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CANADA MORTGAGE AND HOUSING CORPORATION
HOUSING CONSTRUCTION COST COMPARISON IN EXPORT MARKETS
(*RESIDENTIAL HOUSING STUDY*)

VOLUME 2 - TRADITIONAL HOUSE INFORMATION
FINAL REPORT

FEBRUARY 2003

Hanscomb

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VOLUME 2 - TRADITIONAL HOUSE INFORMATION
FINAL REPORT

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1. STUDY BACKGROUND

In the Spring of 2000 Hanscomb Limited was commissioned by the Research Division of Canada Mortgage and Housing Corporation (CMHC) to develop a construction cost database/spreadsheet for twelve countries to enable CMHC to compare the cost of house construction in these priority export markets.

The countries, which were to be compared against Canada as the base country, were Chile, China, France, Germany, Japan, Poland, Russia, South Korea, Spain, United Kingdom and United States of America with all material and labour costs were priced locally.

A second objective was to prepare a presentation package designed to communicate the findings of the project in a clear and concise manner. We believe Volume 1 of this presentation (Executive Summary) satisfies this objective.

NOTICE TO READER

The information contained under 'Volume 3' and 'Volume 4' is as received from the local contacts. Hanscomb has purposely not altered the responses received - including information the remarks column - unless a correction was needed to a rate. The remarks listed are mainly those entered by the local consultants. In no case has the information listed under the 'Description' column been altered (see sections '5.1 Standardization' and '5.7 Data Collection', under 'Volume 1 - Executive Summary'. Also of interest in Volume 1 would be 'Appendix A - Base Case Bill of Quantities, Plans & Specifications'.)

The reader should refer to the tables titled 'Exhibit E', contained under each country section of Volume 1 - Executive Summary', for a summary of the main difference between the base case 'wood frame' house and the locally priced 'wood frame' house as highlighted by the local consultant.

2. TRADITIONAL HOUSE COSTS

2.1 Introduction

This document contains the details of traditional houses and their costs for each of the eleven countries studied under this mandate. The purpose of this exercise is to compare the cost of these country traditional houses against a Canadian Baseline Cost (Wood Frame Construction) which could be built in each respective country. It is assumed that each of the houses studied would accommodate a "typical" middle class family unit in that country.

The objective of this exercise is to determine whether an export opportunity exists in each country for Canadian materials, systems or components, as a parallel substitute to local construction using traditional methods.

A number of pages in Volume 2 were provided by the Country Consultants in hard copy format. In order to identify these pages, they have been inserted without the report header and footer.

2.2 Baseline House

The terms of reference for this study defines the 'Base Case' as the "Canadian Wood Frame Construction". The Baseline House presented is a 100m2 detached unit with an unfinished basement which occupies the same area but not included in the above space calculation. The plans and sections of this house are included in appendix A to Volume 1, together with CMHC Base Case Bill of Quantities.

2.3 Gross Floor Area

In Canada, when expressing the area of a house with respect to cost, the basement area is not usually included in the calculation. Thus, on a cost per m2 basis, the cost of the basement is included in the overall cost of the house, but not included in the area.

2.4 Comparison of Canadian Baseline Costs with Country Traditional House Costs

Because of this method of cost calculation, difficulty arises when comparing the cost of country traditional houses where basements do not exist. In fact, for the country houses studied very few countries customarily build basements (USA possibly and Germany where the basement is optional).

Also the houses studied were either one storey or two storey, each without a basement.

2. TRADITIONAL HOUSE COSTS (cont'd)

2.5 Basis for Cost Comparison

In order to make sensible comparison the Canadian Baseline House cost was theoretically recalculated by eliminating the basement and assuming:

(i) The 100m2 housing unit was built on grade as a single storey, and
(ii) The 100m2 housing unit was built on grade but with two storeys, 50m2 for each floor.

2.6 Cost Calculations

Section 5.8 of Volume 1 provides details of the cost calculations for the 100m2 theoretical housing units listed in the following table, in summary we find:

Description	Cost (CAD)	$/m2	Ratio to Baseline
Base Case – Wood Frame with Basement	$85,267	$852.67	1.00
One Storey, excluding basement	$75,714	$757.14	0.89
Two Storey, excluding basement	$70,594	$705.94	0.83

The resulting 'ratio to baseline' adjustment factors were generated from adjustments made to the Canadian 'traditional' house (the 'wood frame' house outlined under section 5.5 on page 11 of 'Volume 1').

These adjustment factors allow a better comparison between a country's 'traditional' house (which for example typically did not include a basement) and the locally priced 'wood frame' house (which for example included a basement as per CMHC specification document). The resulting comparison is included in an attempt to capture the 'flavour' for comparable construction within a given country.

No adjustments were made to the detailed information received from the consultants.

No factors were necessary when comparing the locally priced 'wood frame' house to the 'wood frame' house priced in Toronto (benchmark) as all the consultants priced a similar house in terms of building area, presence of a basement and the number of storeys (as per CMHC baseline specification document)

.

2. TRADITIONAL HOUSE COSTS (cont'd)

2.7 Methodology for Cost Comparison of Baseline versus Traditional

As noted above costs for:

(i) The Single storey excluding basement is 89% of Baseline.
(ii) The Two storey excluding basement is 83% of Baseline.

For the traditional houses in each of the countries studied the following approach has been adopted, depending on whether the house is one storey, two storey, with or without a basement.

A. The total construction cost in its local currency expressed as a cost/m2 based on the area calculation. This cost is converted to Canadian equivalent dollars at the conversion rate ruling at study date. (see Volume 1, Item). The results can be found in the following table:

Country	GFA (m2)	Amount	Rate (per m2)	Conversion to CAD	Rate (CAD/m2)
Chile	100.00	27,081,509 CLP	270,815 CLP	0.0026180	709
China	100.00	429,250 CNY	4,292 CNY	0.1777470	763
France	123.00	458,521 FRF	3,728 FRF	0.1991470	742
Germany	124.70	263,250 DEM	2,111 DEM	0.6679070	1,410
Japan	118.00	21,445,616 JPY	181,743 JPY	0.0137960	2,507
Poland	119.70	76,152 USD	636 USD	1.4715000	936
Russia	219.20	98,824 USD	451 USD	1.4715000	663
South Korea	110.00	90,505,622 KRW	822,778 KRW	0.0013270	1,092
Spain	152.00	9,754,842 ESP	64,177 ESP	0.0078510	504
UK	131.76	97,800 GBP	742 GBP	2.1319090	1,582
USA	169.00	107,133 USD	634 USD	1.4715000	933

B. Comparative cost/m2 of Equivalent Canadian wood frame built in Canada. ie:
- One storey with basement $852.67/m2
- One storey no basement $757.14/m2
- Two storey no basement $705.94/m2

C. Cost of Canadian Wood Frame House with basement built in country studied. These figures from Case A Wood frame studies.

D. Equivalent Cost of Canadian Wood Framed House, built in that country for either option:
- One Storey no basement 89% of C
- Or, Two Storey no basement 83% of C

2. TRADITIONAL HOUSE COSTS (cont'd)

2.7 Methodology for Cost Comparison of Baseline versus Traditional (cont'd)

E. Country Traditional House – This is the local cost calculated in A and by direct comparison with D it can be determined whether the Canadian House using Canadian components is more or less expensive to construct than the country traditional equivalent of the same design.

F. Cost of Complete 100m2 Traditional House

2.8 Cost Analysis

For consistency, the cost analysis of each traditional house in export countries is calculated by the above approach (ie: A to F).

2.9 Conclusions

By analysis of the Case A studies it is possible to identify the relative costs of materials and systems to each country, however by analysis of these Case B studies it may be possible to identify a higher potential export opportunity if a Canadian product can be built at lesser cost than the local traditional equivalent.

Report Navigation

Hanscomb

1. CANADA

3. COUNTRY TRADITIONAL HOUSES

3.1 Canada Traditional House

This is Canadian Wood Frame House (Case ‘A’ Studies) see Volume 3 Tab 1.

2. CHILE

3. COUNTRY TRADITIONAL HOUSES

3.2 Chile Traditional House

Introduction

The following provides an analysis of a typical Chilean House built in Santiago suburbs. The size is similar to the Canadian baseline house 100m2 single storey, excluding basement. The information provided includes:

1. Description of Typical Chilean House
2. Outline Specification
3. Trade Breakdown

*No plans were provided

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost
100m2 @ 270,815 CLP/m2 = CLP 27,081,510
= CAD 709.00/m2 (0.0026180)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
(Single storey, no basement)
(Refer to Methodology) = CAD 757.00/m2

C) Cost of Canadian Wood Frame
House with basement, built in Chile
(Refer to Methodology) = CAD 934.18/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian Wood
Framed House, single storey no basement
[89% of above](Refer to Methodology) = CAD 831.42/m2

E) Chile Traditional House,
single storey, no basement (from A above) = CAD 709.00/m2

F) Cost of Complete Chilean Traditional
house (single storey, no basement) = CAD 70,900

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.2 Chile Traditional House (cont'd)

Traditional Chilean House Description

The following provided by our Chilean consultant:

A traditional Chilean house consists on a one storey 100 m2 building, without a basement, with the following outline specifications.

Program:

- 3 bedrooms
- one and ½ bathrooms (one full 3 piece, the other with a shower stall)
- one living room with a fireplace
- dining room connected to the living room and to the kitchen
- kitchen without eating in, with a laundry corner
- patio
- no garage, a small utility room in a garden corner (items not considered in study)
- heavy fence or high wall around the lot perimeter (not considered in our study)

In cases where a large family needs a living-in nanny, an addition of a small bedroom and ½ bathroom is added on close to the kitchen area. This was not considered in our study.

Materials:

- Foundation: concrete strip footings
- Floor: slab on grade
- Walls: concrete frame with masonry infill for exterior and interior structural walls
- Interior walls: Gypsum board on steel frame (formerly was 100mm masonry)
- Roof and ceiling structure: wood trusses, similar to Canadian wood frame house

Finishes:

- Masonry walls: interior and exterior stucco and paint
- Interior walls: Gypsum board and paint
- Kitchen and bathroom walls: ceramic tile
- Ceiling: Gypsum board with textured paint
- Floors: Vinyl tile for kitchen and bathrooms; carpets on the rest
- Doors and windows: similar to Canadian wood frame house specification
- Roof finish: asphalt shingles, similar to Canadian wood frame house specification
- Electrical: similar to Canadian wood frame house specification
- Plumbing: similar to Canadian wood frame house specification
- Heating: gas furnace and water heated radiators

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.2 Chile Traditional House (cont'd)

- Specialty items: kitchen and bathroom fixtures: similar to Canadian wood frame house specification
- Mahogany bi-fold closet doors were considered, although sliding hung doors are preferred by Chilean users.
- 15m2 patio (ceramic tiles on concrete pad), no wooden deck.

Conclusion

On face value comparing D and E in the cost analysis; building a Chilean house to Canadian Standards and specifications would appear to be more costly than traditional construction however a mix between the two systems could serve as a possible solution.

Export Opportunities

The following is an excerpt from the report received from our Chilean consultant which provides favourable insight for an export potential.

"Our opinion is that there is a good chance to commercialize a product in Chile which is a mix between a Canadian and a Traditional Chilean house, with wood frame, no basement and slab on grade. There is a good market for first buyers and also for second homes (the equivalent to weekend and summer cottages in Canada). The target price is between $200.000 and $300.000 /m2, values that are quite achievable with a good Chilean design and using Canadian elements. Chilean users will be prepared to pay more for a product that is faster to build (traditional Chilean houses are slow to build), and has better quality standards in terms of materials and interior comfort."

Outline Specification

The traditional house provided to us is one storey 3 bedroom masonry construction on concrete foundations with a total gross floor area of 100m2 (note no basement).

Foundation
- Concrete footings
- Weeping tile c/w granular to outside of footing

Lowest Floor Construction
- Ground floor concrete slab 100mm thick

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.2 Chile Traditional House (cont'd)

Upper Floor Construction

Roof Construction
- Wood trusses built on site

Walls Below Grade

Walls Above Grade
- Masonry exterior walls
- Parging and damp proofing
- Stucco exterior

Windows & Entrances
- Vinyl clad wood framed sealed windows
- Insulated metal door
- Exterior patio sliding door

Roof Coverings
- Asphalt shingles roofing
- Insulation, vapour barrier and gypsum board

Projections
- Aluminium fascia and soffit
- Eaves trough and downspouts

Partitions
- Masonry infill walls
- Gypsum board wall construction

Doors
- Interior hollow core wood doors and hardware
- Bi-fold doors and hardware

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.2 Chile Traditional House (cont'd)

Floor Finish
- Carpet
- Sheet vinyl flooring
- Pre-finished clear maple flooring

Ceiling Finishes
- Textured ceiling finish
- Painted ceiling

Wall Finishes
- Paint

Fittings & Fixtures
- Mail box and house numbers
- Vanities and base cabinets in kitchen
- Upper wall cabinets and countertops
- Painted wood trim
- Attic access hatch
- Washroom accessories

Equipment
- Wood burning fireplace complete with mantel
- Central vacuum rough-in

Mechanical
- Plumbing fixtures
- Bathtubs
- Water supply and distribution
- Gas fired, 70% efficient furnace c/w filter, ductwork, etc.

Electrical
- Electrical installation
- Lighting and recessed fixtures, allowance included with total electrical

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.2 Chile Traditional House (cont'd)

Site Development
- Precast concrete steps
- Cedar deck

Mechanical Site Services

Electrical Site Services

General Requirements
- Percentage provided to us by consultant

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.2 Chile Traditional House (cont'd)

Gross Floor Area 100m2

	Item Description	Amount (CLP)	Rate/m2 (CLP)	% of Total	Notes
1	Foundations	1,150,583	11,505.83	4.2%	
2	Concrete, Steel & Formwork	1,669,746	16,697.46	6.2%	
3	Masonry	2,018,234	20,182.34	7.5%	
4	Rough Carpentry	954,661	9,546.61	3.5%	
5	Exterior Painting	272,500	2,725.00	1.0%	
6	Windows	1,289,628	12,896.28	4.8%	
7	Doors	567,609	5,676.09	2.1%	
8	Roofing	2,272,259	22,722.59	8.4%	
9	Framing Labour (Complete House)	782,000	7,820.00	2.9%	
10	Interior Partitions	646,379	6,463.79	2.4%	
11	Doors	782,964	7,829.64	2.9%	
12	Floor Covering	771,734	7,717.34	2.8%	
13	Painting & Wall Covering	1,543,570	15,435.70	5.7%	
14	Cabinets & Vanities	555,500	5,555.00	2.1%	
15	Casings, Trim & Handrails	535,135	5,351.35	2.0%	
16	Washroom Accessories	210,665	2,106.65	0.8%	
17	Specialty Items	949,427	9,494.27	3.5%	
18	Plumbing	1,458,878	14,588.78	5.4%	
19	Heating	1,703,400	17,034.00	6.3%	
20	Electrical	2,418,634	24,186.34	8.9%	
21	Deck	14,418	144.18	0.1%	
	Total Trade Cost	**22,567,924**	**225,679.24**	**83.3%**	
	Overhead, Profit & Fees 20%	**4,513,585**	**45,135.85**	**16.7%**	
	Total Construction Cost (CLP)	**27,081,509**	**270,815.09**	**100.0%**	

3. CHINA

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

Introduction

Detached houses in the range of 100m2 are very uncommon in China. Our research indicates that such accommodations for a middle class family would be contained in a low rise walk-up apartment block of three to four floors, containing six to eight units (more than four floors requires an elevator). Detached houses, however are in the range of 200 – 250m2 and generally in a higher quality of finish.

In our research, we had great difficulty in assembling realistic cost data from the marketplace, and as a result relied on our knowledge of their construction methods to create a cost model based on the 100m2 single storey detached house without a basement, having the same configuration as the Canadian baseline house, but with local materials.

