

THE UNIVERSITY OF MANITOBA

DEPARTMENT OF CITY PLANNING

---

The Viability of Single Family Detached Housing

In

Northern Ontario

A Thesis Submitted To

The Faculty of Graduate Studies

In Candidacy For The Degree Of

Master Of City Planning

By

Reginald Leonard Nalezty

December 1984

THE VIABILITY OF SINGLE-FAMILY DETACHED  
HOUSING IN NORTHERN ONTARIO

BY

REGINALD LEONARD NALEZYTY

A thesis submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
of the degree of

MASTER OF CITY PLANNING

© 1985

Permission has been granted to the LIBRARY OF THE UNIVER-  
SITY OF MANITOBA to lend or sell copies of this thesis. to  
the NATIONAL LIBRARY OF CANADA to microfilm this  
thesis and to lend or sell copies of the film, and UNIVERSITY  
MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the  
thesis nor extensive extracts from it may be printed or other-  
wise reproduced without the author's written permission.

"Indeed, location alone may be the biggest factor of all in deciding the value of a house and what we pay for shelter. For, although a dollar generally buys the same amount of food anywhere in Canada (except for the obvious exception of the Far North), a given number of dollars spent on housing may buy either a great deal or a very little, depending upon where it is spent."

Alexander Laidlaw

"Housing You Can Afford"

ACKNOWLEDGEMENTS

The author wishes to thank, first, Dr. Greg Mason, of the Institute for Social and Economic Research, who acted as advisor, and committee members, Professor Basil Rotoff and Dr. Kent Gerecke, all for the comments, criticisms, and recommendations which assisted greatly in the assembly of this work in an organised and coherent manner.

Thanks are also due to the following persons for their co-operation and advice in assembling the building cost data which was an essential part of the research: Louis Becotte, Thunder Bay Harbor Improvements Ltd.; Mel Peterson, Peterson Electric Ltd.; Mel Harnett, Harnett Mechanical Services Inc.; Alan Wing, A. J. Wing and Sons Construction Ltd.; Olavi Viirtanen, Axelson's Plumbing and Heating Ltd.; Jim Matson, Thunder Bay Heating and Ventilating Ltd.; Dave Grabba, Gasparotto Construction Ltd.; Bill Adams, Herman Kotthaus, Herb Litterscheid; to Arnie Salo, for the loan of his old union agreements; and to Ted Castonguay and Debbie Lebel, for the preparation of the final copy.

Finally, special thanks are due to Lee Ann Nalezty, for her encouragement, criticism, patience, impatience, and for assuming all of the responsibilities that wives must take on in order to propel often somnolent husbands into completing their half-finished projects.

TABLE OF CONTENTS

	<u>PAGE</u>
ACKNOWLEDGEMENTS.....	1
INTRODUCTION.....	6
- The Concept of Affordability.....	9
- Affordability of Housing and Northern Small Town Economic Development.....	10
- The Research Programme.....	10
 <u>CHAPTER</u>	
1    METHOD OF INVESTIGATION.....	12
1.1    General Description.....	12
1.2    A Time Series Analysis of Construction Costs For A Fully-Detached Single Family House.....	12
1.2.1.    Selecting the Plan.....	12
1.2.2.    Drawing Preparation.....	13
1.2.3.    Establishing the Range.....	14
1.2.4.    Construction Cost Data: Collection and Assembly.....	17
(a)    Determining Labour Requirements....	17
(b)    Determining Material Requirements..	24
(c)    Determining Material and Labour Costs.....	24
1.3    Establishing Applicable Mortgage and Wage Rates.	27
1.3.1.    General Comments.....	27
1.3.2.    Determining and Tracing Changes In Wages.....	27
1.3.3.    Assessing the Question of Affordability.....	29
1.4    Practical Applications: Nipigon, Ontario - A Case Study.....	31
1.4.1.    General Comments.....	31
1.4.2.    Developing a Survey.....	33
1.4.3.    How the Survey Was Conducted.....	34
1.4.4.    Survey Data: Method of Analysis.....	36

2	CALCULATIONS AND ANALYSIS OF DATA.....	38
2.1	Introduction.....	38
2.2	Construction Costs, Mortgage Payments and Debt Ratios Based Upon Gross Income - 1963, 1973, and 1983.....	38
2.2.1	Determination of Construction Costs.....	38
2.2.2	Wage Rate Determination.....	44
2.2.3	Ownership Costs 1963.....	44
2.2.4	Ownership Costs 1973.....	47
2.2.5	Ownership Costs 1983.....	49
2.3	Mortgage Debt-to-Income Ratios - Based Upon Net Income - 1963, 1973, and 1983.....	52
2.4	Resident Survey - Town of Nipigon, Ontario.....	55
2.4.1	The Size of the Sample.....	55
2.4.2	Basic Characteristics of Sample.....	55
2.4.2.1	Family Make-up.....	57
2.4.2.2	The Ages of Respondents.....	57
2.4.2.3	Tenure.....	58
2.4.2.4	Income.....	58
2.5	Some Comparisons Between Owners and Tenants.....	59
2.6	Nipigon, Ontario: A Desirable Place to Live?...	62
2.7	Perceptions of Costs and Affordability.....	65
2.8	Self-Built Housing and Opportunities for Savings.....	67
2.8.1	The Desire for Self-Built Housing.....	67
2.8.2	Opportunities for Construction Cost Reductions.....	70
2.9	Acceptability of the Design of the Study House.....	73
3	CONCLUSIONS, COMMENTS AND RECOMMENDATIONS.....	76
3.1	Overall Conclusions.....	76
3.2	Comments on the Study Results.....	78
3.3	Recommended Policy Directions.....	80

