

Comparitive Construction and Energy Analysis

ICF vs. Other Conventional Building Methods

Project Name: *New Hospital - VAMC, FL*
 Project Size: *142,879 SF (Approx.)*
 Project Location: *Orlando, FL*



TF System - The Vertical ICF
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Construction Cost Estimates and R-Value Comparisons

Construction Method	Estimated Cost	% Comp.	R-Value
12" Spit Face CMU Construction	\$ 1,747,459.94	175%	7.69
8" CMU with interior metal furring	\$ 1,453,405.34	146%	12.69
Structrual Steel Frame, 6" Metal Stud Infill Framing, 1/2" Gypsum Board Sheathing, 2" Exterior Rigind Insulation, 6" Interior Blanket Insulation, and exterior building wrap.	\$ 1,145,434.69	115%	29.00

8" ICF Wall System **\$ 996,669.06** **22.50**

Schedule Impact

Construction Method	Est. Labor Hours	% Comp.
12" Spit Face CMU Construction	18,657.40	347%
8" CMU with interior metal furring	14,378.10	267%
Structrual Steel Frame, 6" Metal Stud Infill Framing, 1/2" Gypsum Board Sheathing, 2" Exterior Rigind Insulation, 6" Interior Blanket Insulation, and exterior building wrap.	6,550.50	122%

8" ICF Wall System **5,384.20**

Estimated Energy Comparison (Year 1)

Estimated Annual Energy Cost (Conventional Construction)	\$ 170,769.63	
Estimated Annual Energy Cost (ICF Construction w/ EnergyWise Reccomendations)	\$ 75,346.77	
Estimated Annual Energy Savings		\$ (95,422.85)

20 Year Energy Forecast

Estimated Energy Savings (Years 1-5)	537,559.82
Estimated Energy Savings (Years 6-10)	718,278.14
Estimated Energy Savings (Years 11-15)	959,750.82
Estimated Energy Savings (Years 16-20)	1,282,402.45

20 Year Energy Savings **3,497,991.24**

NOTES:

Energy consumption based upon Energy Wise Consumption Projection Dated March 10, 2010 using an average of 6 similar projects located in Minneapolis, MN, ICF exterior wall construction and other Energy Wise construction reccomendations.

Construction cost estimates and schedule impact based upon RS Means Cost data Q1 2010 (see details attached)

20 Year Energy Forecast based on calculations based upon data provided by US Department of Energy through December 2009

Prepared By: **TF System - The Vertical ICF**

P: (920) 983-9960 • F: (920) 983-9962 • E: sales@tfsystem.com • W: www.TFSystem.com

Division - Details (8" ICF Construction)

Tuesday, April 20, 2010

3:02:15 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Total	Mat Total	Subs Total	Equip Total	Other Total	Grand Total
3	Concrete								
3110460	C.I.P. concrete forms, insulating, left in place, 8" wall, straight block, 16" x 48" (5.33 SF), S.F. is for exterior face, but includes forms for both faces (total R22)	16,334.00	EA	186,604.52	304,413.49				491,018.01
3210600	Reinforcing Steel, in place, walls, #3 to #7, A615, grade 60, incl labor for accessories, excl material for accessories	105	ton	79,328.03	74,085.38				153,413.40
3310220	Structural concrete, ready mix, normal weight, 4000 PSI, includes local aggregate, sand, Portland cement and water, delivered, excludes all additives and treatments	2,121.00	CY		256,929.46				256,929.46
3310700	Structural concrete, placing, walls, pumped, 8" thick, includes strike off & consolidation, excludes material	2,121.00	CY	76,027.46			19,280.74		95,308.20
	Concrete Total			341,960.00	635,428.32		19,280.74		996,669.06
	Grand Total			341,960.00	635,428.32		19,280.74		996,669.06

Notes

Calculations based upon RS Means Cost Data Q1 2010 adjusted by City State Index for Green Bay, WI.

