | |
| Ext Cost | | | | | | | $68.00 | | | | $240 | | | $130 | | | | |
| **Concrete** | | | | | | | | | | | | | | | | | | |
| Qty | | | | 36 CY | | CY | 35 CY | 37 CY | 54 CY | | 38 CY | | | 27 CY | | | | |
| Price Form | | | | $75.00 | | $75.00 | $65.00 | $72.00 | $80.00 | | $75.00 | | | $68.00 | | | | |
| Ext Cost | | | | $2,700 | | | $81 | $2,664 | $4,320 | | $2,850 | | | $1,836 | | | | |
| **Water Proofing** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 1040 SF | 1255SF | 1328SF | 1280SF | | 1440SF | | | 1400SF | | 1300SF | | |
| Price Form | | | | | | $0 | $658 | $93 | | | .42/.28 | | | $93 | | $5.30 | | |
| Ext Cost | | | | | | | $823 | $560 | $528 | | $1,008 | | | $744 | | $1.00 | | |
| **Rebar** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 6240LF | 1450LF | 2202LF | | | 1520LF | | | 2300LF | | 1600LF | | |
| Price Form | | | | | | $0.27 | $246 | $0.24 | | | $0.13 | | | $0.14 | | $1.50 | | |
| Ext Cost | | | | | | | $308 | $528 | $268 | | $203 | | | $322 | | $1.35 | | |
| **1" Filament tape** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 0 | | 0 | | | 0 | | | 0 | | 6 rl | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | $0.01 | | |

| Accessories - Below Grade | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Corner Straps and Clips** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 0 | | 0 | | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Engineering** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 0 | | | | | | | | 1 | | 1200 | | |
| Price Form | | | | | | | | $500 | | | | | | | | $1.50 | | |
| Ext Cost | | | | | | | | $5,000 | $300 | | $500 | | | $600 | | $1,200 | | |
| **Concrete Pump** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 0 | 5 hrs | 4 hrs | | | | | | 1 | | 2000 | | |
| Price Form | | | | | | | $625 | $90 | | | | | | | | $2 | | |
| Ext Cost | | | | | | | $781 | $360 | $400 | | $800 | | | $350 | | $0 | | |
| **Forklift** | | | | | | | | | | | | | | | | | | |
| Qty | | | | 1 | | 0 | | 0 | | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | $700 | | | | | | | | | | | | | | |
| **Skid Steer** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 1 | | 0 | | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Misc** | | | | | | | Glue | | | | fast | | | glue | | pamduits | | |
| Qty | | | | | | 0 | | | | | | | | | | 1600 | | |
| Price Form | | | | | | | $100 | $0.10 | | | | | | $13 | | $0.30 | | |
| Ext Cost | | | | | | | $125 | | | | $500 | | | $52 | | $0.30 | | |
| **Zip Ties** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | 0 | | 0 | | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |

## Labor - Below Grade

| Labor Activity | Respondent | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **Unlaod ICFs** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 2 | 1 | 2 | | 1 | | | 3 | | 2 | 3 | 2 |
| $ / hr | $60 | | | | | $16.00 | $15.00 | $21.00 | $30.00 | | $15.60 | | | $12.00 | | $10.00 | $15.00 | $20.00 |
| Productive Hrs | 0.5 | | | | | 1 | 1 | 1 | ? | | 1 | | | 1 | | 4 | 0.5 | |
| Cost / SF | $30.00 | | | | | | $0.01 | neglig | $0.05 | | | | | $0.03 | | $0.03 | | |
| **Set Up ICFs** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 4 | .08 x SF | 3 | | 3 | | | 3 | | 5 | 3 | 3 |
| $ / hr | $60 | | | | | $16.00 | $15.00 | $21.00 | $30.00 | | $15.60 | | | $12.00 | | 18/15/11 | $15.00 | |
| Productive Hrs | 16 | | | | | 160 | 40 | | ? | | 16 | | | 24 | | 600 | 66 | 16 |
| Cost / SF | $960 | | | | | | $0.42 | | $1.50 | | $0.52 | | | $0.78 | | $2.00 | | |
| **Align ICFs** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 4 | 2 | 2 | | 2 | | | 3 | | 2 | | 3 |
| $ / hr | $60 | | | | | $16 | $15 | $21 | $30 | | $16 | | | $12 | | 15/11/ | | |
| Productive Hrs | 2 | | | | | 160 | 20 | 1 | ? | | 1 | | | 3 | | 4 | | 3 |
| Cost / SF | $120 | | | | | | $0.21 | | $0.20 | | | | | $0.09 | | $0.06 | | |
| **Place Rebar** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 4 | 1 | 1 | | inc | | | 3 | | 2 | | 2 |
| $ / hr | $60 | | | | | $16 | $15 | $21 | $30 | | | | | $12 | | 15/11/ | | |
| Productive Hrs | 2 | | | | | 160 | 20 | | ? | | | | | 24 | | 200 | | 3 |
| Cost / SF | $120 | | | | | | $0.21 | | $0.05 | | | | | $0.78 | | $2.50 | | |
| **Fill w/Concrete** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 4 | 4 to 6 | 3 | | 4 | | | 3 | | 4 | | 3 |
| $ / hr | $60 | | | | | $16 | $15 | $21 | $30 | | $16 | | | $12 | | 15/11/ | | |
| Productive Hrs | 4 | | | | | 16 | 12 | 1h/9CY | ? | | 4 | | | 4 | | 48 | | 3 |
| Cost / SF | $240 | | | | | | $0.12 | | $0.15 | | | | | $0.12 | | $0.25 | | |
| **Finish / Sole Plt** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 4 | | 2 | | inc | | | 3 | | 2 | | |
| $ / hr | $60 | | | | | $16.00 | $15.00 | framer | $30.00 | | | | | $12.00 | | 15/11/ | | |
| Productive Hrs | NA | | | | | no | 20 | work | ? | | | | | 5 | | 8 | | |
| Cost / SF | NA | | | | | | $0.21 | | $0.05 | | | | | $0.15 | | $0.10 | | |
| **Window /door buck** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | 4 | 4 | 100 /sm | 1 | | 4 | | | 3 | | 2 | | 2 |
| $ / hr | $60 | | | | | $16.00 | $15.00 | 150/lg | $30.00 | | inc | | | $12 | | 15/11/ | | |
| Productive Hrs | 2 | | | | | no | 20 | | ? | | | | | 16 | | 80 | | 4 |
| Cost / SF | $120 | | | | | | $0.21 | | $0.20 | | | | | $0.48 | | $1.00 | | |
| **Waterproofing** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | | | | | | 4 | 4 | 4 | 2 | | 4 | | | 3 | | 2 | | 2 |
| $ / hr | | | | | | $16.00 | $15.00 | $21.00 | $30.00 | | $15.60 | | | $12.00 | | $11.00 | | |
| Productive Hrs | | | | | | 16 | 40 | | ? | | 2 | | | 8 | | 16 | | 6 |
| Cost / SF | | | | | | | $0.42 | $0.84 | $0.10 | | | | | $0.24 | | $0.50 | | |