APPENDIX I..... 87  
APPENDIX II.....135  
SELECTED BIBLIOGRAPHY.....144

LIST OF TABLES

1.1	Summary of Selected Paper Mill Wage Rates: Northern Ontario.....	30
2.1	Summary of Total Construction Costs for a Single-Family Detached House - 1963, 1973, and 1983.....	39
2.2	Summary of Material Costs for a Detached Single-Family Dwelling - 1963, 1973, and 1983.....	40
2.3	Summary of Labour Costs for a Detached Single-Family Dwelling - 1963, 1973, and 1983.....	41
2.4	Component Construction Costs Expressed as a Percentage of Total Construction Costs - 1963, 1973, and 1983.....	42
2.5	Indexed Labour, Material and Overall Construction Costs (Based Upon 1963 = 1.00).....	43
2.6	Calculation of Net Income for a Typical 1981 Census Family (2 Adults, 2 Children): 1963, 1973, and 1983.....	53
2.7	Annual Mortgage Payments, Gross and Net Annual Incomes, Mortgage Payment to Income Ratios: 1963, 1973, and 1983.....	54
2.8	Survey Results: Comparisons of Selected Owner and Tenant Characteristics: Nipigon, Ontario.....	56
2.9	Monthly Rent and Mortgage Payments: Nipigon, Ontario...	61
2.10	Mean Ages and Periods of Residence for Survey Respondents - Nipigon, Ontario.....	64
2.11	Distribution on a Percentage Basis of the Means By Which Owners Would Expect to Complete Selected House Construction Activities.....	69
2.12	Frequency Distribution By Percentage of Respondent Perceptions of the Need For and Desirability Of Various House-Related Amenities.....	74



INTRODUCTION

This work was concerned with the issue of housing in the small towns of the Canadian Shield and, more specifically, it dealt with the settled region of Northwestern Ontario.

As one of its aims it sought to demonstrate that, when compared to changes in general incomes, the construction cost for a single-family detached dwelling had not increased measurably within the Northwestern Ontario region over the twenty-year period from 1963 to 1983.

Its second purpose was directed towards verifying a conclusion opposed to those general conclusions of metropolitan area-centred research which lead one to assume that detached housing, because of its high cost in those large cities has become universally "unaffordable" to the majority of this country's population. In short, it sought to verify that the single-family detached house continues to fall within the financial capabilities of the wage earners employed within the northern resource-based small-town part of the Province of Ontario.

Northern Ontario is typical of much of the mid-northern regions of Canada in that it is sparsely populated, the majority of population centres are widely separated and small (under 10,000), and the regional economy is resource-based. While, as an area it covers approximately 203,000 square miles, and comprises 60 percent of Ontario's land mass, northern Ontario accounts for only 9 percent of the province's population.<sup>1</sup> The population located in the area's

---

<sup>1</sup>Canadian census data for 1981 showed a provincial population of 8,625,105 while the total for all of northern Ontario was only 775,058.

only five major population centres (i.e. over 20,000)<sup>2</sup> accounts for 50 percent of the regional total. Thus, while approximately 384,000 people inhabit the small towns of northern Ontario, not an insignificant number by any means, they in fact account for only 4½ percent of the provincial population. In economic terms, the region relies by-and-large upon forestry and mining activity, and generally with the exception of some railway towns, the small towns (most often not exceeding 5,000 in population) have some facet of activity related to these two as their basis for their existence.<sup>3</sup>

Given the overwhelming provincial population imbalance that favours the south, the scattered northern settlement pattern, and the overall small size of its communities, it is not surprising that the regions of Canada typified by northern Ontario have not played any significant role in national housing policy.<sup>4</sup> In housing,

---

<sup>2</sup>These centres are Sudbury, Sault Ste. Marie, North Bay, Timmins, and Thunder Bay, and their combined population as listed in 1981 census data was 390,668.

<sup>3</sup>Government of Ontario, Department of Treasury and Economics, Regional Development Branch; The Northwestern Ontario Region Development Programme - A Progress Report, (Toronto: 1969). This publication noted that, in 1965, 68 percent of all jobs in northern Ontario were wood, paper, and allied trade oriented, and that 69 percent of all manufacturing in the region was wood oriented. The comparable figure for southern Ontario was 6 percent, and for the province as a whole - only 8 percent.