The following specification was considered as being typical:

Foundation
- Concrete strip footings

Structure
- RC concrete columns and beams

Outer walls
- Brick infill
- Plaster finish, painted
- Ceramic tiles at front entrance

Roof
- Sloping concrete pitched roof
- Waterproof membrane
- Clay tiles

Windows
- Vinyl frames, single glazing

Doors
- Exterior metal
- Interior wood

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

Wall Finishes
- Plaster, paint
- Ceramic in washroom & kitchen at counters and sinks

Floor Finishes
- Wood strip
- Ceramic tiles in washrooms & kitchen
- Carpet in bedrooms

Ceiling Finish
- Plaster, paint

Plumbing
- Residential fittings

Heating
- Wall hung split unit heating/cooling

Electrical
- Residential fixtures

<u>Cost Analysis</u>

A) Total Construction Cost (Excluding VAT)
100m2 @ CNY 4,292 = CNY 429,251
= CAD 762.89/m2 (0.177747)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
[One storey, no basement](Refer to Methodology) = CAD 757.14/m2

C) Cost of Canadian Wood Frame
House with basement, built in China
(Refer to Methodology) = CAD 1,008.21 (Case A)

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

D) Adjust for Equivalent Cost of Canadian Wood Framed House built in China, no basement [89% of above](Refer to Methodology)	= CAD 897.30/m2
E) Cost of Chinese Traditional House, single storey, no basement (from A above)	= CAD 762.89/m2
F) Cost of Complete house on 100m2 Comparative basis	= CAD 76,289

Conclusion

Comparing the above figures D and E, it is noted that the Canadian Wood Framed house construction built in China is about 18% more expensive than the equivalent traditional house, particularly due to the high cost of wood and other materials.

By comparison, our research indicates that low rise apartment building construction as previously described can be constructed at even lover cost 2,000 – 2,500 RMB/m2 (CAD 355 – 440/m2)

Export Opportunities

Again, we are informed that China is reluctant by custom to change from local and traditional construction methods. "Solid" construction prevails with the humble plaster and paint finish for this level of family accommodation and the higher quality levels in larger bungalows; however there still appears to be some potential exporting initiatives. We interviewed one Canadian exporter who exported complete housing materials, including some prefabricated units (and even down to the bricks and mortar) for a sixty-house development. Cost delivered to site including packaging and freight amounted to approximately CAD 700/m2 excluding VAT and import duties, which suggests there is a market at more expensive levels, but somewhat limited. Another negative aspect is this scale of duties and taxes. With VAT at 17% and other import duties the combined effect could add 25 – 35% to the cost of materials.

Outline Specification

The traditional house provided to us is a 3 bedroom bungalow, concrete structure with a total gross floor area of 100m2. (with no basement, no garage).

Foundation

- Concrete footings

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

- Weeping tile complete with granular to outside face of footings

Basement Excavation
- No basement

Special Conditions

Lowest Floor Construction
- Ground floor concrete slab

Upper Floor Construction
- No upper floor construction
- No stairs required

Roof Construction
- Attic and roof slabs

Walls Below Grade
- Concrete foundation wall
- Parging and damp proofing

Walls Above Grade
- Face brick, batt insulation, gypsum board and exterior tile (bearing wall)

Windows & Entrances
- Vinyl clad wood windows
- Insulated metal door
- Patio sliding door

Roof Coverings
- Clay tile with waterproofing
- Insulation and plaster ceiling

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

Projections
- Prefinished perforated aluminium soffit
- Eaves trough and downspouts

Partitions
- Brick and plaster partitions (bearing wall)

Doors
- Interior hollow core wood doors and hardware
- Bi-fold closet doors and hardware

Floor Finish
- Carpet
- Sheet Vinyl
- Pre-finished clear maple

Ceiling Finishes
- Textured ceiling finish

Wall Finishes
- Paint

Fittings & Fixtures
- Mail box and house numbers
- Vanities and base cabinets in kitchen
- Upper wall cabinets and countertops
- Painted wood trim
- Attic access hatch
- Washroom accessories

Equipment
- Brick fireplace

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

Mechanical
- Plumbing fixtures
- Bathtubs
- Water supply and distribution
- Oil fired furnace and ductwork

Electrical
- Electrical installation
- Lighting and recessed fixtures

Site Development
- Precast concrete steps
- Cedar decks

Mechanical Site Services

Electrical Site Services

General Requirements
- Percentage provided to us by consultant

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.3 China Traditional House (cont'd)

Gross Floor Area 100m2 bungalow with no basement

	Item Description	Amount (CNY)	Rate/m2 (CNY)	% of Total	Notes
1	Excavation, Backfill	3,656	36.56	0.9%	
2	Concrete, Steel & Formwork	12,131	121.31	2.8%	
3	Damproofing	1,066	10.66	0.2%	
4	Exterior Masonry Wall	53,600	536.00	12.5%	(1)
5	Deck	11,081	110.81	2.6%	
6	Attic and Roof Slab (Precast Concrete)	70,000	700.00	16.3%	
7	Roofing: Clay Tile with Waterproofing	22,200	222.00	5.2%	
8	Roof Insulation and Plastered Ceiling	12,000	120.00	2.8%	
9	Windows and Exterior Doors	19,005	190.05	4.4%	
10	Soffit, Fascia and Downpipe	9,775	97.75	2.3%	
11	Interior Plastered Brick Wall	15,430	154.30	3.6%	
12	Drywall, Insulation, Caulking	11,498	114.98	2.7%	
13	Plumbing	11,110	111.10	2.6%	
14	Electrical	15,198	151.98	3.5%	
15	Heating	23,810	238.10	5.5%	
16	Specialty Items	6,400	64.00	1.5%	
17	Cabinets & Vanities	17,960	179.60	4.2%	
18	Painting	12,525	125.25	2.9%	
19	Interior Finishing, Door Casings, etc.	24,000	240.00	5.6%	
20	Floor Covering	19,200	192.00	4.5%	
	Total Trade Cost	**371,645**	**3,716.45**	**86.6%**	
	General Requirements (10%)	**37,165**	**371.65**	**8.7%**	
	Fee (5%)	**20,440**	**204.40**	**4.8%**	
	Total Construction Cost (CNY)	**429,250**	**4,292.50**	**100.0%**	

(1) Including: brick, batt insulation, gypsum board and exterior tile

4. FRANCE

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.4 France Traditional House

Introduction

Our French consultant provided us with a cost breakdown of a typical house built in the Bordeaux region, with the following characteristics.

Single storey, No basement, No garage.
Gross Floor Area 123m2
Total Cost (Excluding TVA) 458,521 FFR
Prices in Bordeaux similar to Paris suburbs.

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost
123m2 @ FFR 3,727.80/m2 = FFR 458,521
= CAD 742.38/m2 (0.199147)

B) Comparative Cost of equivalent Canadian wood frame house built in Canada (Single storey, no basement) (Refer to Methodology) = CAD 757.14/m2

C) Cost of Canadian Wood Frame House with basement, built in France (Refer to Methodology) = CAD 1,102.39/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian Wood Framed House, single storey no basement [89% of above](Refer to Methodology) = CAD 981.12/m2

E) Cost of French Traditional House, single storey, no basement (from A above) = CAD 742.38/m2

F) Cost of Complete house on 100m2 comparative basis = CAD 74,238

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.4 France Traditional House (cont'd)

Conclusions

French traditional house is less expensive than Canadian equivalent built in France for the following reasons:

1. Cost of traditional house in France is almost the same as constructing the Canadian Wood Frame house in Canada (expressed in local currency of each country).
2. Cost of Canadian Wood Framed house construction is 32% more than the traditional house in France. This is principally due to the high cost of components or systems or methods in use or applied in France. Reference should be made on comments for Wood Frame House with regard to Basement construction, Deck, Shingles, Vinyl Siding, Brickwork, Heating systems and general specification of systems.

Export Opportunities

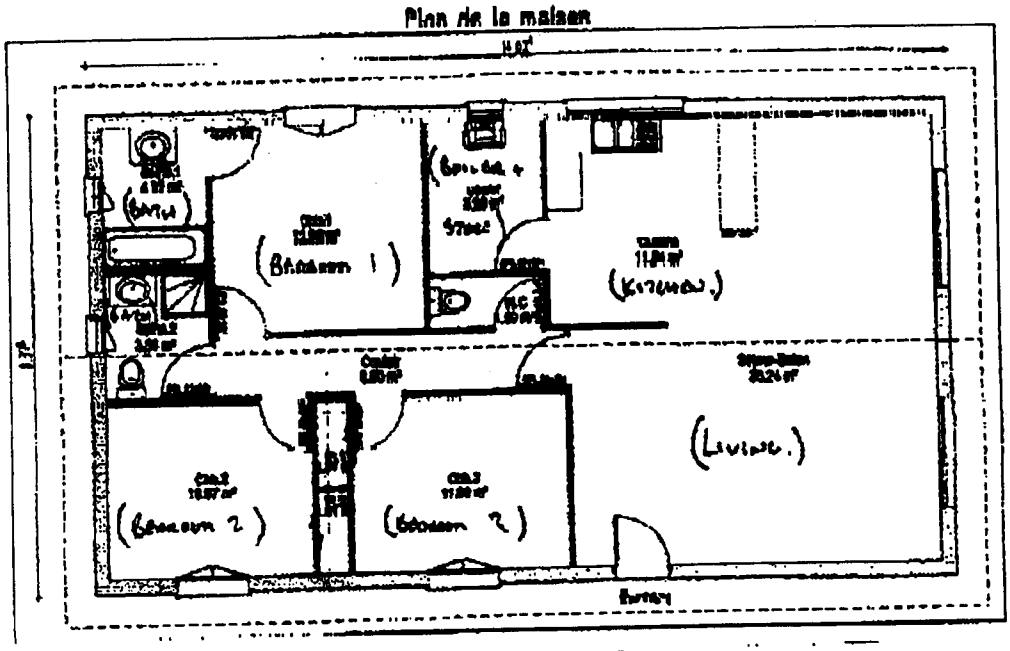
In Case A study the Canadian Wood Frame house indicated that it cost 29% more to build the same house in France. This tends to suggest that material costs are so much higher in France and an export opportunity may exist for some material products, particularly lumber.

Also we are advised in the opinion of our French Consultant that the Canadian House built as a wood framed kit house without basement, and adapted to French building methods would be approximately 5% – 10% cheaper than the French equivalent.

The prices used are for 2000 and if considered for 2003 the percentage would be higher. Since 2000 prices have increased by 25% (35 hr week, great demand/price corrections) and also the CAD/Euro exchange rate which is a significant cost difference.

Report Navigation

Plan de la maison



3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.4 France Traditional House (cont'd)

Gross Floor Area 123 m2

	Item Description	Amount (FRF)	Rate/m2 (FRF)	% of Total	Notes
1	Site Prep, Earthworks	17,481	142.12	3.8%	(1)
2	Foundations, Concrete Work	36,772	298.96	8.0%	(2)
3	Masonry	44,020	357.89	9.6%	(3)
4	Wood Frame to Roof	24,101	195.94	5.3%	
5	Roof Tiling	19,723	160.35	4.3%	(4)
6	Rainwater Goods	12,207	99.24	2.7%	(5)
7	Insulation	11,512	93.59	2.5%	(6)
8	Exterior Joinery	35,968	292.43	7.8%	(7)
9	Interior Joinery	7,308	59.42	1.6%	(8)
10	Plasterwork, Partitions	32,634	265.32	7.1%	(9)
11	Floor Finishes	22,674	184.34	4.9%	(10)
12	Wall Finishes	9,904	80.52	2.2%	(11)
13	Painting	12,423	101.00	2.7%	
14	Gas Central Heating	24,391	198.30	5.3%	(12)
15	Plumbing	21,493	174.74	4.7%	(13)
16	Electricity	20,127	163.63	4.4%	
17	Ventilation	2,777	22.57	0.6%	(14)
18	External Wall Render	13,803	112.22	3.0%	(15)
19	External Works	12,785	103.94	2.8%	(16)
	Total Trade Cost	**382,101**	**3,106.51**	**83.3%**	
	Overhead, Profit & Fees (20%)	**76,420**	**621.30**	**16.7%**	
	Total Construction Cost (FRF)	**458,521**	**3,727.81**	**100.0%**	

(1) Flat site, good soil bearing
(2) Void under suspended slab floor
(3) Excludes fireplace and chimney, cellular concrete blocks
(4) Clay tiles
(5) Zinc gutters and downpipes
(6) New government standards in 2000
(7) Wood doors and windows + shutters, double glazing
(8) Wood doors and closets
(9) Plasterboard partitions, ceilings and plaster walls
(10) Tiles wet rooms, carpet all other rooms
(11) Tiling
(12) Radiators
(13) Sanitary appliances as drawing
(14) Bathroom, WC
(15) To all external walls
(16) Excludes utility / drainage connections, top soil, paths

5. GERMANY

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.5 Germany Traditional House

Introduction

The following is an example of what is a very standard house in Germany. It is built either with or without basements. However it is very common to have basements since it is preferred to build on two floors as land costs are very high. A typical specification is also provided.

Gross Floor Area

124.7m2 (Ground Floor only) measured to outside of external walls. Basement area not included in above. (same as is Canada)

Costs

With Basement: 134,600 Euros = 263,250 DM (2,111 DM/m2)
Without Basement: 101,000 Euros = 197,536 DM (1,584 DM/m2)

Please note whilst the Euro is the only valid currency in Germany, the costs have been converted in Deutch Marks, which was the currency in existence in 2000 and for better comparison against the Wood Frame House.

Rates of Exchange

1 Euro = 1.9558 DM
1 CAD = 0.6679070 DDM

Information Provided

- Drawings and Layouts
- Outline Specification
- Total Construction Costs for both alternatives, with or without a basement

Cost Analysis (Assuming Single Storey and Basement)

A) Total Construction Cost
124.7m2 @ 2,111DM/m2 = 263,250DM
= CAD 1,409.95/m2 (0.667907)

Since there is a direct comparison with the Canadian Wood Framed house (ie: both are single storey with basement), the above figures are valid.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.5 Germany Traditional House (cont'd)

Total Cost of Traditional German House (100m2)

= CAD 140,995

B) By Comparison Total Cost of Canadian Wood Framed house built in Germany

= CAD 173,188 (Case A)

Conclusion

Canadian Wood Framed house is more expensive than the traditional German Construction.

Export Opportunities

Despite the cost variance between the Canadian Wood Frame House, and the traditional German House, we are informed by our German consultant that Germans are still very conservative with regard to private house construction – masonry houses are regarded as a better house as they are "solid" construction and this attitude makes the selling of timber houses difficult In a German market.

Also Canadian lumber would have to be pressure treated against moisture and insects to conform with local regulations.

Notes from German Consultant

- Timber houses are not common in Germany – especially not in the mass housing market.
- Houses in Germany would be constructed with masonry walls (hollow clay blocks, lightweight concrete tiles) rendered.
- The construction form is strongly governed by energy conservation regulations – for all new buildings proof must be provided of energy loss, and high standards must be met.
- It is very common to have basements and it is preferred to build on two floors as land costs are very high.
- A major point which impacts negatively on wood frame construction is the high cost of labour & risk to the General Contractor. In Germany all work done by subcontractors is on a labour and material basis. (In Canada the wood framing is usually performed on a labour only sub contract) The reason for this is the result of two factors: Contractors have to give a 5 year warranty for their work, and the fact that a person or company qualified in one particular trade may not carry out other trades, unless they use persons certified in that trade. In analysing the labour component in the following data, it is noted that 'Framing Labour' in Germany is almost three and a half times that in Canada.
- The cost of floor coverings and painting have been included in this cost exercise, however these are generally paid for directly by the home owner.