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Division - Details (12" Split Face Decorative CMU Construction)

Monday, April 19, 2010

6:31:08 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Total	Mat Total	Subs Total	Equip Total	Other Total	Grand Total
4	Masonry								
4810182	Concrete block, decorative, split face or scored split face, 2000 psi, 12" x 8" x 16", excludes scaffolding, grout and reinforcing	86,893.00	SF	899,559.78	573,963.02				1,473,522.80
	Masonry Total			899,559.78	573,963.02				1,473,522.80
7	Thermal & Moisture Protection								
7210900	Wall Insulation, Rigid, expanded polystyrene, 2" thick, R7.69	86,893.00	SF	54,620.94	70,430.25				125,051.19
	Thermal & Moisture Protection Total			54,620.94	70,430.25				125,051.19
9	Finishes								
9205530	Furring, walls, on steel, galv., 1-5/8" channels, 24" O.C.	86,893.00	SF	126,842.93	22,043.02				148,885.94
	Finishes Total			126,842.93	22,043.02				148,885.94
	Grand Total			1,081,023.65	666,436.29				1,747,459.94

Notes

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Division - Details (8" CMU Construction)

Monday, April 19, 2010

6:31:08 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Total	Mat Total	Subs Total	Equip Total	Other Total	Grand Total
4	Masonry								
4810184	Concrete block, exterior, tooled joints both sides, normal weight, 2000 psi, 8" x 8" x 16", includes mortar and horizontal joint reinforcing every other course, excludes scaffolding, grout and vertical reinforcing	86,893.00	SF	575,362.00	459,170.42				1,034,532.42
	Masonry Total			575,362.00	459,170.42				1,034,532.42
7	Thermal & Moisture Protection								
7210900	Extruded polystyrene insulation, rigid, for walls, 25 PSI compressive strength, 1" thick, R5	86,893.00	SF	49,939.14	49,925.24				99,864.39
7210900	Wall Insulation, Rigid, expanded polystyrene, 2" thick, R7.69	86,893.00	SF	54,620.94	70,430.25				125,051.19
	Thermal & Moisture Protection Total			104,560.08	120,355.49				224,915.58
9	Finishes								
9205530	Furring, walls, on steel, galv., 1-5/8" channels, 16" O.C.	86,893.00	SF	161,680.07	32,277.27				193,957.34
	Finishes Total			161,680.07	32,277.27				193,957.34
	Grand Total			841,602.15	611,803.19				1,453,405.34

Notes

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Division - Details (Structural Steel frame with 6" metal stud infill framing)

Monday, April 19, 2010

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CSI	Item Description	Takeoff Qty	Unit	Labor Total	Mat Total	Subs Total	Equip Total	Other Total	Grand Total
5	Metals								
5120680	Structural steel project, apartment, nursing home, etc, 100-ton project, 1 to 2 stories, A992 steel, shop fabricated, incl shop primer, bolted connections	160.5	ton	99,665.52	370,919.51		30,403.68		500,988.71
5410400	Partition, galv LB studs, 18 ga x 6" W studs 16" O.C. x 8' H, incl galv top & bottom track, excl openings, headers, beams, bracing & bridging	10,861.00	LF	157,331.36	115,925.97				273,257.33
	Metals Total			256,996.88	486,845.48		30,403.68		774,246.04
6	Wood & Plastics								
6160800	Sheathing, gypsum, weatherproof, 1/2" thick	86,893.00	SF	81,049.45	39,706.63				120,756.07
	Wood & Plastics Total			81,049.45	39,706.63				120,756.07
7	Thermal & Moisture Protection								
7210900	Extruded polystyrene insulation, rigid, for walls, 25 PSI compressive strength, 2" thick, R10	86,893.00	SF	54,620.94	101,633.53				156,254.47
7210950	Blanket insulation, for walls or ceilings, kraft faced fiberglass, 6" thick, R19, 15" wide	86,893.00	SF	29,651.37	41,901.54				71,552.91
7260100	Vapor Retarders, building paper, housewrap, exterior, spun bonded polypropylene, large roll	86,893.00	SF	10,143.89	12,481.31				22,625.20
	Thermal & Moisture Protection Total			94,416.20	156,016.38				250,432.58
	Grand Total			432,462.53	682,568.49		30,403.68		1,145,434.69

Notes

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Labor Details (8" ICF Construction)

Tuesday, April 20, 2010

7:55:17 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Mix	Labor Prod	Labor \$/Unit	Labor Hours	Labor Rate	Labor Total
3110460	C.I.P. concrete forms, insulating, left in place, 8" wall, straight block, 16" x 48" (5.33 SF), S.F. is for exterior face, but includes forms for both faces (total R22)	16,334.00	EA	CARP2	0.1764	11.42	2,881.70	64.75	186,604.52
3210600	Reinforcing Steel, in place, walls, #3 to #7, A615, grade 60, incl labor for accessories, excl material for accessories	105	ton	RODM4	10.809	755.51	1,134.90	69.9	79,328.03
3310700	Structural concrete, placing, walls, pumped, 8" thick, includes strike off & consolidation, excludes material	2,121.00	CY	C20	0.6448	35.85	1,367.50	55.59	76,027.46
	Grand Total						5,384.20		341,960.00