$2.30

| Form Costs - Above Grade | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 90 deg Corners | | | 45 deg Corners | | | |
| Resp # | Sq Ft | Quantity | Cost | | Inside | Outside | Cost | Inside | Outside | Cost | |
| 1 | 5.33 | 300 | $17.00 | | 42 | 98 | $17.00 | | | | |
| 2 | 2777 | 537 | $6,434.00 | | 140 | | $1,677.00 | 0 | 0 | 0 | 1st /2cd floors |
| 3 | | | | | | | | | | | |
| 4 | 1440 | | $4,220.00 | | 10 | 10 | $415.00 [a] | | | | |
| 5 | | | | | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | 1331 | 170 | $2,975.00 | | 30 | 70 | $1,750.00 | | | | |
| 8[b] | 12 | 82 | $30.00 | | 60 | | $15.00 | 0 | 0 | $0.00 | |
| 9 | 2456 | 444 | $6,438.00 | | 170 | | $2,465.00 | 0 | 0 | $0.00 | |
| 10 | | | | | | | | | | | |
| 11 | 1332 | 195 | $16.00 | | 70 | | $16.00 | 0 | 0 | $0.00 | |
| 12 | | | | | | | | | | | |
| 13* | | | | | | | | | | | |
| 14 | | 400 | $15.65 | | 130 | | $15.65 | | | | |
| 15* | | | | | | | | | | | |
| 16 | 1484 | 280 | $5,200.00 | | 40 | 30 | $850.00 | 0 | 0 | $0.00 | |
| 17 | 1328 | 168 | $2,856.00 | | 21 | 49 | $1,225.00 | 0 | 0 | $0.00 | |
| 18 | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

a - Included
b - 6" wall
* - included a quote from their own software

## Accessories - Above Grade

| ITEM | Respondent | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **Height Adjusters** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 0 | | | | | | | | | 0 | | | 0 | | 0 | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **End Caps** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 0 | | | | | | | | | 0 | | | 0 | | 0 | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Door and Window Bucks** | | | | | | | | | | | | | | | | | | |
| Qty | 320 | 216 | | | | | 7 | 270LF | 220 | | 10/6/2025 | | | 215 | | 20 | 113 LF | |
| Price Form | $1.40 | $3.50 | | | | | $203 | $0.46 | | | 25/8/35 | | | $5.80 | | $1,000 | $1.75 | |
| Ext Cost | $448 | $755 | | | | | $254 | $125 | $533 | | $386 | | | $1,247 | | $2,000 | $197 | |
| **Corner Straps and Clips** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 0 | | | | | | 0 | | | 0 | | | 0 | | 0 | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Bracing System** | | | | | | | | | | | | | | | | | | |
| Qty | ru | 53 | | | | | ru | 28 | 30 | | 35 | | | | | inc | 33 | |
| Price Form | | $8.00 | | | | | | $1.75 | $10.00 | | | | | | | | $1.50 | |
| Ext Cost | $0 | $480 | | | | | | $686 | $300 | | $210 | | | | | | $50 | |
| **Scaffolds** | | | | | | | | | | | | | | | | | | |
| Qty | ru | 0 | | | | | | inc | 3 | | 54 | | | 45 | | | 25 | |
| Price Form | | | | | | | | | $20.00 | | | | | $2.00 | | | $1.00 | |
| Ext Cost | $0 | | | | | | | | $60 | | $45 | | | $180 | | | $25 | |
| **Anchor Bolts** | | | | | | | | | | | | | | | | | | |
| Qty | 70 | 0 | | | | | 0 | 83/166 | 50 | | | | | 60 | | 50 | | |
| Price Form | $1.00 | | | | | | | 1.35/.65 | $0.75 | | | | | $1.20 | | | | |
| Ext Cost | $70 | | | | | | | $220 | $38 | | | | | $72 | | $100 | | |
| **Parging** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | | | | | | | | | | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Concrete** | | | | | | | | | | | | | | | | | | |
| Qty | 46 CY | 36.9CY | | 27 CY | | | 27.6CY | 40 CY | 42 CY | | 27 CY | | | 51 CY | | 24 CY | 26 CY | |
| Price Form | $70.00 | $70.00 | $100 | $75.00 | | | $1,794 | $72.00 | $80.00 | | $75.00 | | | $68.00 | | $1,680 | $75.00 | |
| Ext Cost | $3,220 | $2,581 | | $2,025 | | | $2,243 | $2,880 | $3,360 | | $2,055 | | | $3,468 | | $3,500 | $1,950 | |
| **Water Proofing** | | | | | | | | | | | | | | | | | | |
| Qty | | | | | | | | | | | | | | | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Rebar** | | | | | | | | | | | | | | | | | | |
| Qty | 1800LF | 1868LF | | | | | 1050LF | 4160LF | 2456SF | | 1200 | | | | | 2400 | 2142 | |
| Price Form | $0.20 | $0.25 | | | | | $178 | $0.24 | | | $0.20 | | | $0.14 | | $250 | $0.23 | |
| Ext Cost | $360 | $467 | | | | | $223 | $998 | $442 | | $240 | | | $970 | | $500 | $493 | |