Report Navigation

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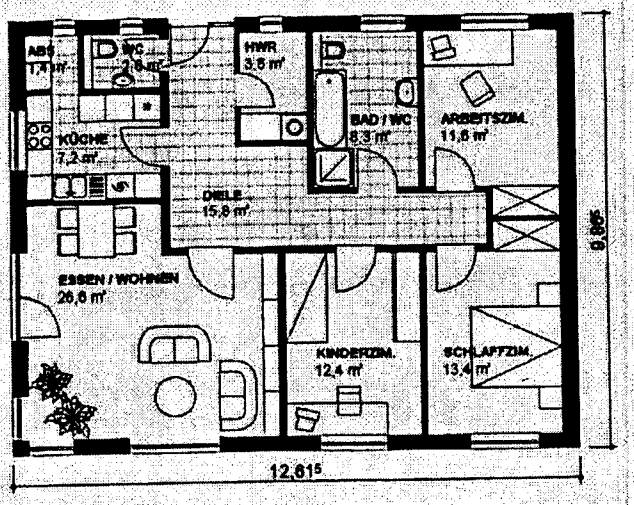
HAUS MAHLOW

WOHN- / NUTZFLÄCHE **ca 102 qm**
(DIN - Wohnfläche ca 101,7 qm)

Dachneigung 23°



ERDGESCHOSS: ca 101,7 qm

incl. Bodenplatte
incl. Brennwerttechnik
incl. Rolläden
incl. Fußbodenheizung

101.000,- €

Gültig in Verbindung mit der Leistungsbeschreibung 1 / 2003 "classic"

REGIO MASSIVHAUS, ROSCHROLER STR. 31 A, 12683 BERLIN, Tel. 030/54 99 25 0, Fax. 030/54 99 25 22

Report Navigation

REGIO-MASSIVHAUS
Boschpoler Str. 31 A, 12683 Berlin
Tel.: 030-54 99 25-0
Fax: 030-54 99 25 22

Hausprogramm

classic
comfort
Individuell

Bungalow Mahlow

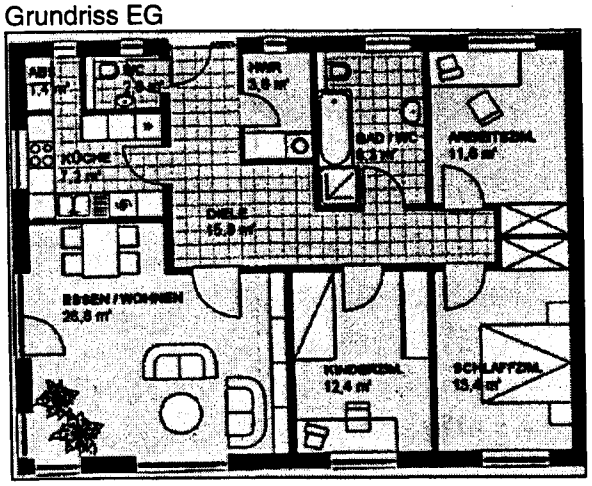
Wohn-/Nutzfläche ~ 102 m²
(DIN-Wohnfläche ~ 101,7 m²)

Dachneigung 23°

- incl. Bodenplatte
- incl. Brennwerttechnik
- incl. Rollläden
- incl. Fußbodenheizung

Preis incl. BP 101.000 €
Preis incl. Keller 134.600 €

Grundriss EG



- Essen/Wohnen 26,60 m²
- Schlafzimmer 13,40 m²
- Kinderzimmer 12,40 m²
- Arbeitszimmer 11,60 m²
- Diele 15,80 m²
- Bad 8,30 m²
- Küche 7,20 m²
- HWR 3,60 m²
- WC 2,00 m²
- Abs. 1,40 m²

Download Datenblatt (pdf-Datei 146 KB)
Baubeschreibung classic
(pdf-Datei 111 KB)

Specification „Regio Massivhaus type Classic“ Cost 134.600 Euro incl VAT at 16%

General design

- Building permit is included
- Structural calculations included
- Site layout must be provided by client

Site setup

- Placing of basement on plot by authorized landsurveyor – clients resposibility
- Other setting out by contractor
- Temporary roads not included
- Sidewalk crossing not included

Earthworks

- Excavation, deposit on site and backfill included
- Cart off site not included

Concrete works

- Basement slab executed in waterproof concrete
- Basement walls in masonry (type not specified, but usually solid calcium silicate)
- Clear height basement 2,50m
- Basement walls above ground level rendered with water resistant render
- Waterproofing of basement walls included

Walls

- Hollow clay block wall
- Clear height ground floor 2,60m
- Non load bearing internal walls lightweight masonry construction

Façade

- Rendered with 2 coat coloured smooth render

Roof construction

- Roof structure in class S10 timber, impregnated and visible parts treated with 2 coats sealer
- Roof covering in cocrete roof tiles, colour red, brown or black
- Gutters and downpipes in galvanised steel
- Roof overhang is 60 cm

Stairs

- Open stair make "Kenngott" with solid beech treads

Internal render

- All internal walls are finished ready for wall coverings

Screeds

- All rooms in the basement and ground floor have floating screed

Windows

- All windows are PVC, white, tilt & turn mechanism
- Living room with terrace door, t & t
- Window cills internally in Jura marble
- Window cills externally aluminium
- Basement windows tilt only, 50x100cm, with 8mm laminated safety glass or grilles
- Includes roller blinds to windows

Internal doors

- Internal doors hollow core, timber veneered in beech, oak or painted white

External door

- PVC door, double glazed, security lock

Tiling

- Cermaic floor tiling in entrance lobby, corridor, Kitchen, bathroom, plant room, basement lobby
- Bathroom and WC walls tiled door height
- Tiles can be selected as per samples to a value of 15 Euro/m2 incl VAT

Plumbing installation

- Sewer pipes in PVC
- Water pipes in copper or pvc multilayer incl all necessary insulation
- Washing machine water and drain connection in basement
- Cold water supply for heating plant
- Cold water supply connection for dishwasher in kitchen
- Frost proof external water tap provided
- Water filter included
- Water system with circulation pump, timer and ring system

Sanitaryware

- White fittings, chrome taps
- Bath 170x75cm, steel, incl mixer/shower, shower curtain
- WC with concealed cistern

Heating

- Heating plant with 120 liter storage tank
- Heat distribution with underfloor heating, electronically controlled room by room

Electrical

- Complete electrical system, no light fittings

Excluded

- Internal painting
- Floor coverings
- Disposal of rubbish

6. JAPAN

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House

Introduction

The traditional house provided by our Japanese consultant is a two storey, 2-bedroom softwood construction, on concrete block foundations, with no basement. The gross floor area is 118m2 on two floors. The pages which follow include the following:

1. Description of Building
2. Outline Specification
3. Trade Cost Breakdown

*No plans were provided

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost
118m2 @ JPY181,742 = JPY 21,445,616
= CAD 2,507/m2 (0.0137960)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
[Two storey, no basement](Refer to Methodology) = CAD 705.94/m2

C) Cost of Canadian Wood Frame
House with basement, built in Japan
(Refer to Methodology) = CAD 3,012.11/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian Wood
Framed House, 2 storey no basement
[83% of above](Refer to Methodology) = CAD 2,499/m2

E) Japan Traditional House,
2 storey, no basement (from A above) = CAD 2,507/m2

F) Cost of Complete house on
100m2 Comparative basis = CAD 250,732

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House (cont'd)

Conclusion

Comparing the above figures D and E is can be seen that Canadian Wood Frame construction for a similar two storey, no basement house is marginally cheaper than the traditional wood frame house in Japan.

Outline Specification

The traditional house provided to us is a two storey 2 bedroom softwood construction on concrete block foundations with a total gross floor area of 117m2 (note no basement).

Foundation

- Excavation & backfilling ground floor and footing
- Hardcore filling
- Simple wall continuous footing reinforced concrete
- Isolated footing
- Damp proof concrete including damp proof sheet

Basement Excavation

- N/A

Special Conditions

Lowest Floor Construction

- Ground floor concrete slab
- Cement screed for ground floor

Upper Floor Construction

- Staircase with balustrades
- Wooden flooring
- Thermal insulation
- Prevention of timber decay and ants

Roof Construction

- Roof and sheet metal work, asbestos cement roofing including roofing base

Walls Below Grade

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House (cont'd)

Walls Above Grade

- Structural framing (including columns, beams, wall and floor framing, studs, plates, sills and plywood etc.)
- Fittings Carpenter (labour fee)
- Exterior finished and plaster work
- Thermal insulation
- Concrete wall 120mm thick

Windows & Entrances

- Sliding aluminium window sashes with glazing, complete unit installed
- Fixed light of swing windows with glazing, complete unit installed at first floor
- Fixed light of swing windows with glazing, complete unit installed at second floor
- Exterior doors

Roof Coverings

- Flashing
- Ridge
- Roof guard

Projections

- Eaves gutter
- Down spouts
- Box gutter
- Porch and stair framing, includes balustrade, stair treads, decking joints, beams and stringers
- Balcony

Partitions

- Gypsum board wall construction
- Fittings carpenter (labour fee)

Doors

- Hinged doors, hollow core, flush face wood
- Sliding door, hollow core flush wood
- Sliding door Japanese room flush face paper surface
- Two leaf bi-folding door

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House (cont'd)

Floor Finish
- Vinyl chloride sheet
- Porcelain tile
- Porcelain tile to skirting
- Tatami floor

Ceiling Finishes
- Vinyl covering

Wall Finishes
- Vinyl wall covering
- Semi-porcelain tile
- Caulking edge of tile around sink
- Painting

Fittings & Fixtures
- Kitchen sink and cabinet with countertop
- Cupboard (kitchen)
- Bath unit includes bath tub and fittings
- Shoe racks
- Paper holder for toilet
- Towel rail
- Wash basin, cabinet and counter

Equipment

Mechanical
- Water supply pipe and fittings
- Hot water supply pipe and fittings
- Drainage pipe and fittings
- Connection to bath, wash basin and kitchen sink
- Mixing faucet for kitchen sink
- Western style water closet
- Universal faucet
- Hot water supply boiler

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House (cont'd)

Electrical
- Light fixtures
- Outlets (lighting and receptacles)
- Communications (TV, telephone, interphone)
- Switchboard
- Connection to main electricity supply
- Mechanical ventilation fan

Site Development
- Site expenses

Mechanical Site Services

Electrical Site Services

General Requirements
- Percentage provided to us by consultant

<u>Differences Between Japanese/Canadian House Cost</u>

Basement cost

In Japan, basement construction for housing is not common yet and generally more costly than typical Japanese non-basement house.

This is due to the following reasons:

- In basement construction, generally shoring for earthwork support is required and usually open-cut excavation cannot be done as land area is very limited and often site is in close proximity to neighbourhood land/building.
- Cart away excavated material / tipping cost is quite expensive compared with other countries.
- Damp waterproof cost is also quite costly.
- Temporary cost, such as safety requirement (temporary hoarding) and dewatering etc. is also required by Japanese construction code and which affect cost too.
- Concrete structure is much more expensive than wooden structure.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House (cont'd)

Frame cost

In general 2x4 wooden construction cost is higher than Japanese traditional wooden house as more volume of lumber and plywood is required.

Export Opportunities

In the opinion of our Japanese consultant there is a potential opportunity for exporting material from Canada as there is the following trend in Japan:

1. Importing lumber cost is lower than in recent years (probably due to the change of exchange rate of Japanese currency).
2. Labour cost in Japan has gone up rapidly in the last 20 years due to the labour shortage in construction industry, making prefabricated units a viable option.

Report Navigation

Typical Single House Model (Japan)

Floor Area

1 F	:	62.93
2 F	:	55.06
Total Floor Area	:	117.9

Construction Site : Tokyo

Exterior Finnish

Foundation	:	Reinforced concrete continuous footing, brushing mortar above ground, air inlet opening for natural ventilation purpose.
Roof	:	Asbestos cement roofing
Exterior Wall	:	Siding
External opening	:	Entrance door/ with aluminum sash frame and vinyl sheet surface, Window/ aluminum sash with glazing

Interior Finishes

Rooms	Floor	Skirting	Wall	Ceiling	Note
Entrance hall	Porcelain tile	Porcelain tile	Vinyl wall covering	Vinyl wall covering	Shoes racks
Corridor	Wood flooring board (12mm thick)	Lauan board	Vinyl wall covering	Vinyl wall covering	
Living & Dining room	Wood flooring board (12mm thick)	Lauan board	Vinyl wall covering	Vinyl wall covering	
Kitchen	Wood flooring board (12mm thick)	Lauan board	Vinyl wall covering (Partly porcelain tile)	Vinyl wall covering (Noncombustible type)	Cooker hood with ventilation equipment, cupboard, kitchen sink, cabinet with countertop
Dressing room (lavatory)	CF sheet Vinyl chloride sheet	Vinyl skirting	Vinyl wall covering	Vinyl wall covering	Wash basin, vanity cabinet & counter
Bath room	Unit type plastic bath floor	Tiling	Tiling	Cement board (Noncombustible type)	Bath tub, gas hot water supply boiler system
Toilet	Wood flooring board (12mm thick)	Lauan board	Vinyl wall covering	Vinyl wall covering	Water closet
2F hall	Wood flooring board	Lauan board	Vinyl wall covering	Vinyl wall covering	
Western Room	Wood flooring board	Lauan board	Vinyl wall covering	Vinyl wall covering	
Japanese Room	Tatami Mat	Wood baseboard	Wall covering		
Closet	Wood flooring board (12mm thick)	Lauan board	Vinyl wall covering	Vinyl wall covering	

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.6 Japan Traditional House (cont'd)

Gross Floor Area		
	1st Floor	62.93m2
	2nd Floor	55.06m2
		117.99m2 (say 118m2)

	Item Description	Amount (JPY)	Rate/m2 (JPY)	% of Total	Notes
1	Temporary Works	760,195	6,442.33	3.5%	
2	Foundation Work	988,660	8,378.47	4.6%	
3	Carpentry Works	6,304,670	53,429.41	29.4%	
4	Roof and Sheet Metal Work	763,270	6,468.39	3.6%	
5	Doors & Windows	1,559,300	13,214.41	7.3%	
6	Ext. Finish & Plaster Works	1,104,120	9,356.95	5.1%	
7	Interior Finishes	1,084,630	9,191.78	5.1%	
8	Equipment & Fittings	1,566,000	13,271.19	7.3%	
9	Miscellaneous Works	353,970	2,999.75	1.7%	
10	Electrical Installation	964,700	8,175.42	4.5%	
11	Plumbing & Drainage Works	1,056,000	8,949.15	4.9%	
12	Design & Permit	1,980,662	16,785.27	9.2%	
13	Site Expenses	1,650,552	13,987.73	7.7%	
	Total Trade Cost	**20,136,729**	**170,650.25**	**93.9%**	
	General Overhead & Profit (6.5%)	**1,308,887**	**11,092.27**	**6.1%**	
	Total Construction Cost (JPY)	**21,445,616**	**181,742.51**	**100.0%**	

7. POLAND

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.7 Poland Traditional House

Introduction

The pages which follow provide an analysis of a typical Polish house built in Warsaw designed to suit a middle income family. This information includes:

1. Drawings, Plans & Sections
2. Breakdown of Gross Floor Area
3. Brief Outline Specification
4. Detailed Construction Cost Estimate

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost (excluding VAT)
119.7m2 @ USD 636.18/m2 = USD 76,151
= CAD 936.14/m2 (1.471500)

B) Comparative Cost of equivalent Canadian House built in Canada. [Two storey, no basement](Refer to Methodology) = CAD 705.94/m2

C) Cost of Canadian Wood Frame House with basement, built in Poland (Refer to Methodology) = CAD 992.16/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian Wood Framed House, 2 storey no basement, built in Poland [83% of above] (Refer to Methodology) = CAD 823.49/m2

E) Polish Traditional House Cost [2 storey no basement] (from A above) = CAD 936.14/m2

F) Cost of Complete Polish Traditional House on a 100m2 comparative basis = CAD 93,614

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.7 Poland Traditional House (cont'd)

Conclusion

Comparing D and E above it is noted that the Canadian Wood Framed House built in Poland is approximately 12% less expensive than the equivalent Polish traditional house.

Export Opportunities

Given the above results, it is meaningful to note that an export potential exists particularly for packaged frame construction where speed of erection is the keynote and where skilled labour is at a premium.

Report Navigation

POLISH TRADITIONAL HOUSE

2 STOREYS (NO BASEMENT)

Report Navigation

Brief Outline Specification

Polish Traditional House

February 2003

Number of houses:	20 to 50 constructed at a time.
Location:	Warsaw and suburbs
Excavation:	Removing of top soil. Backfill is native earth, surplus amount to be used for rise the ground level around building or to landscape adjusted plot.
Foundations:	Strip foundations made of reinforced concrete. Foundation walls made of concrete block and thermally insulated (styropor)
Slab on grade:	80mm thick on granular fill, thermally insulated, waterproof isolation (bituminous felt) and screed.
Load bearing walls:	Ceramic hollow blocks, perimeter thermally insulated styropor with acrylic plaster.
Partitions:	Solid brick walls 12cm thick.
Slab:	Mainly r.c. Teriva system slab with prefabricated beams and hollow block in situ topping. In situ r.c. Slab only locally due to difficulty in using modular system and for stairs and balcony structure.
Roof :	Structure- timber, covering: cement shingles, thermal insulation- mineral wool 15cm, bottom finish- painted gypsum board.
Wall finishes:	Mainly painted lime-cement plaster. In wc and bathroom wall tilling.
Floor finishes:	Rooms- varnished oak parquet (22mm). Hall, wc and bathroom- floor tiling. Garage- paint.
Soffit finish:	Painted lime- cement plaster.