Notes

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Labor Details (12" Split Face Decorative CMU Construction)

Tuesday, April 20, 2010

7:57:36 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Mix	Labor Prod	Labor \$/Unit	Labor Hours	Labor Rate	Labor Total
4810182	Concrete block, decorative, split face or scored split face, 2000 psi, 12" x 8" x 16", excludes scaffolding, grout and reinforcing	86,893.00	SF	D9	0.1777	10.35	15,437.50	58.27	899,559.78
7210900	Wall Insulation, Rigid, expanded polystyrene, 2" thick, R7.69	86,893.00	SF	CARP	0.0109	0.63	949.7	57.52	54,620.94
9205530	Furring, walls, on steel, galv., 1-5/8" channels, 24" O.C.	86,893.00	SF	LATH	0.0261	1.46	2,270.20	55.87	126,842.93
	Grand Total						18,657.40		1,081,023.65

Notes

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Labor Details (8" CMU Construction)

Tuesday, April 20, 2010

7:53:43 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Mix	Labor Prod	Labor \$/Unit	Labor Hours	Labor Rate	Labor Total
4810184	Concrete block, exterior, tooled joints both sides, normal weight, 2000 psi, 8" x 8" x 16", includes mortar and horizontal joint reinforcing every other course, excludes scaffolding, grout and vertical reinforcing	86,893.00	SF	D8	0.1112	6.62	9,666.40	59.52	575,362.00
7210900	Extruded polystyrene insulation, rigid, for walls, 25 PSI compressive strength, 1" thick, R5	86,893.00	SF	CARP	0.01	0.57	868.3	57.52	49,939.14
7210900	Wall Insulation, Rigid, expanded polystyrene, 2" thick, R7.69	86,893.00	SF	CARP	0.0109	0.63	949.7	57.52	54,620.94
9205530	Furring, walls, on steel, galv., 1-5/8" channels, 16" O.C.	86,893.00	SF	LATH	0.0333	1.86	2,893.80	55.87	161,680.07
	Grand Total						14,378.10		841,602.15

Notes

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Labor Details (Structural Steel frame with 6" metal stud infill framing)

Tuesday, April 20, 2010

7:58:48 PM

CSI	Item Description	Takeoff Qty	Unit	Labor Mix	Labor Prod	Labor \$/Unit	Labor Hours	Labor Rate	Labor Total
5120680	Structural steel project, apartment, nursing home, etc, 100-ton project, 1 to 2 stories, A992 steel, shop fabricated, incl shop primer, bolted connections	160.5	ton	E5	7.7851	620.97	1,249.50	79.76	99,665.52
5410400	Partition, galv LB studs, 18 ga x 6" W studs 16" O.C. x 8' H, incl galv top & bottom track, excl openings, headers, beams, bracing & bridging	10,861.00	LF	CARP2	0.2233	14.49	2,424.90	64.88	157,331.36
6160800	Sheathing, gypsum, weatherproof, 1/2" thick	86,893.00	SF	CARP2	0.0142	0.93	1,234.50	65.65	81,049.45
7210900	Extruded polystyrene insulation, rigid, for walls, 25 PSI compressive strength, 2" thick, R10	86,893.00	SF	CARP	0.0109	0.63	949.7	57.52	54,620.94
7210950	Blanket insulation, for walls or ceilings, kraft faced fiberglass, 6" thick, R19, 15" wide	86,893.00	SF	CARP	0.0059	0.34	515.5	57.52	29,651.37
7260100	Vapor Retarders, building paper, housewrap, exterior, spun bonded polypropylene, large roll	86,893.00	SF	CARP	0.002	0.12	176.4	57.52	10,143.89
	Grand Total						6,550.50		432,462.53