| Accessories - Above Grade | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1" Filament tape** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 1 | | | | | | 0 | | | 0 | | | 0 | | 6 | | |
| Price Form | | | | | | | | | | | 0 | | | | | 24 | | |
| Ext Cost | | inc | | | | | | | | | 0 | | | | | $48.00 | | |
| **Corner Straps and Clips** | | | | | | | | | | | 0 | | | | | | | |
| Qty | 0 | 1 | | | | | | 0 | | | | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | inc | | | | | | | | | | | | | | | | |
| **Engineering** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 0 | | | | | | | | | 0 | | | 1 | | 1200 | | |
| Price Form | | | | | | | | | | | | | | $600 | | | | |
| Ext Cost | | | | | | | | $5,000 | $300 | | | | | $600 | | $1,500 | | |
| **Concrete Pump** | | | | | | | | | | | | | | | | | | |
| Qty | 2 | 4 hrs | | | | | 5 hr | 8 hrs | | | | | | 2 | | | 3 | |
| Price Form | $450 | $100 | | | | | $625 | $95 | | | | | | $350 | | $1,000 | $90 | |
| Ext Cost | $900 | $400 | | | | | $781 | $760 | $900 | | $900 | | | $700 | | $1,500 | $225 | |
| **Forklift** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 0 | | | | | | 0 | | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Skid Steer** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 0 | | | | | | 0 | | | 0 | | | 0 | | | | |
| Price Form | | | | | | | | | | | | | | | | | | |
| Ext Cost | | | | | | | | | | | | | | | | | | |
| **Misc** | | adhes | | | | | foam | | | | fast | | | glue | | | | |
| Qty | 2 | 2 | | | | | | | | | | | | 8 | | | | |
| Price Form | $150 | $10 | | | | | $100 | $0.10 | | | | | | $13 | | | | |
| Ext Cost | $300 | $20 | | | | | $125 | | | | $500 | | | $104 | | | | |
| **Zip Ties** | | | | | | | | | | | | | | | | | | |
| Qty | 0 | 1 | | | | | | 0 | | | 0 | | | 0 | | | 50 | |
| Price Form | | | | | | | | | | | | | | | | | 0.08 | |
| Ext Cost | | inc | | | | | | | | | | | | | | | $4.00 | |