Report Navigation

Brief Outline Specification

Polish Traditional House

Doors:	hollow core, varnished, oak veneer.
Windows:	Timber, varnished, double glazed (U value for glass- 1,1)
External works:	Stairs, terrace and hard stand in front of garage- 6cm concrete blocks
Electrical Installation:	Light fixtures excluded.
Heating:	Gas furnace- dual function (hot water and process water for radiators) Steel radiators
Plumbing:	basic equipment of wc and bathroom
Notes:	There is no basement in the building. Any work not relating directly to building contruction like ultilities conncetions, local roads or fouth paths, fencing or external lighting WAS NOT taken under consideration.

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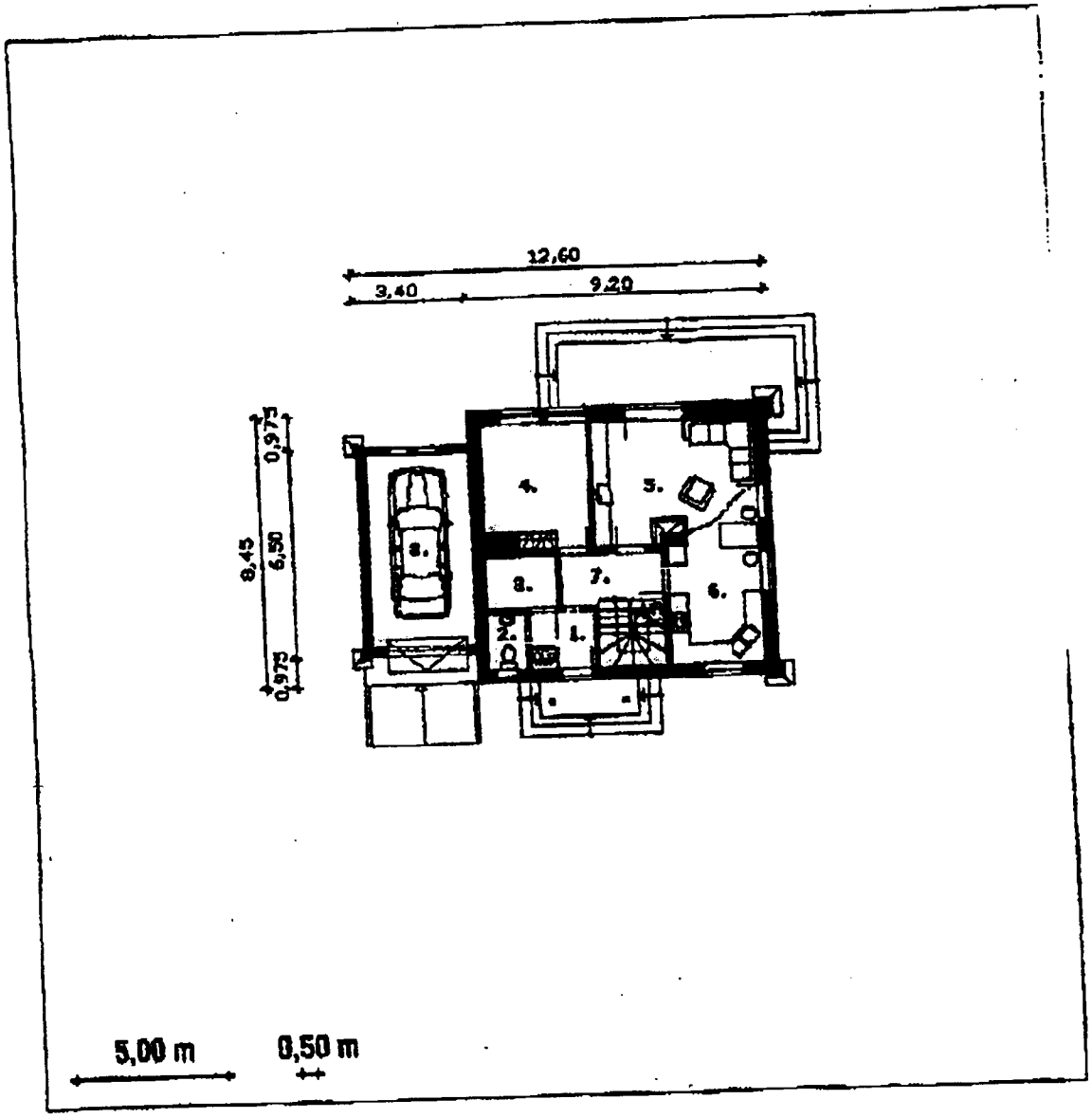
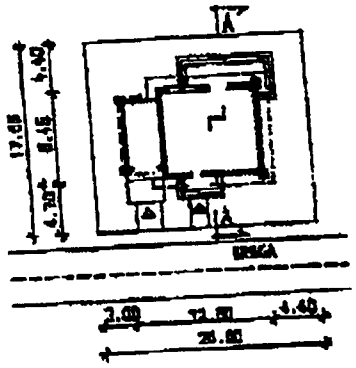


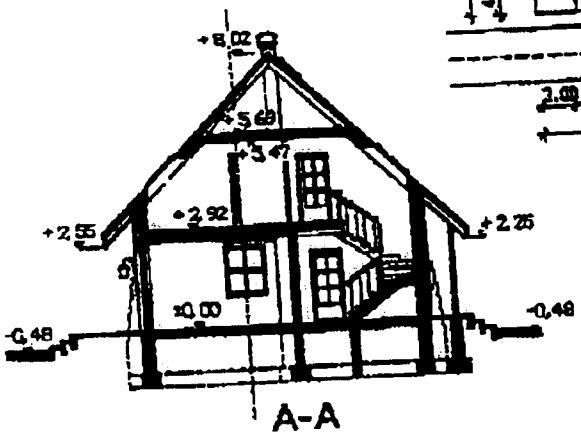
Report Navigation

Report Navigation

MINIMALNE WYMIARY DZIAŁKI

* Ostateczną odległość od drogi ustala DECYZJA O WARUNKACH ZABUDOWY I ZAGOSPODAROWANIA TERENU.





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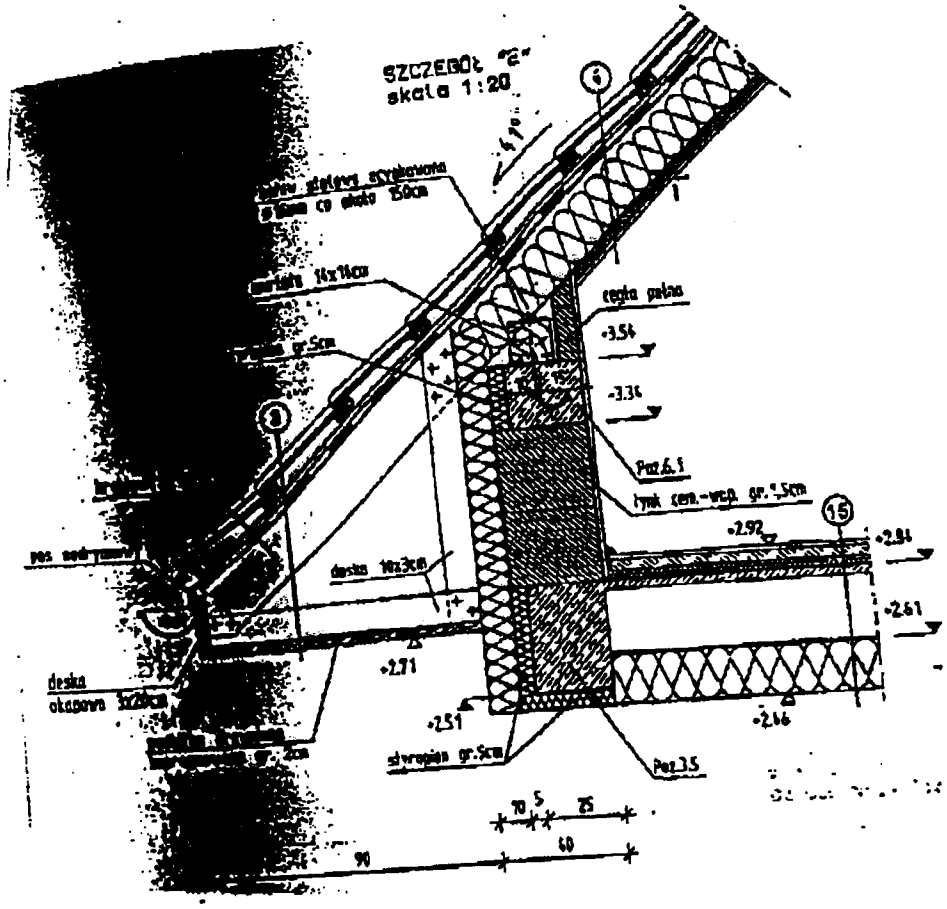

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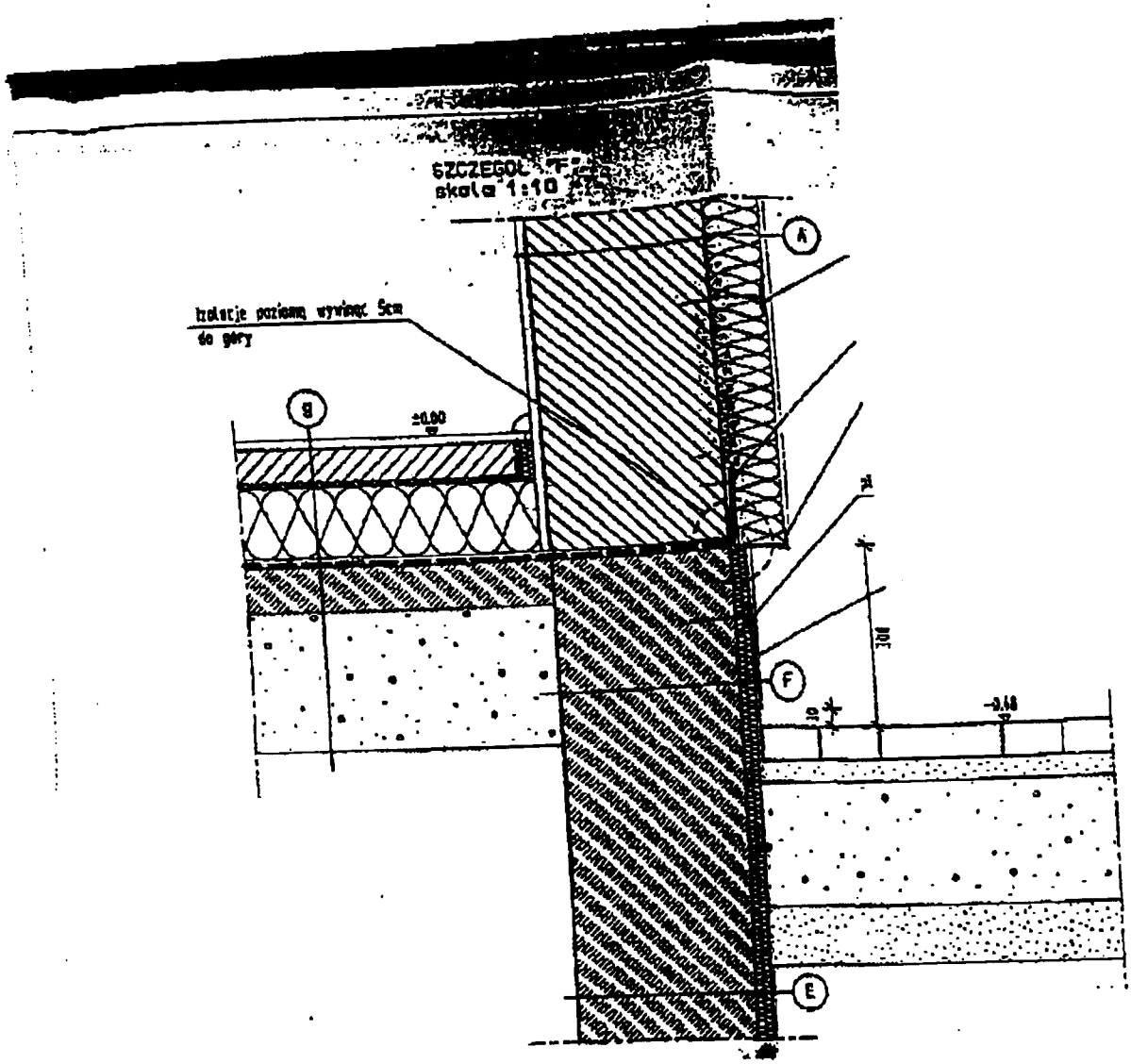

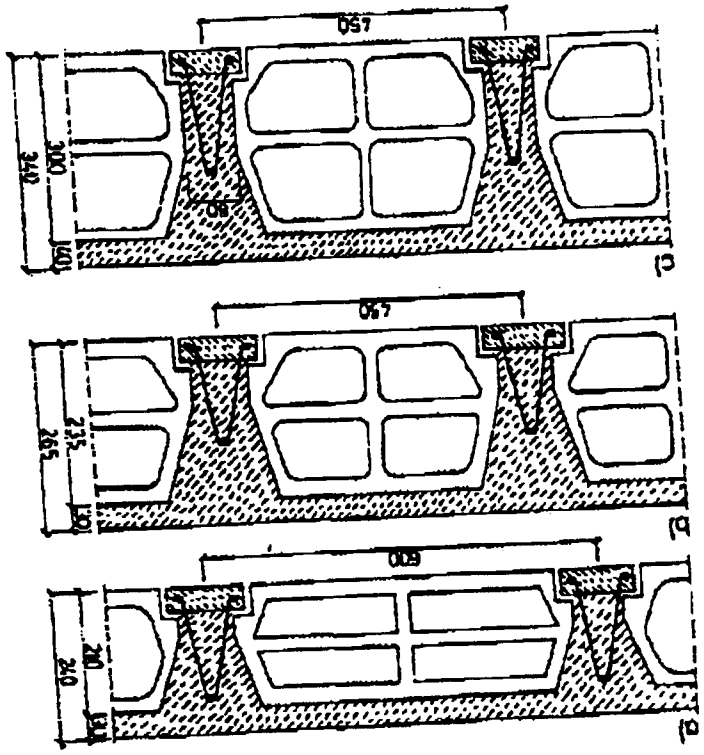
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3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.7 Poland Traditional House (cont'd)

Gross Floor Area		
	1st Floor	61.5m2
	2nd Floor	58.2m2
		119.7m2

	Item Description	Amount (USD)	Rate/m2 (USD)	% of Total	Notes
1	Earthworks	140	1.17	0.2%	
2	Foundations	4,185	34.97	5.5%	
3	Load Bearing Walls - Ground Floor	2,328	19.45	3.1%	
4	Chimney and Ventilation Ducts - Ground Floor	527	4.40	0.7%	
5	R.C. Slab Over Ground Floor	1,920	16.04	2.5%	
6	Load Bearing Walls - 1st Floor	1,342	11.21	1.8%	
7	Chimney and Ventilation Ducts - 1st Floor	758	6.33	1.0%	
8	Roof Timber Structure	2,984	24.93	3.9%	
9	Roof	9,577	80.01	12.6%	
10	Partition Walls - Ground Floor	552	4.61	0.7%	
11	Floor - Ground Floor	1,273	10.64	1.7%	
12	Partition Walls - 1st Floor	653	5.45	0.9%	
13	Floor - 1st Floor	340	2.84	0.4%	
14	Finishing Works	14,942	124.83	19.6%	
15	Doors and Windows	8,649	72.26	11.4%	
16	External Works	884	7.39	1.2%	
17	Electrical Installation (Light Fixtures Excluded)	2,400	20.05	3.2%	
18	Plumbing	3,300	27.57	4.3%	
19	Heating	3,421	28.58	4.5%	
20	Cabinets and Vanities	706	5.90	0.9%	
21	Specialty Items	780	6.52	1.0%	
22	Washroom Accessories	225	1.88	0.3%	
	Total Trade Cost	**61,887**	**517.02**	**81.3%**	
	Site Expenses (7%)	**4,332**	**36.19**	**5.7%**	
	G. C.'s Overhead & Profit (15%)	**9,933**	**82.98**	**13.0%**	
	Total Construction Cost (USD)	**76,152**	**636.19**	**100.0%**	

8. RUSSIA

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.8 Russia Traditional House

The attached commentary is an excerpt from our Russian consultant which places the subject in perspective with regard to accommodation levels, construction materials and methods of construction.