Notes

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Energy Consumption Forecast

Investment	Est. Energy Cost (Conv.)	Est. Cost (ICF)	Energy Savings(Yr)	Cost of Capital	Cashflow Savings	Yearly Cashflow	Accum Cashflow	Cashflow (5 Yr. Inc.)
FY 1	170,769.63	75,346.77	(95,422.85)	-	(95,422.85)	95,422.85	95,422.85	
FY 2	180,960.50	79,843.18	(101,117.32)	-	(101,117.32)	101,117.32	196,540.18	
FY 3	191,759.53	84,607.92	(107,151.62)	-	(107,151.62)	107,151.62	303,691.80	
FY 4	203,203.01	89,656.99	(113,546.02)	-	(113,546.02)	113,546.02	417,237.81	
FY 5	215,329.39	95,007.38	(120,322.01)	-	(120,322.01)	120,322.01	537,559.82	537,559.82
FY 6	228,179.42	100,677.06	(127,502.37)	-	(127,502.37)	127,502.37	665,062.19	
FY 7	241,796.30	106,685.08	(135,111.22)	-	(135,111.22)	135,111.22	800,173.41	
FY 8	256,225.77	113,051.63	(143,174.14)	-	(143,174.14)	143,174.14	943,347.55	
FY 9	271,516.35	119,798.12	(151,718.22)	-	(151,718.22)	151,718.22	1,095,065.77	
FY 10	287,719.40	126,947.22	(160,772.19)	-	(160,772.19)	160,772.19	1,255,837.96	718,278.14
FY 11	304,889.40	134,522.94	(170,366.46)	-	(170,366.46)	170,366.46	1,426,204.42	
FY 12	323,084.03	142,550.76	(180,533.27)	-	(180,533.27)	180,533.27	1,606,737.69	
FY 13	342,364.45	151,057.64	(191,306.81)	-	(191,306.81)	191,306.81	1,798,044.50	
FY 14	362,795.45	160,072.18	(202,723.27)	-	(202,723.27)	202,723.27	2,000,767.77	
FY 15	384,445.69	169,624.68	(214,821.02)	-	(214,821.02)	214,821.02	2,215,588.78	959,750.82
FY 16	407,387.94	179,747.23	(227,640.71)	-	(227,640.71)	227,640.71	2,443,229.50	
FY 17	431,699.29	190,473.85	(241,225.44)	-	(241,225.44)	241,225.44	2,684,454.94	
FY 18	457,461.45	201,840.60	(255,620.85)	-	(255,620.85)	255,620.85	2,940,075.79	
FY 19	484,761.00	213,885.68	(270,875.32)	-	(270,875.32)	270,875.32	3,210,951.11	
FY 20	513,689.69	226,649.56	(287,040.13)	-	(287,040.13)	287,040.13	3,497,991.24	1,282,402.45
Total Additional Cashflow (20 Yr)						3,497,991.24		
Total Energy Savings (20 Yr)						3,497,991.24		
NPV Of Investement						\$1,629,207.14		
IRR						N/A		

Notes:

Energy consumption based upon Energy Wise Consumption Projection Dated March 10, 2010 using an average of 6 similar projects located in MN, ICF Exterior Wall construction and other Energywise construction recommendations.

Energy forecasts based upon data provided by US Department of Energy through December 2009

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Comparitive Projects Energy Analysis

Minneapolis, MN	Conditioned SF	Estimated Monthly HVAC Consumption (Monthly)					% Savings
		Conventional Built	Cost/SF	Energy Wise	Cost/SF	Net Savings	
Ben Bolt Service Center	1,800	\$ 179.00	0.0994	\$ 86.00	0.0478	\$ 93.00	51.96%
Union Missionary Church	8,640	\$ 835.00	0.0966	\$ 315.00	0.0365	\$ 520.00	62.28%
Pro Motion Physical Therapy	3,031	\$ 317.00	0.1046	\$ 158.00	0.0521	\$ 159.00	50.16%
New Life Dorm	7,000	\$ 714.00	0.1020	\$ 340.00	0.0486	\$ 374.00	52.38%
Hospice House West	37,331	\$ 3,561.00	0.0954	\$ 1,337.00	0.0358	\$ 2,224.00	62.45%
Eubanks Pharmacy	6,500	\$ 647.00	0.0995	\$ 279.00	0.0429	\$ 368.00	56.88%
Average			0.0996		0.0439		56.02%
Subject Project SF	142,879						

Notes

Energy analysis completed using attached Energy Wise consumption reports located in Minneapolis, MN, ICF exterior wall construction, and other Energy Wise construction recommendations.

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