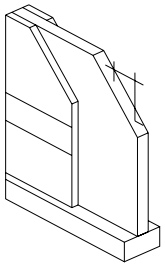
## Labor - Above Grade

| Labor Activity | Respondent | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| **Unlaod ICFs** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | 3 to 4 | | | | | 2 | | 2 | | 1 | | | 3 | | 2 | 3 | |
| $ / hr | $60 | 8 to 20 | | | | | $15.00 | | $30.00 | | $15.60 | | | $50.00 | | $10.00 | $15.00 | |
| Productive Hrs | 0.5 | ? | | | | | 1 | | ? | | 1 | | | 1 | | 2 | 0.5 | |
| Cost / SF | $30.00 | $2.50 | | | | | $0.01 | | $0.05 | | | | | $0.01 | | $0.03 | | |
| **Set Up ICFs** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | 3 to 4 | | | | | 4 | 4 | 3 | | 3 | | | 3 | | 4 | 3 | |
| $ / hr | $60 | 8 to 20 | | | | | $15.00 | $21.00 | $30.00 | | $15.60 | | | $50.00 | | $11.00 | $15.00 | |
| Productive Hrs | 40 | ? | | | | | 40 | 0.08 | ? | | 16 | | | 40 | | 130 | 66 | |
| Cost / SF | $2,400 | $2.50 | | | | | $0.42 | $1.68 | $1.75 | | | | | $0.40 | | $1.80 | | |
| **Set Rebar** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | 3 to 4 | | | | | 4 | | 1 | | inc | | | 3 | | | | |
| $ / hr | $60 | 8 to 20 | | | | | $15 | inc | $30 | | | | | $50 | | | | |
| Productive Hrs | 3 | ? | | | | | 20 | | ? | | | | | 40 | | | | |
| Cost / SF | $180 | $2.50 | | | | | $0.21 | | $0.05 | | | | | $0.40 | | | | |
| **Window /door buck** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | 3 to 4 | | | | | 4 | | 1 | | inc | | | 3 | | 2 | | |
| $ / hr | $60 | 8 to 20 | | | | | $15 | inc | $30 | | | | | $50 | | $14 | | |
| Productive Hrs | 5 | ? | | | | | 20 | | ? | | | | | 24 | | 32 | | |
| Cost / SF | $300 | $2.50 | | | | | $0.21 | | $0.20 | | | | | $0.24 | | $0.20 | | |
| **Align Walls** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | 3 to 4 | | | | | 4 | | 2 | | inc | | | 3 | | 2 | | |
| $ / hr | $60 | 8 to 20 | | | | | $15 | inc | $30 | | | | | $50 | | $2 | | |
| Productive Hrs | 4 | ? | | | | | 10 | | ? | | | | | 5 | | 4 | | |
| Cost / SF | $240 | $2.50 | | | | | $0.10 | | $0.20 | | | | | $0.05 | | $0.05 | | |
| **Place Concrete** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | 3 to 4 | | | | | 4 | 4 | 3 | | 3 | | | 3 | | 4 | | |
| $ / hr | $60 | 8 to 20 | | | | | $15.00 | $21.00 | $30.00 | | $15.60 | | | $50.00 | | $11.00 | | |
| Productive Hrs | 8 | ? | | | | | 12 | 1 | ? | | 4 | | | 10 | | 48 | | |
| Cost / SF | $480 | $2.50 | | | | | $0.12 | $0.24 | $0.20 | | | | | $0.10 | | $0.06 | | |
| **Rough Elec/Plumb** | | | | | | | | | | | | | | | | | | |
| Crew (nember) | 3 | | | | | | 2 | | 1 | | | | | | | | | |
| $ / hr | $60 | | | | | | $35.00 | ? | $40.00 | | | | | none | | | | |
| Productive Hrs | 1 | | | | | | 50 | | ? | | | | | | | | | |
| Cost / SF | $60 | | | | | | $1.21 | | $0.05 | | | | | | | $0.01 | | |

# APPENDIX D – ICF COSTS (RSMeans FORMAT)

The following pages show the ICF cost information in a format that that of RSMeans for estimating costs of building assemblies.

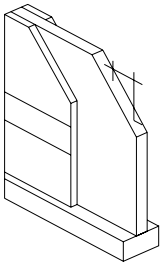
## 2 | FOUNDATIONS ## FLAT Insulated Concrete Form (ICF) Wall Systems