The most popular individual house for construction for average Russian family in Moscow is:

- A two-storey detached house with a basement, two lavatories, about five rooms and an attic floor.
- Gross floor area about 120-170 m2.
- Brick masonry walls, brick partitions, hollow-core doors and wooden windows, a wooden and steel staircase, a wooden frame for the blind attic floor and a steel sheet covered roof.

The house for the breakdown was taken a little bit larger then usual, because drawings were available. Its gross floor area is about 260 m2 (inside walls), but including a garage, a heating room, a provisional room for sauna with a bath inside the basement of the house and two summer rooms on the second floor.
The cost breakdown is attached. By the way, it contains the prices, which are not very high for most of the items, because I tried to find the cost for a simple house for an average income family. I assumed that the customer will be involved in the construction process and the price control as is usual in Russia.

Here is a short description of the main items:

Excavations/ backfilling – include moving the topsoil level 10 m away by a caterpillar tractor and backfilled soil ramming. In this case, excavations are not so large, because the house is designed for high level subsoil water.

Basement structure – it could be cast on site or made with pre-cast concrete blocks, but we priced it as made on site with pouring concrete.

Structure – walls priced as the most popular now made from foamed concrete blocks (for high thermal resistance) and red brick masonry as facing and strengthening of the wall. Flooring is made with pre-fabricated reinforced hollow-core concrete slabs to allow finishing of the floors and ceiling without gypsum boards and additional insulation, which are still not very popular in Russia.

Roof – priced for a simple wood frame and zinc-coated steel covering.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.8 Russia Traditional House (cont'd)

Windows/doors – these items are not of the best quality, but include all hardware and coating.

Exterior finishing – priced not as on the attached picture, because it is more easy to face walls with bricks everywhere without complicated plastering and painting (except concrete basement).

Systems – heating (gas-fired with steel radiators), plumbing (steel pipes for water supply and plastic for sewer) and electrical systems are priced with using as much of local units as possible. In fact, prices can differ very much.

Inside finishing – laminate flooring (looks like wood plank) for the living space, cheap tiling for basement and nice ceramic tiling for the kitchen and lavatories. Good painting for all inside walls, except the humid spaces. White water paint to the ceilings and suspended a ceiling in lavatories.

Others –kitchen, toilet and bathroom accessories are not included in the scope, as it is not typical for Russia. And the general requirements are not in the breakdown, but they are under it just for comparing.

Whist the above initial description is valid and pertains to the "most popular house for construction for average Russian family in Moscow", the real case example as illustrated herein is considerably larger than the standard house (260.0m2 including garage and balcony). Also the illustration shows three levels of finished accommodation, with the lowest level being at the ground floor (see garage and front entrance).

Therefore in order to make a meaningful cost comparison with the Baseline Canadian Wood Frame House, we have to consider this example as a three storey house without a basement, and the Ratio to the Baseline House, we estimate between 75% - 80%. (Please refer to "Methodology" section of Introduction.)

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.8 Russia Traditional House (cont'd)

Cost Analysis

From the construction cost estimate noted herein:

A) Total Construction Cost
219.2m2 @ USD 450.84 = USD 98,826
= CAD 663.42/m2 (1.4715)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
(Three storey, no basement)
[Assume 78% of Baseline] (CAD 852.67) = CAD 665.08/m2

C) Cost of Canadian Wood Frame
House with basement, built in Russia
(Refer to Methodology) = CAD 873.12/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian Wood
Framed House, 3 storey no basement built
in Russia [78% of above](Refer to Methodology) = CAD 681.03/m2

E) Russia Traditional House,
3 storey, no basement (from A above) = CAD 663.42/m2

F) Cost of Complete Russian Traditional
house on 100m2 Comparative basis = CAD 66,342

Conclusion

Comparing D and E above it is noted that the Canadian Wood Framed House (ie: 3 storey no basement) costs almost the same as the equivalent traditional house in Russia.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

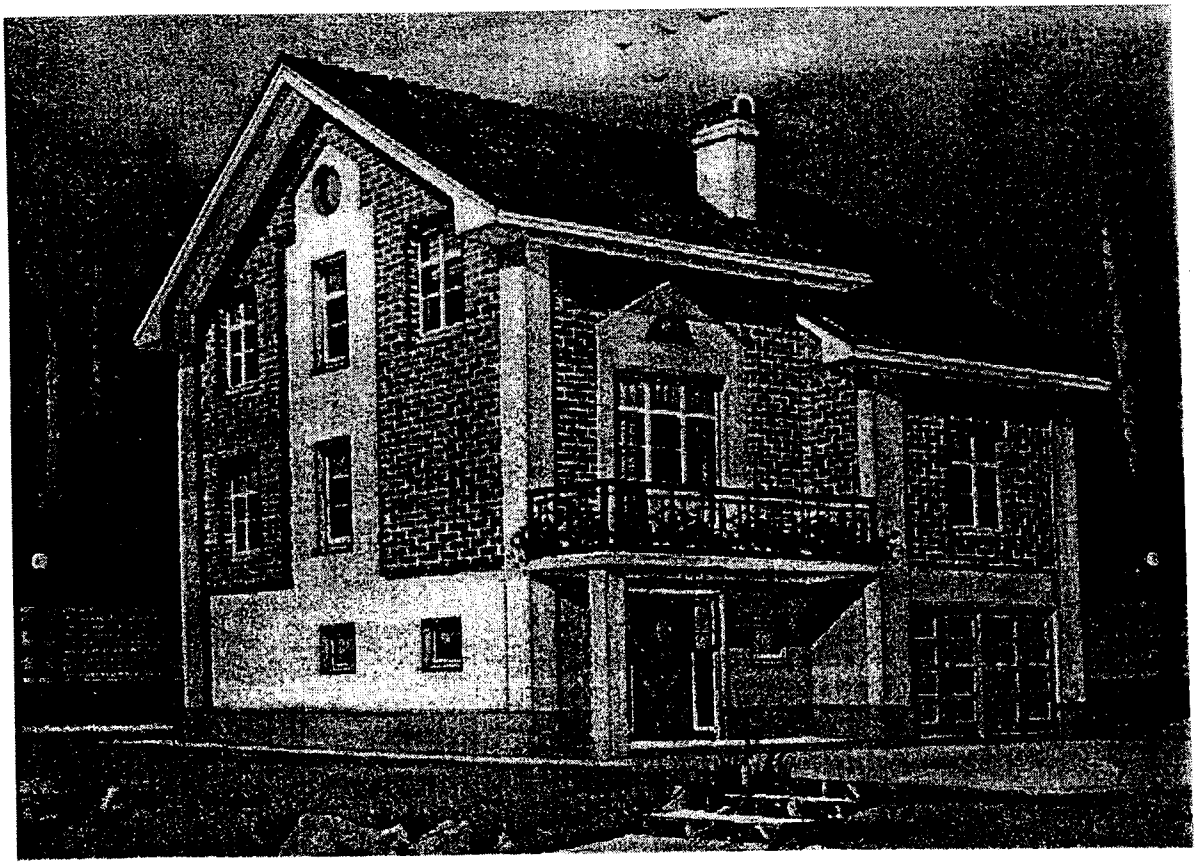
3.8 Russia Traditional House (cont'd)

Export Opportunities

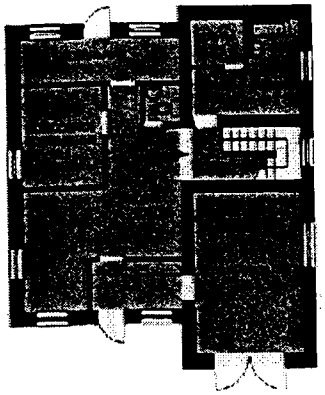
Having regard it the specification it is noted that lumber is minimal and it appears that roof members consist of a simple wood frame.

Bearing this in mind and the fact that house total costs are similar, componentised or prefabricated units may be a possible option by reducing erection time.

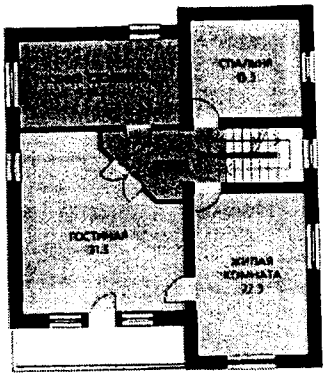
Report Navigation



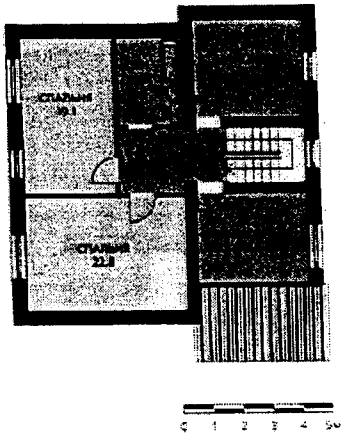
Basement layout



First floor layout



Second floor layout



(12200 x 10400)

Total area including garage and all other rooms in basement 260.0 sqm / living (light colored) area 109.0 sqm / balcony 8.5 sqm.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.8 Russia Traditional House (cont'd)

Gross Floor Area		
	Total House Area	260.00m2
	Less Garage	-30.30m2
	Less Balcony	-8.50m2
		219.20m2

	Item Description	Amount (USD)	Rate/m2 (USD)	% of Total	Notes
1	Excavation & Filling	1,711	7.81	1.7%	
2	Basement Structure & Ground Floor Slab	8,735	39.85	8.8%	
3	Walls and Flooring	29,658	135.30	30.0%	
4	Roofing	7,610	34.72	7.7%	
5	Windows, Doors, Stairs & Deck	9,661	44.07	9.8%	
6	Exterior Cladding / Roofing Elements	3,225	14.71	3.3%	
7	Heating	3,650	16.65	3.7%	
8	Plumbing	2,780	12.68	2.8%	
9	Electrical	2,700	12.32	2.7%	
10	Floor, Wall and Ceiling Finishes	13,479	61.49	13.6%	
11	Specialties, Fireplace, Washroom Accessories	2,457	11.21	2.5%	
	Total Trade Cost	**85,666**	**390.81**	**86.7%**	
	General Requirements (12%)	**10,280**	**46.90**	**10.4%**	
	Fees (Overhead and Profit 3%)	**2,878**	**13.13**	**2.9%**	
	Total Construction Cost (USD)	**98,824**	**450.84**	**100.0%**	

9. SOUTH KOREA

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.9 South Korea Traditional House

Introduction

The traditional house provided by our South Korean consultant is a two storey, 2-bedroom concrete structure, with no basement. The gross floor area is 110m2. The pages which follow include the following:

1. Description of Building
2. Outline Specification
3. Trade Cost Breakdown

*Plans were not provided

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost
110m2 @ KRW 822,778/m2 = KRW 90,505,622
= CAD 1,092/m2 (0.0013270)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
[Two storey, no basement](Refer to Methodology) = CAD 705.94/m2

C) Cost of Canadian Wood Frame
House with basement, built in South Korea
(Refer to Methodology) = CAD 1,062.93/m2

D) Adjust for Equivalent Cost of Canadian Wood
Framed House, 2 storey no basement
[83% of above](Refer to Methodology) = CAD 882.23/m2

E) Cost of South Korean Traditional House,
2 storey, no basement (from A above) = CAD 1,092/m2

F) Cost of Complete house on
100m2 comparative basis = CAD 109,200

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.9 South Korea Traditional House (cont'd)

Conclusion

Comparing the above figures D and E it is noted that the Canadian Wood Frame construction is a approximately 20% cheaper to construct in South Korea as it is to construct the traditional house, making this country an excellent candidate for a Canadian export initiative.

Outline Specification

The traditional house provided to us is a two storey 2 bedroom concrete structure with a total gross floor area of 110m2 (note no basement).

Foundation

Basement Excavation
- N/A

Special Conditions

Lowest Floor Construction
- Excavation and backfilling
- Hardcore filling
- Damp proof concrete including damp proof sheet
- Ground floor concrete slab

Upper Floor Construction
- Formwork – slab
- Concrete – slab
- Staircase with balustrades
- Wooden flooring

Roof Construction
- Pitched wood roof

Walls Below Grade

Walls Above Grade
- Formwork, and concrete
- Burnt red brick and brick work
- Thermal insulation

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.9 South Korea Traditional House (cont'd)

Windows & Entrances
- Sliding aluminium window sashes with glazing, complete unit installed
- Exterior doors

Roof Coverings
- Asphalt Shingles

Projections
- Eaves gutter
- Down spouts

Partitions
- Gypsum board wall construction

Doors
- Hinged doors, hollow core, flush face wood
- Two leaf bi-folding door

Floor Finish
- Vinyl chloride sheet
- Porcelain tile
- Porcelain tile to balcony/floor

Ceiling Finishes
- Vinyl covering

Wall Finishes
- Vinyl wall covering
- Porcelain tile
- Caulking edge of tile around sink
- Painting
- Plastering

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.9 South Korea Traditional House (cont'd)

Fittings & Fixtures
- Kitchen sink and cabinet with countertop
- Bath unit includes bath tub and fittings
- Shoe racks
- Paper holder for toilet
- Towel rail
- Wash basin, cabinet and counter

Equipment

Mechanical
- Water supply pipe and fittings
- Hot water supply pipe and fittings
- Drainage pipe and fittings
- Connection to bath, wash basin and kitchen sink
- Mixing faucet for kitchen sink
- Western style water closet
- Universal faucet
- Hot water supply boiler
- Panel heating

Electrical
- Light fixtures
- Outlets (lighting and receptacles)
- Communications (TV, telephone, interphone)
- Switchboard
- Connection to main electricity supply
- Mechanical ventilation fan

Site Development
- Site expenses

Mechanical Site Services

Electrical Site Services

General Requirements
- Percentage provided to us by consultant

Report Navigation

Typical Single House Model
(South Korea)

Floor Area

1 F	:	64.22
2 F	:	45.53
Total Floor Area	:	109.7

Construction Site : Soul

Exterior Finnish

Foundation	:	Concrete slab/ footing
Roof	:	Asphalt shingles roofing
Exterior Wall	:	Concrete wall or Bearing brick wall
External opening	:	Entrance door/aluminum frame door, Window/ aluminum sash with pair glass

Interior Finishes

Rooms	Floor	Skirting	Wall	Ceiling	Note
Dining / family room	Vinyl sheet	Rubber or Wood	Wall paper	Wall paper on Gyp board	Floor panel heating
Kitchen	Vinyl sheet	Rubber or Wood	Ceramic tiles/ Wall paper	Wall paper on Gyp board	Floor panel heating (Standard appliance, sink)
Bath room	Ceramic tiles	Ceramic tiles	Ceramic tiles	Vinyl sheet	Bathtub or Shower booth
Garage	Unfinished	Painted	Painted	Painted	

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.9 South Korea Traditional House (cont'd)

Gross Floor Area		
	1st Floor	64.22m2
	2nd Floor	45.53m2
		109.75m2

	Item Description	Amount (KRW)	Rate/m2 (KRW)	% of Total	Notes
1	Temporary Works	3,727,163	33,883.30	4.1%	
2	Foundation Work	3,949,425	35,903.86	4.4%	
3	Carpentry Works	23,122,228	210,202.07	25.5%	
4	Roof and Sheet Metal Work	6,178,584	56,168.95	6.8%	
5	Doors & Windows	2,886,057	26,236.88	3.2%	
6	Ext. Finish & Plaster Works	6,576,140	59,783.09	7.3%	
7	Interior Finishes	6,492,330	59,021.18	7.2%	
8	Equipment & Fittings	3,050,000	27,727.27	3.4%	
9	Miscellaneous Works	1,298,896	11,808.15	1.4%	
10	Electrical Installation	5,961,600	54,196.36	6.6%	
11	Plumbing & Drainage Works	13,363,199	121,483.63	14.8%	
12	Design & Permit	4,000,000	36,363.64	4.4%	
13	Site Expenses	2,000,000	18,181.82	2.2%	
	Total Trade Cost	**82,605,622**	**750,960.20**	**91.3%**	
	General Overhead & Profit (9.6%)	**7,900,000**	**71,818.18**	**8.7%**	
	Total Construction Cost (KRW)	**90,505,622**	**822,778.38**	**100.0%**	

10. SPAIN

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.10 Spain Traditional House

Introduction

The following is an example and analysis of a typical two storey Spanish house, built 60km from Madrid. The information includes:

1. Description of House
2. Outline Specification
3. Trade Cost Breakdown

*No plans were provided

Cost Analysis

A) Total Construction Cost (Excluding VAT)
152m2 @ ESP 64,176/m2 = ESP 9,754,841
= CAD 503.85/m2 (0.0078510)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
(Two storey, no basement)(Refer to Methodology) = CAD 705.94/m2

C) Cost of Canadian Wood Frame
House with basement, built in Spain
(Refer to Methodology) = CAD 1,166.02/m2

D) Adjust for Equivalent Cost of Wood
Framed House, 2 storey no basement
[83% of above](Refer to Methodology) = CAD 967.80/m2

E) Cost of Spanish Traditional House,
2 storey, no basement (from A above) = CAD 503.85/m2

F) Cost of Complete Spanish
Traditional house on
(2 storey, no basement) = CAD 50,385

Conclusion

Comparing costs D and E above, it is noted that the cost of building an equivalent sized house in Spain (2 storeys, no basement) using Canadian components and systems is almost twice the cost of building with traditional Spanish materials and systems.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.10 Spain Traditional House (cont'd)

The main reason for this according to our Spanish consultant is a cultural difference in terms of materials and building methods. Firstly, timber framed construction is most unusual, particularly in regard to past customs and primarily the cost of timber, both indigenous and especially imported is very expensive. (the UN formally classify 25% of the Spanish state as desert).

With respect to finishes, plaster and paint is much preferred to drywall which is used mainly for office construction. Climate also plays a major factor is construction where temperatures and humidity varies hugely, particularly where air conditioning in standard residential housing is uncommon (in Madrid for example buildings are designed to temperatures of –10 C to 40 C)

Export Opportunities

As noted the exporting of wood frame and other Canadian materials to Spain will be a tough sell for Canadian exporters, since overall construction costs of the traditional home are much less expensive. Lack of construction expertise is also a factor and the testing of new materials and systems is somewhat unwelcome, both from the constructor and purchaser's point of view. On top of all this, to middle class family, a wooden framed building, we are told is seen as a bigger than usual, "garden shed".

On a positive note, it is noted that some form of prefabrication may be a better export initiative, particularly due to the lack of dimensional co-ordination and on-site quality control. Speed of erection and simple system building may be the keynote for success.

Description and Outline Specification

Two storey detached house with garage, no basement, 3 bedrooms, 2 bathrooms.

Gross Floor Area

House	152 m2
Garage	18 m2
	170 m2

Foundation
- Concrete strip footings

Structure
- Concrete columns & tie beams

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.10 Spain Traditional House (cont'd)

Walls
- Clay block and face brick

Roof
- Metal beams, brick infill, clay tile

Windows
- Aluminium double glazed

Partition
- Block work

Doors
- Wood, veneer finish

Wall Finish
- Plaster, paint

Ceilings
- False, fibrous plaster

Floors
- Imitation wood strip
- Kitchen & bathrooms - ceramic

Plumbing
- Residential quality

Electrical
- Residential quality, 220-260 Volts
- No air-conditioning

Heating
- Boiler – gas fired

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.10 Spain Traditional House (cont'd)

Gross Floor Area 152m2 excluding garage

	Item Description	Amount (ESP)	Rate/m2 (ESP)	% of Total	Notes
1	Earthworks	81,999	539.47	0.8%	
2	Drainage	94,787	623.60	1.0%	
3	Foundations and Slabs	658,584	4,332.79	6.8%	
4	Structures	1,897,446	12,483.20	19.5%	
5	Enclosure & Internal Separations	1,579,064	10,388.58	16.2%	
6	Plastering, Rendering & False Ceilings	491,965	3,236.61	5.0%	
7	Roofing	442,422	2,910.67	4.5%	
8	Insulation & Waterproofing	147,637	971.30	1.5%	
9	Paving & Floorings	673,058	4,428.01	6.9%	
10	Tiling and Pre-Fab Finishes	305,257	2,008.27	3.1%	
11	Timber Carpentry	407,929	2,683.74	4.2%	
12	Aluminium Carpentry	383,173	2,520.88	3.9%	
13	Ironmongery	427,886	2,815.04	4.4%	
14	Glazing	51,494	338.78	0.5%	
15	Plumbing & Appliances	529,687	3,484.78	5.4%	
16	Heating	421,983	2,776.20	4.3%	
17	Electricity / Telecommunications	312,137	2,053.53	3.2%	
18	Painting	125,753	827.32	1.3%	
	Total Trade Cost	**9,032,261**	**59,422.77**	**92.6%**	
	General Overhead & Profit (8.0%)	**722,581**	**4,753.82**	**7.4%**	
	Total Construction Cost (ESP)	**9,754,842**	**64,176.59**	**100.0%**	

11. UNITED KINGDOM

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.11 United Kingdom Traditional House

Introduction

The pages which follow provide an analysis of a typical UK house built in the outskirts of Birmingham. This information includes:

1. Elevations & Sections
2. Description, Specification
3. Trade Cost Breakdown
4. UK Report on timber frame construction

Gross Floor Area

For consistent costing analysis with Canada, 8% has been added to the net area to cover outer wall thickness.

122m2 + 8% = 131.76m2

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost (excluding VAT)
131.76m2 @ 742.26GBP/m2 = GBP 97,800
= CAD 1,582.42/m2 (2.131909)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
[Two storey, no basement](Refer to Methodology) = CAD 705.94/m2

C) Cost of Canadian Wood Frame
House with basement, built in UK
(Refer to Methodology) = CAD 1,984.47/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian
Wood Framed House, 2 storey no basement
[83% of above](Refer to Methodology) = CAD 1,647.11/m2

E) UK Traditional House Cost
(2 storey no basement) From A above = CAD 1,582.42/m2

F) Cost of Complete UK Traditional
House (2 storey, no basement) = CAD 158,242

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.11 United Kingdom Traditional House (cont'd)

Conclusion

Comparing the cost of D and E above, it is noted that the cost of building an equivalent sized house (2 storey, no basement) using Canadian components is slightly more expensive than building with traditional UK materials.

When comparing the study base case (ie: single storey, wood frame with basement) of Canada versus UK, ratios of 2.33 are noted which indicates the building components have a much higher cost in the UK.

Export Opportunities

The above analysis indicates that a potential market exists, particularly for lumber products.

Also above ground packaged units, either single storey or two storey Canadian Wood Framed Construction would appear to be a viable option.

This of course implies that the customary perception of "solid is best" of the UK market is overcome. Please refer overleaf to a separate report provided by our UK consultant.

TIMBER FRAMED BUILDINGS IN THE UK

Timber framed building in the UK are very much the exception rather than the rule.

The Uk is a country poor in resources of coniferous building timber. There are supplies of deciduous woods: oak and ash principally and various coniferous timbers, though of small stature, but even these are limited.

The result is that virtually all coniferous and hardwoods for building purposes are imported. This of course brings a cost penalty, should timber be considered as a principal building material.

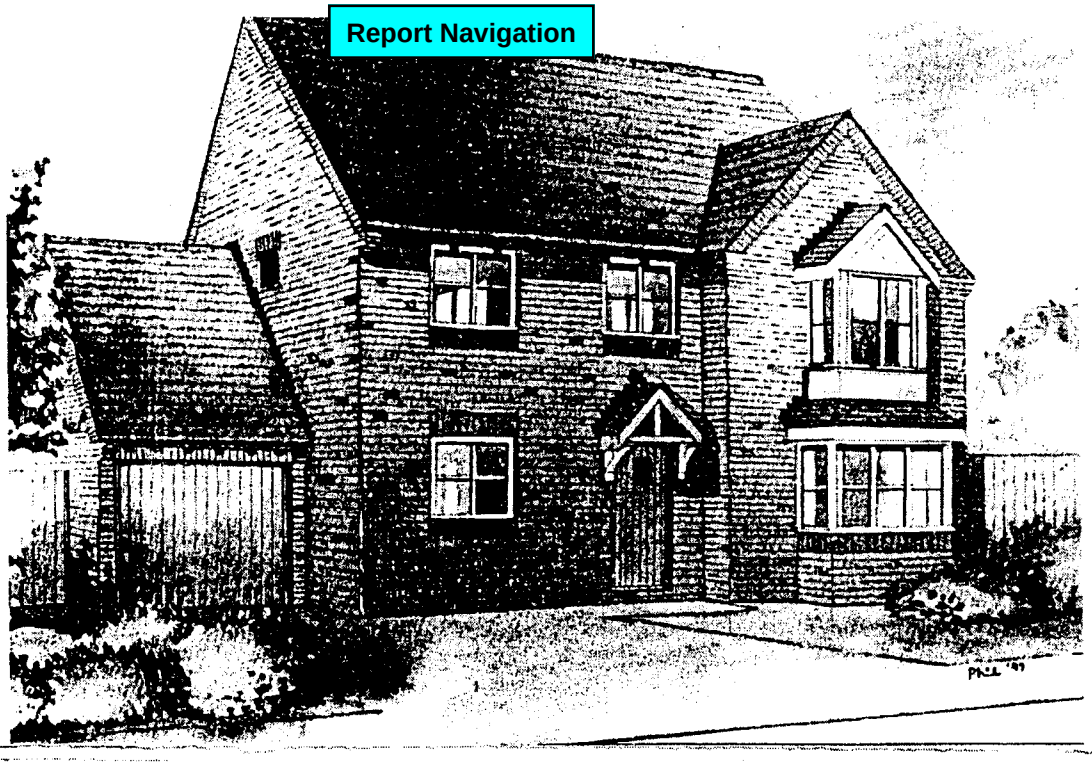
The UK climate conduces, and preference of the people is for, solid construction of brick and stone, with timber limited to upper floor construction, some partitioning and of course for joinery items
Even where timber has been used for constructing the framework, it is, in the UK, almost invariably covered with clay tile hanging or skins of facing brickwork to provide weather protection and low maintenance.

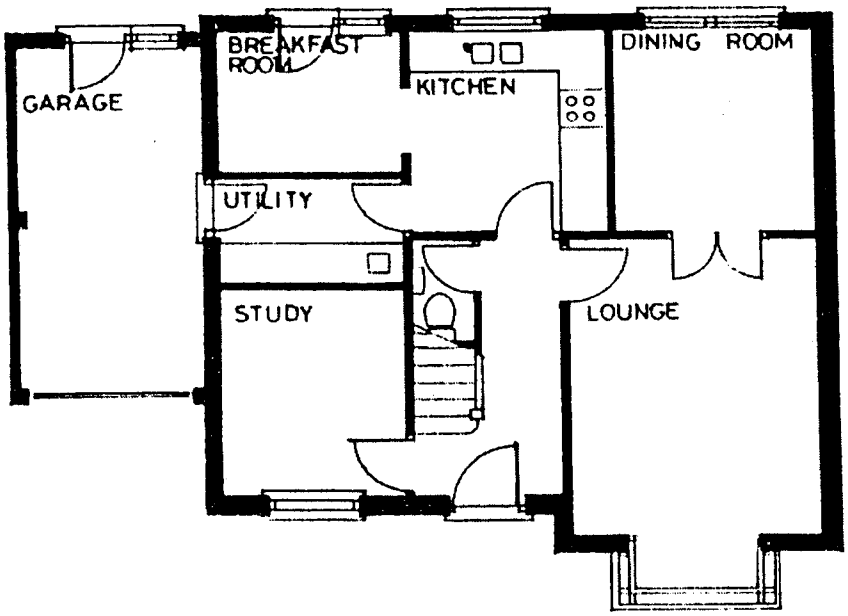
Culturally all modern (as opposed to historical) timber framed buildings are somehow regarded in the popular conception as being "temporary". Perhaps this goes back to the first and second world wars when vast numbers of military encampments were hastily built with timber. This was followed with emergency "pre-fabs" housing, constructed in a variety of materials including timber to temporarily replace bomb damaged housing.

The houses given for pricing is unusual to UK. There are a few examples of this type of building, but they were prefabricated in Canada and shipped over for re-assembly here. Even so they were erected on a flat slab without basement I cannot recall seeing a single example anywhere matching your drawings. It is not a common thing in the UK to provide a basement, this occurred mainly in the past in high density terraces of "Town Houses" where it made working space for the servants. Where cinstructed now, basements tend to be small and generally contain M&E plant only. The lowest floor level is usually the ground floor and is generally level with the outside ground level

The temperate climate enjoyed by UK is the main reason for not constructing basement. As severe winters are very rare, there is no need to go very deep for frost free foundations, consequently the added expense of going deep enough to provide a basement is not require, also saving the problems of waterproofing any below ground accommodation

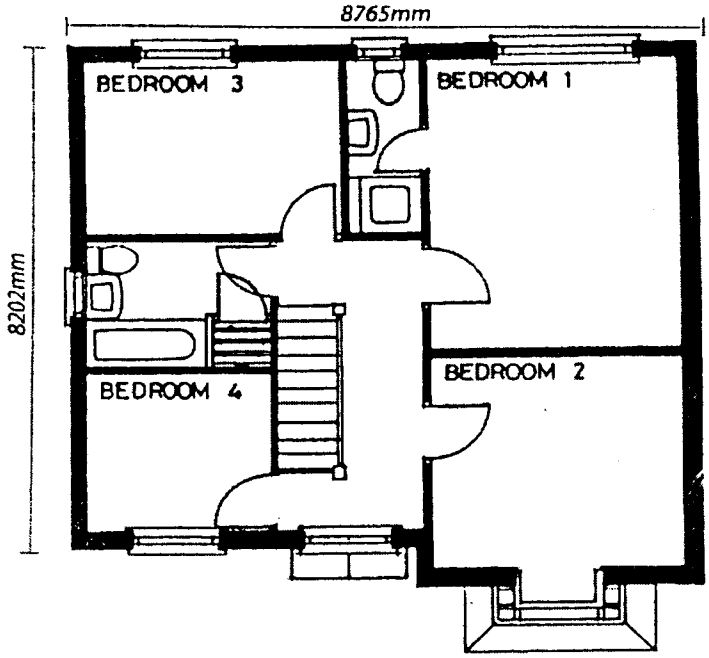
Report Navigation





The benchmark house is brick and block construction built to the regulations applicable in 2000. This includes the Disabled Access arrangements (Part M) but not the 2002 thermal regulations (Part L). However the cost tables 2a have been adjusted to take account of the latest changes — more insulation, better windows and a more efficient boiler being the principal changes.

GROUND FLOOR: Internal area is 61m², excluding the attached single garage which has an internal floor area of 14m². Note that internal floor area specifically excludes the external walls — this is the preferred way of measuring floor area in UK housing, but not everybody is this scrupulous.



FIRST FLOOR: Net floor area is the same as the floor below — i.e. 61m². Combined you get a total of 122m², about average for a four bedroomed developer built house. The arrangement of bedrooms and bathrooms (one en-suite, the other a family affair) is also absolutely typical.

Report Navigation

TRADITIONAL HOUSE FOR THE UK

Basic description

Four bedroom speculative detached house of brick and block construction with attached garage. See attached floor plans and elevations.

Location.

Location is Birmingham area.

Floor area

Net floor area is approx. 122m2. This is measured to the inside of external walls and excludes the area of the attached garage.

Specification

Foundations. Trench filled concrete footings. Concrete floor slabs with underfloor insulation.

External walls. Facing brick outer skin with block inner skin and 100mm insulation.

First fix carpentry. Wood joists with t &g plywood floor. Wood roof trusses.

Second Fix. Double-glazed wood windows. Wood external doors and frames. Wood staircase. Wood veneered flush doors and linings. Wood skirtings and architraves.