| System Description | Quan. | Unit | Labor Hrs | Cost per S.F. Material | Inst | TOTAL |
|---|---|---|---|---|---|---|
| Concrete, 8" thick, 2500 psi | 0.024 | CY | 0.013 | 1.80 | 0.19 | 1.99 |
| ICFs | 0.1875 | Ea | 0.061 | 3.13 | 1.20 | 4.33 |
| Reinforcing (#4 Bar) | | | | | | |
| Vertical @24"o.c. | 0.5 | LF | 0.006 | 0.10 | 0.08 | 0.18 |
| Horizontal @36" o.c. | 0.33 | LF | 0.006 | 0.07 | 0.07 | 0.14 |
| Concrete Pump | | Hr | | | | 0.38 |
| Waterproofing (to 8' above footing) | 1 | SF | 0.017 | 0.54 | 0.28 | 0.82 |
| Anchor Bolts, 1/2" diamter, 4' o.c. | 0.03 | Ea | | 0.02 | | 0.02 |
| Door and Window Bucks[1] | 0.027 | LF | 0.027 | 0.09 | 0.38 | 0.47 |
| Bracing System | | Ea | | | | 0.22 |
| Parging | 1 | SF | 0.009 | 0.20 | 0.13 | 0.33 |
| Engineering | | Hr | | | | 0.16 |
| TOTAL | | SF | 0.139 | 5.95 | 2.33 | **9.04** |

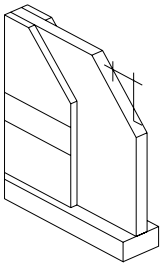
1. Based on 0.027 LF of WB per SQ ft

## 2 | WALLS ## FLAT Insulated Concrete Form (ICF) Wall Systems



| System Description | Quan. | Unit | Labor Hrs | Cost per S.F. Material | Inst | TOTAL |
|---|---|---|---|---|---|---|
| Concrete,6" thick, 2500 psi | 0.018 | CY | 0.013 | 1.35 | 0.13 | 1.48 |
| ICFs | 0.1875 | Ea | 0.060 | 2.74 | 1.20 | 3.94 |
| Reinforcing (#4 Bar) | | | | | | |
| Vertical @48"o.c. | 0.25 | LF | 0.002 | 0.05 | 0.06 | 0.11 |
| Horizontal @32" o.c. | 0.375 | LF | 0.003 | 0.08 | 0.07 | 0.15 |
| Concrete Pump | | Hr | | | | 0.30 |
| Rough Electric / Plumbing | | | 0.015 | | 0.05 | 0.05 |
| Anchor Bolts, 1/2" diamter | 0.03 | Ea | | 0.03 | | 0.03 |
| Door and Window Bucks[1] | 0.078 | LF | 0.027 | 0.21 | 0.20 | 0.41 |
| Bracing System | | Ea | | | | 0.10 |
| Parging | 1 | SF | 0.009 | 0.10 | 0.10 | 0.20 |
| Engineering | | Hr | | | | 0.19 |
| TOTAL | | SF | 0.129 | 4.56 | 1.81 | **6.96** |

**2 | WALLS** ## **FLAT Insulated Concrete Form (ICF) Wall Systems**



| System Description | Quan. | Unit | Labor Hrs | Cost per S.F. Material | Inst | TOTAL |
|---|---|---|---|---|---|---|
| Concrete,4" thick, 2500 psi | 0.012 | CY | 0.013 | 0.90 | 0.13 | 1.03 |
| ICFs | 0.1875 | Ea | 0.060 | 2.74 | 1.20 | 3.94 |
| Reinforcing (#4 Bar) | | | | | | |
| Vertical @48"o.c. | 0.25 | LF | 0.002 | 0.05 | 0.06 | 0.11 |
| Horizontal @32" o.c. | 0.375 | LF | 0.003 | 0.08 | 0.07 | 0.15 |
| Concrete Pump | | Hr | | | | 0.30 |
| Rough Electric / Plumbing | | | 0.015 | | 0.05 | 0.04 |
| Anchor Bolts, 1/2" diamter | 0.03 | Ea | | 0.03 | | 0.03 |
| Door and Window Bucks[1] | 0.072 | LF | 0.027 | 0.21 | 0.20 | 0.41 |
| Bracing System | | Ea | | | | 0.10 |
| Parging | 1 | SF | 0.009 | 0.10 | 0.10 | 0.20 |
| Engineering | | Hr | | | | 0.19 |
| TOTAL | | SF | 0.129 | 4.11 | 1.81 | **6.5** |