Roofing. Concrete interlocking roof tiles with battens and roofing felt.

Internal finishings. Plasterboard to walls and ceilings with emulsion paint. Ceramic floor tiles to kitchen. Ceramic wall tiles to bathroom tub. Painting wood int and ext.

Kitchen units. Kitchen units with plastic laminate worktops. Sink.

Electrical. Lighting and power. TV outlets. Smoke detectors. Phone sockets. Kitchen and bathroom fans.

Heating and plumbing. Gas central heating with thermostatically controlled radiators. Mains pressure hot water cylinder. White residential quality bathroom fixtures.

Externals. Gravel driveway. Path. Fence. Turf. Excludes contribution to Estate Roads.

Overheads. Share of costs of drawings,planning approvals,building regulation approvals and the like. Water connection. Electrical connection. Warranty. Site management. Office Overheads.

Profit. An amount to cover a reasonable profit margin. The actual profit will depend on the market conditions,

Cost Summary.	**GB pounds**
* Foundations.	7,800
* External Walls.	14,500
* First Fix Carpentry.	8,600

Report Navigation

* Second Fix.		4,000
* Roofing.		4,200
* Internal Finishings.		18,100
Plasterboard.	5,900	
Kitchen Units.	3,100	
Painting/Floors .	9,100	
* Electrical.		4,500
* Heating and Plumbing.		8,800
* External Works.		4,500
* Overheads.		16,400
Planning ,regs etc	2.500	
Warranty.	500	
Connections.	1,700	
Site management.	4,700	
Office Overhead.	7,000	
* Profit.		6,400
TOTAL.		97,800

Cost per m2 (122m2) (excluding garage). GBP 802m2

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.11 United Kingdom Traditional House (cont'd)

Gross Floor Area

For consistent costing analysis with Canada, 8% has been added to the net area to cover outer wall thickness.

122m2 + 8% = 131.76m2

	Item Description	Amount (GBP)	Rate/m2 (GBP)	% of Total	Notes
1	Foundations	7,800	59.20	8.0%	
2	External Walls	14,500	110.05	14.8%	
3	First Fix Carpentry	8,600	65.27	8.8%	
4	Second Fix Carpentry	4,000	30.36	4.1%	
5	Roofing	4,200	31.88	4.3%	
6	Internal Finishings	18,100	137.37	18.5%	
7	Electrical	4,500	34.15	4.6%	
8	Heating & Plumbing	8,800	66.79	9.0%	
9	External Works	4,500	34.15	4.6%	
	Total Trade Cost	**75,000**	**569.22**	**76.7%**	
	Overhead (22.0%)	**16,400**	**124.47**	**16.8%**	
	Profit (7.0%)	**6,400**	**48.57**	**6.5%**	
	Total Construction Cost (GBP)	**97,800**	**742.26**	**100.0%**	

12. UNITED STATES OF AMERICA

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House

USA Traditional House

Introduction

The house selected is this real case study reflects the larger space accommodation, customary for a middle class family in this area. It has been selected due to its specification being mostly consistent with the Canadian Wood Frame House, with the exception of air conditioning. This example of a typical USA house is a single storey, three bedroom, wood framed construction, with no basement, on a concrete foundation.

Project Description

This one story custom detached house is commonly referred to as a 'ranch'. It comprises a gross area of approximately 235 m2, and incorporates the following:

Gross Floor Area

The gross floor area is made up as follows:

Ground Floor	169.05m2
Garage	40.00m2
Bonus Room	25.28m2
Total Area	234.33m2

For the purposes of this study, only the ground floor of occupied, heated space is considered (169m2). Also the Bonus room in the attic was not built, although designed.

Construction Site

Atlanta, Georgia

The pages which follow include:

1. Description and location of Building (Atlanta)
2. Drawings, elevations & sections
3. Outline Specifications
4. Trade Cost Breakdowns

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House (cont'd)

Exterior Finishes

Foundations: Concrete slab and footings
Structure: Wood stud framing to walls – both interior and exterior; Custom roof trusses
Exterior Closure: Stucco finish to front elevation with accent brick placed in selected areas. Vinyl siding to remaining three elevations.
Interior Construction: Gypsum drywall partitions and ceilings.
Roofing: Asphalt Shingles roofing; Power Air Vents.
Doors & Windows: Wood entrance door in wood frame; Aluminium & Glass rear sliding door; Hollow metal framed glass windows
Interior Finishes: See Below
Mechanical: Gas Heat; Electric Air Conditioning
Plumbing & Electrical: Typical residential fixtures/ installation

Rooms	Floor	Skirting	Wall	Ceiling	Notes
Foyer	Carpet	Wood Baseboard	Paint	Painted Gypsum Board	
Dining & Family Room	Carpet	Wood Baseboard	Paint	Painted Gypsum Board	(1)
Kitchen & Breakfast Area	Sheet Vinyl	Vinyl Base	Paint	Painted Gypsum Board	(2)
Bedrooms	Carpet	Wood Baseboard	Paint	Painted Gypsum Board	(3)
Bathrooms	Sheet Vinyl	Vinyl Base	Paint	Painted Gypsum Board	(4)
Walk-in Closet	Carpet	Wood Baseboard	Paint	Painted Gypsum Board	(5)
Bonus Room	Unfinished	None	None	None	
Garage	Unfinished	None	Paint	Painted Gypsum Board	

Notes

(1) Installed fireplace with chimney, tile to fireplace
(2) Standard appliances, kitchen sink, cabinetry with countertops
(3) Built-in closets, with shelving and coat racks
(4) Vanities with sinks, bath units, shower to Main Bedroom
(5) Shelving and coat racks

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House (cont'd)

Cost Analysis

From the construction cost estimate noted above:

A) Total Construction Cost
169m2 @ USD 633.73 = USD 107,133
= CAD 932.53/m2 (1.47150)

B) Comparative Cost of equivalent
Canadian wood frame house built in Canada
[single storey, no basement](Refer to Methodology) = CAD 775.14/m2

C) Cost of Canadian Wood Frame
House with basement, built in USA
(Refer to Methodology) = CAD 1,160.22/m2 (Case A)

D) Adjust for Equivalent Cost of Canadian
Wood Framed House, single storey no
Basement [89% of above](Refer to Methodology) = CAD 1,032.60

E) USA Traditional House,
single storey, no basement (from A above) = CAD 932.53/m2

F) Cost of Complete Traditional
house on 100m2 Comparative basis = CAD 93,253

Conclusion

Comparing the above figures D and E is appears that using local materials and labour the USA traditional house is approximately 10% less expensive than the Canadian wood frame equivalent.

Factors affecting this are location (Atlanta), which experiences higher labour costs.

Cities further north of Atlanta would appear to have a greater export potential, particularly those closer to the Canadian border where climate characteristics are somewhat similar to Canada. Chicago costs for example are approximately 20% higher than those of Atlanta.

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House (cont'd)

United States of America

The traditional house provided to us is one storey, 3 bedroom softwood construction on concrete foundations with a total gross floor area of 169m2 (note not basement).

Foundation

Basement Excavation

Special Conditions

Lowest Floor Construction
- Excavation/ Backfill
- Ground Floor concrete slab
- Termite pre-treatment

Upper Floor Construction

Roof Construction

Walls Below Grade

Walls Above Grade
- Wood stud framing including trusses
- Exterior stucco and vinyl siding
- Exterior brick
- Thermal insulation

Windows & Entrances
- Windows and rear sliding door
- Exterior front door
- Garage door (sectional overhead)
- Insect screens

Roof Coverings
- Asphalt shingles roofing

Projections
- Gutters and downspouts
- Eaves and soffits

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House (cont'd)

Partitions
- Gypsum board wall construction

Doors
- Interior solid core wood doors

Floor Finish
- Tilework
- Carpet

Ceiling Finishes
- Gypsum board ceilings
- Paint

Wall Finishes
- Paint

Fittings & Fixtures
- Cabinets and trim
- Vanity tops
- Fireplace, mantles and chimney
- Shower doors and mirrors

Equipment

Mechanical
- Plumbing fixtures
- Bathtubs
- HVAC
- Water supply and distribution

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House

Electrical
- Electrical installation
- Lighting and recessed fixtures

Site Development
- Site expenses

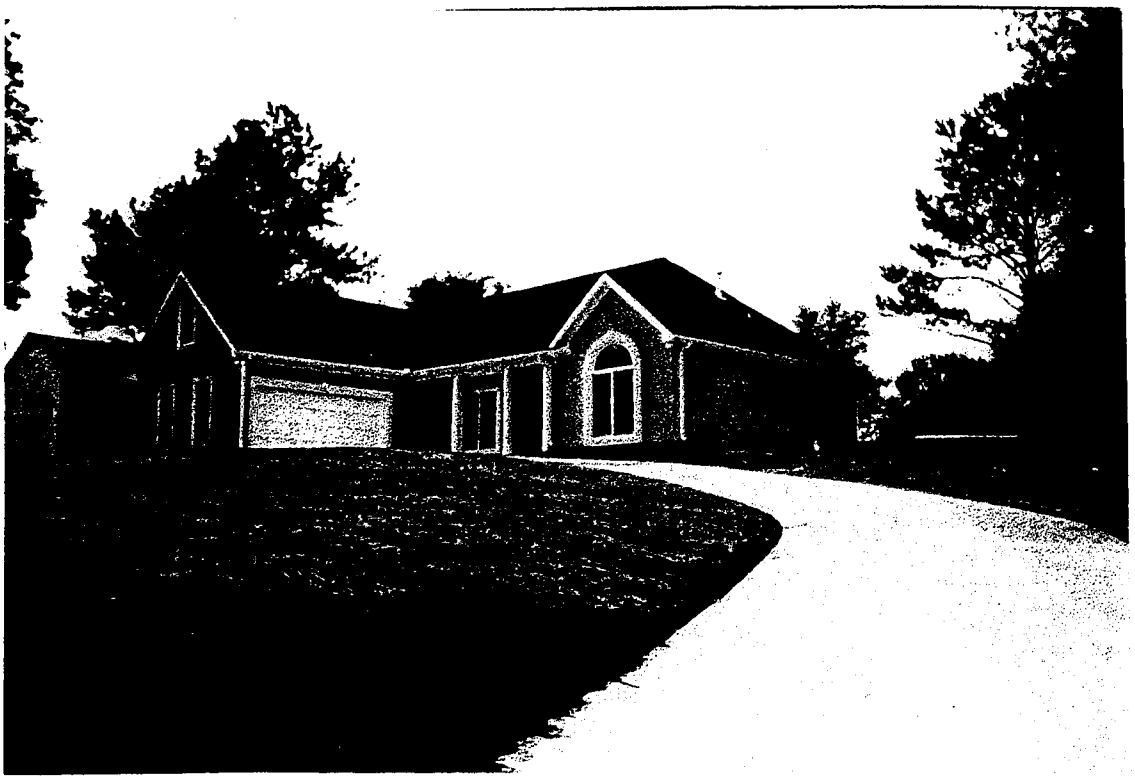
Mechanical Site Services

Electrical Site Services

General Requirements
- Percentage provided to us by consultant

Report Navigation

Report Navigation



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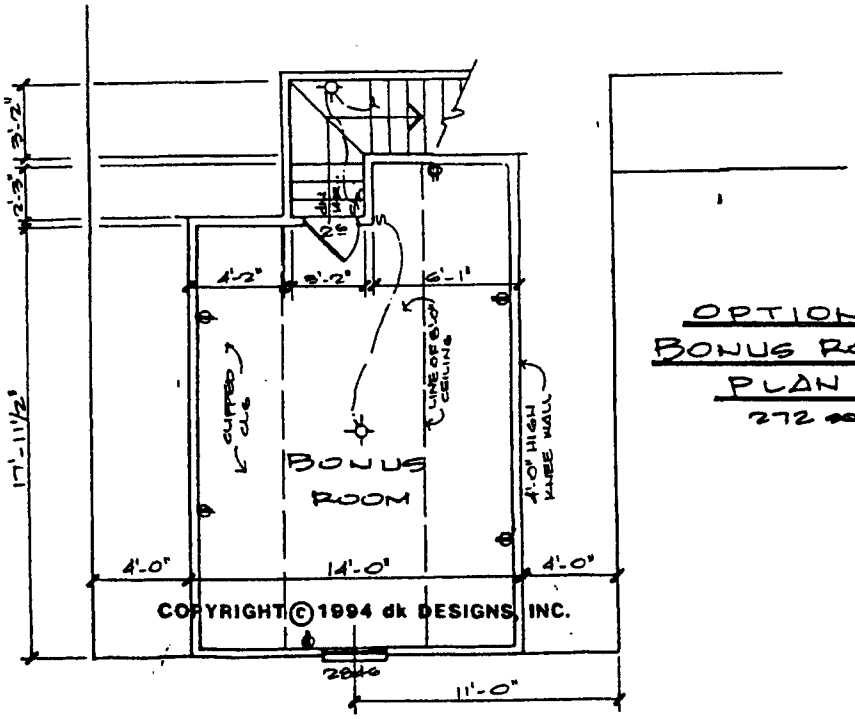
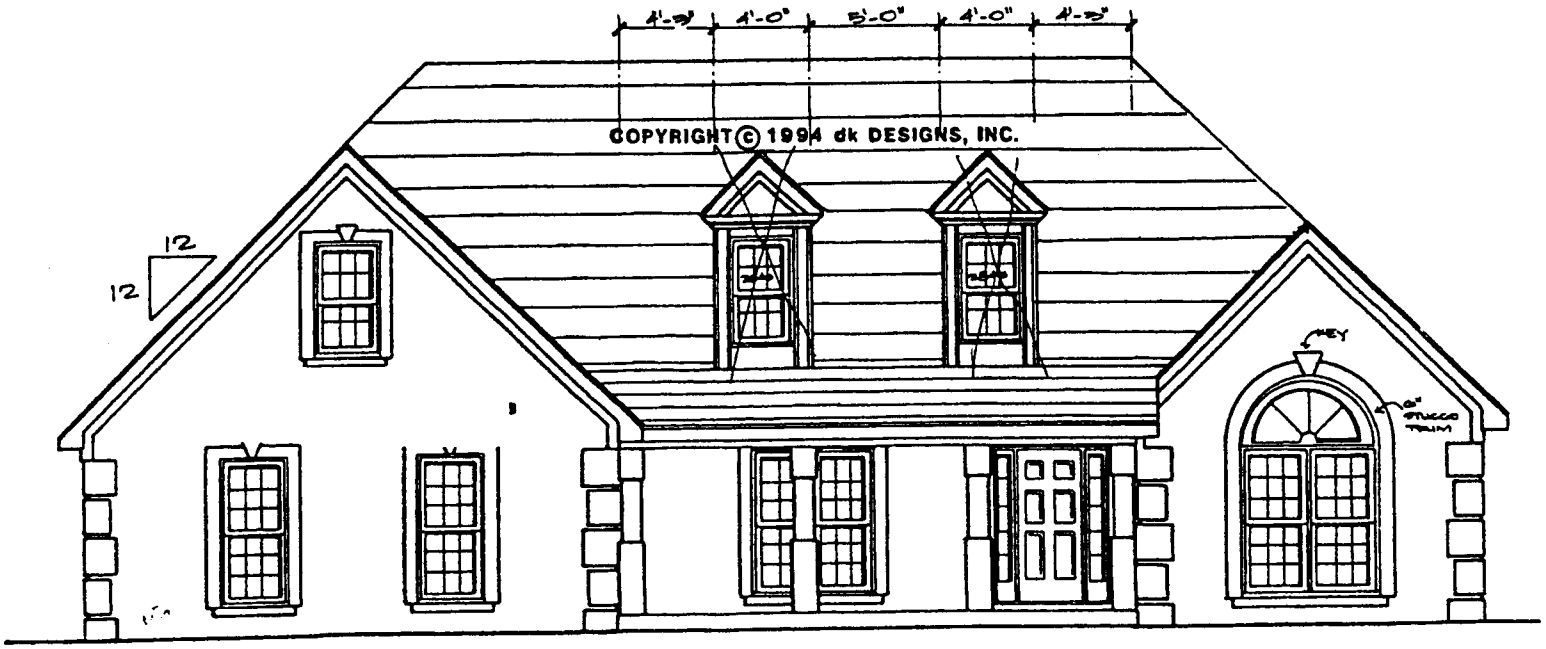


OPTIONAL BONUS ROOM PLAN

272 SQ. FT.



FRONT ELEVATION

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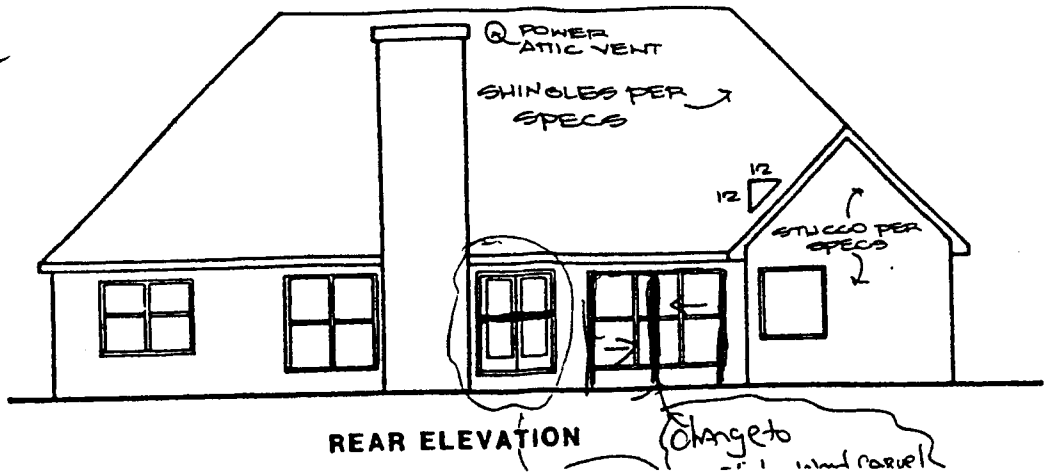
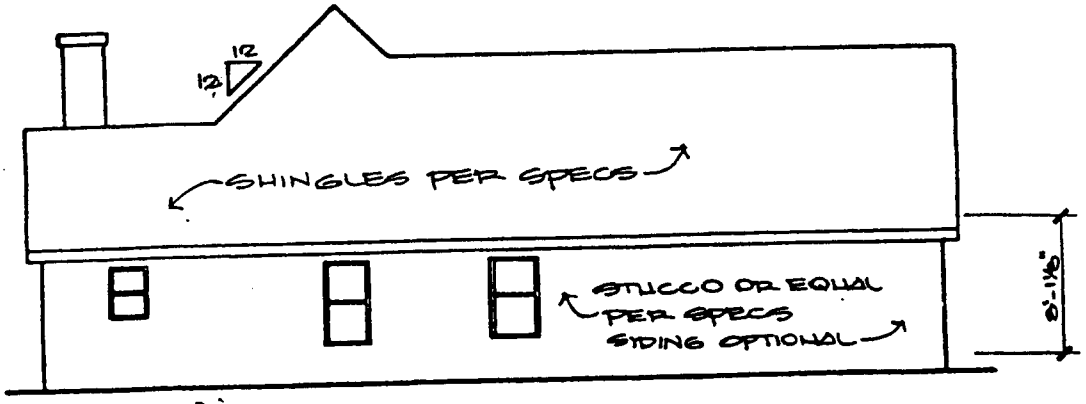


REAR ELEVATION

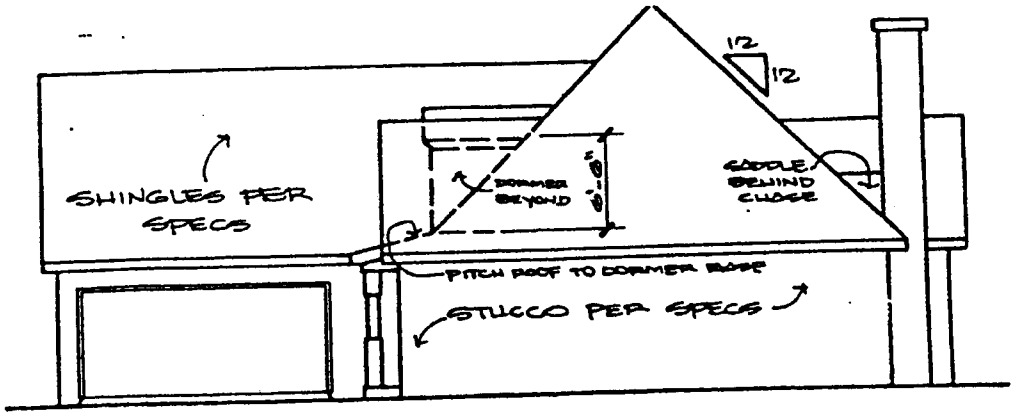
ALL OVERHANGS TYPICAL 18" FROM FRAME LINE ON BRICK AREAS AND 12" FROM FRAME LINE ON SIDING/STUCCO AREAS

NOTE:

ROOF FRAMES OFF TOP OF CEILING JOIST, RAFTERS STACK WITH CEILING JOIST. CEILING JOIST STACK WITH STUDS



LEFT ELEVATION



RIGHT ELEVATION

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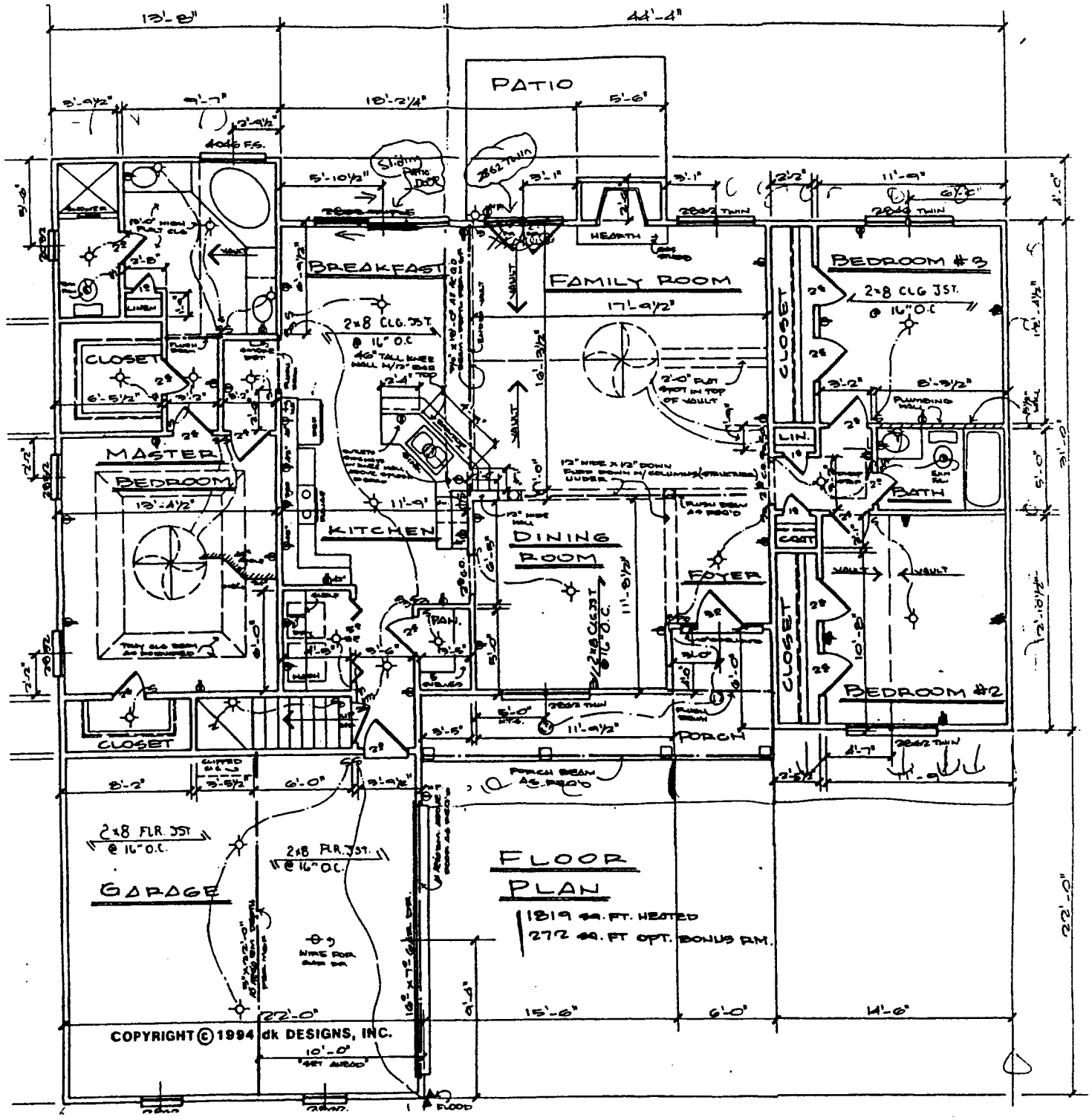

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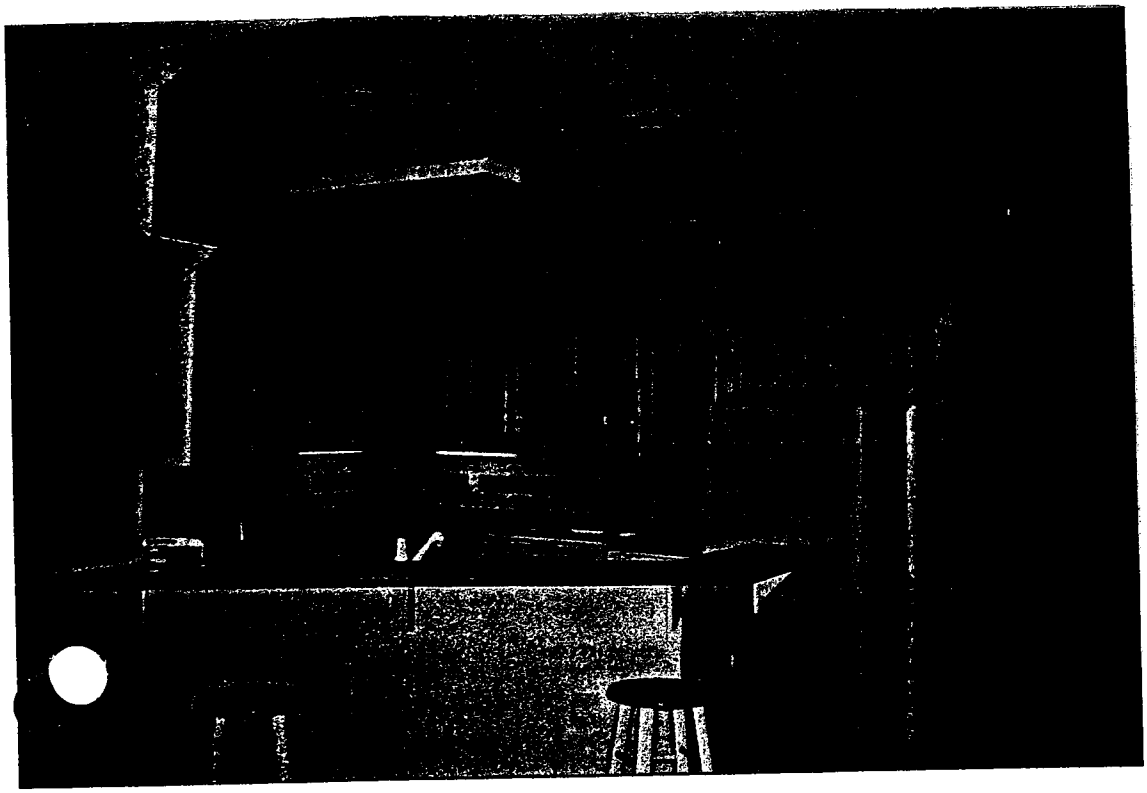

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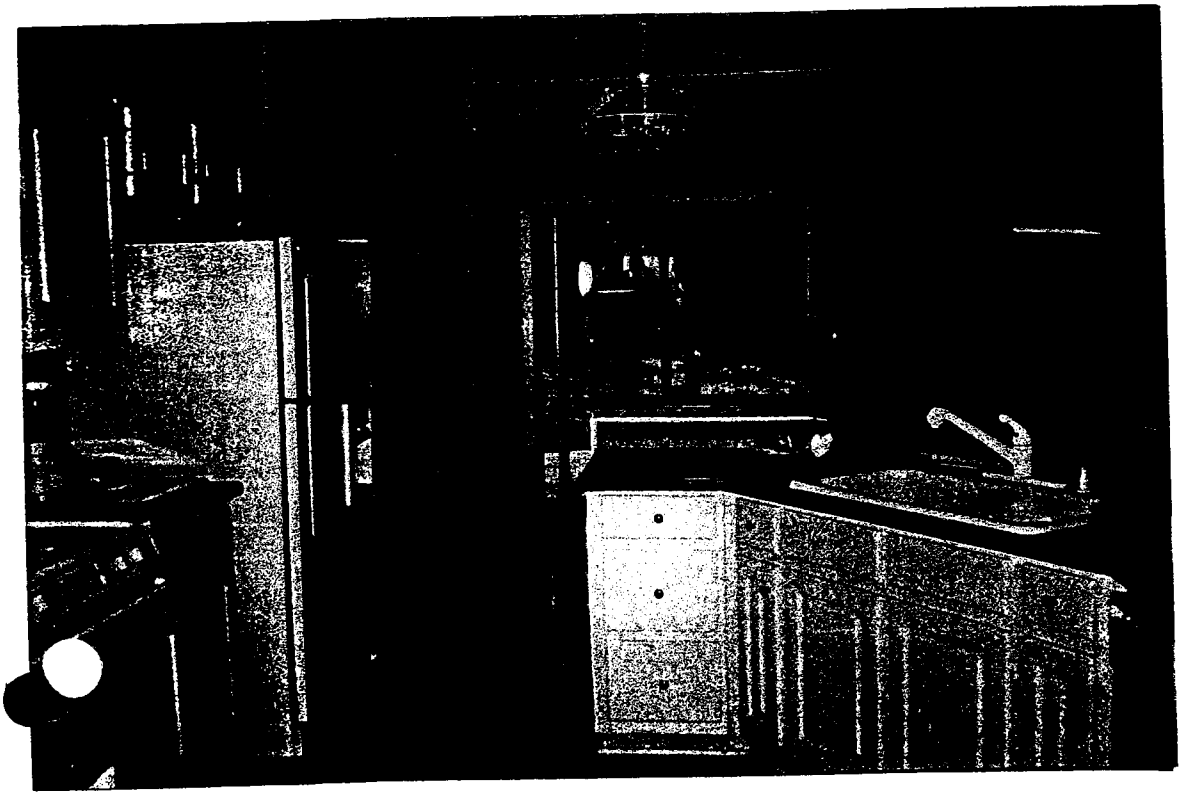

3. COUNTRY TRADITIONAL HOUSES (cont'd)

3.12 United States of America Traditional House

Gross Floor Area

The gross floor area is made up as follows:

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Total Area	234.33m2

For the purposes of this study, only the ground floor of occupied, heated space is considered (169m2). Also the Bonus room in the attic was not built, although designed.

	Item Description	Amount (USD)	Rate/m2 (USD)	% of Total	Notes
1	Temporary Work	3,365	19.91	3.1%	
2	Foundation Work	8,843	52.33	8.3%	
3	Carpentry	20,480	121.18	19.1%	
4	Roofing and Sheet Metal Work	5,340	31.60	5.0%	
5	Doors and Windows	6,536	38.67	6.1%	
6	Exterior Finishes and Plaster	7,060	41.78	6.6%	
7	Interior Finishes	16,079	95.14	15.0%	
8	Equipment and Fittings	5,328	31.53	5.0%	
9	Miscellaneous Work	3,035	17.96	2.8%	
10	Electrical Installation	9,815	58.08	9.2%	
11	Plumbing, Drainage Work	900	5.33	0.8%	
12	Design and Permits	3,220	19.05	3.0%	
13	Supervision	290	1.72	0.3%	
14	Site Expenses	500	2.96	0.5%	
	Total Trade Cost	**90,791**	**537.22**	**84.7%**	
	General Overhead & Profit (18.0%)	**16,342**	**96.70**	**15.3%**	
	Total Construction Cost (USD)	**107,133**	**633.93**	**100.0%**	