<sup>4</sup>Central Mortgage and Housing Corporation. Canadian Housing Statistics - 1961, (Ottawa: March 1962). In fact, the only reference to any housing policy that related specifically to these regions and encountered during the research, was a notation in this publication that by Order-in-Council, on and after 20 September 1961, all applications for NHA loans in one-industry towns became subject to a guarantee by the industry.

governments - federal and provincial - respond to, focus their attention upon, and direct their research towards, "problem" areas affecting proportionately large sectors of the population and having major "vote-getting" potential. The mid-northern regions of Canada unfortunately meet none of these criteria.

In Ontario, research has concentrated almost exclusively upon "southern" Ontario, where massive development and inward migration to major centres has had the effect of escalating house prices to the extent that detached dwellings in the \$100,000. price range appear to have become the norm rather than the exception. The problem insofar as the small communities of northern Ontario are concerned, is that the results of Toronto, southern Ontario, and other metropolitan-oriented research that regularly point to this increasing unaffordability of detached housing, have generally been interpreted by policy-makers as having universal application<sup>5</sup>, notwithstanding the fact that they are more-often-than-not irrelevant in this "northern" context. The personal interpretation by the so-called average Canadian, regardless of where he or she lives, has generally been governed by these research results - hence the widespread "perception" that the single-family detached dwelling has become universally unaffordable to the average worker, and the resulting initiatives aimed almost exclusively at higher density accommodation. This question of affordability within the "northern" context has never been separately addressed. As a result towns like Nipigon, Red Rock, or Manitowadge are in an overall sense, treated no differently than Toronto or Hamilton although differences can be as dramatic as night and day.

---

<sup>5</sup> Programmes such as the Assisted Rental Programme (ARP), and the Assisted Home-Ownership Plan (AHOP) were examples of the type of solution that such research produced (i.e. policies aimed at alleviating and addressing the problems of the major population centres.)

### The Concept of Affordability:

"Affordability" or more often "unaffordability" as applied to the realm of housing has, over time, continued to be a consistent and persistent topic for discussion and debate amongst politicians, government officials, social scientists and planners, architects, special interest groups, and what we might term just "average" citizens. Each has examined affordability with specific goals in mind, with different biases arising out of selected and specialized knowledge, and within specific economic framework. Each in turn, has drawn his own conclusions as to the affordability of housing and each of these has been coloured by the criteria against which affordability has been examined. The fact is that, although it has been analysed within mathematical frameworks, and against various economic and sociological backdrops, providing "affordability" with a definition or even a set of generally defining guidelines having universal application is an impossible task.

The precept that underlies this research is this view that neither "affordability" nor "unaffordability" can be quantified with any acceptable degree of universality. Both, rather, if not entirely so are highly normative "concepts" to which each person gives his or her own definition based upon influences as personal, diverse, and intangible as personal values, political and/or moral philosophies, economic circumstances past and present, and perceptions of societal norms. In a nutshell, the limits of affordability are generally set by individually established parameters and individually established levels of expectation.

With regard to housing, because of their need for a quantifiable means for determining the limit of affordability, lenders and government agencies have established that a comparison of gross rent to gross income comprises a proper means for measurement. There appear to be no reasons other than empirical ones for having chosen the now generally accepted gross rent-to-income ratio of 0.30 as the ratio beyond which a cost for

accommodation is deemed unaffordable.

Since the gross rent-to-income ratio is the generally accepted means for measuring affordability of housing and the figure of 0.30 is the accepted ratio defining the upper limit for affordability, this work has used these as well. While admittedly not at all responsive to those normative elements discussed earlier, this "definition" is in fact mathematically quantifiable, and does allow data to be subjected to time-series comparisons and to be compared to that of other research.

#### Affordability of Housing and Northern Small-Town Economic Development:

Many of the small northern Ontario towns have recently either formed economic development boards or commissions, or have charged municipal officials with the responsibility for attracting new business to their communities. While these centres may have other major obstacles to overcome in meeting their objectives for new development, a strong factor working in their favour could very well be the fact that the home that may not be considered affordable in Mississauga, for example, is affordable in the northern centres such as Nipigon, Terrace Bay, Hearst or Red Lake. As such, while positive results arising out of this research may not address the immediate and pressing concerns of provincial or federal policymakers, whose interests generally lie in the large metropolitan areas, for municipal politicians in those small northern centres, they could be an important aid in their attempts, not only to expand their economic bases, but to maintain existing ones.

#### The Research Programme:

The work, itself, was conducted in two stages. The first of these consisted of the preparation of detailed cost estimates for a basic single-storey detached house for the years 1963, 1973, and 1983. Figures for these estimates were obtained from searches

of contractor records and estimates, manufacturer and supply-house catalogues and established construction estimators' manuals. The construction costs were amortised at mortgage rates applicable during each of those three years and the resulting payment schedules were compared to average monthly and annual wages paid in the paper industry at the time.

The second phase of the research involved the examination of the results of a mail-out survey conducted in the Town of Nipigon, Ontario. The intention of this part of the work was to obtain some means for acceptance or verification of the results of the previous section and, as well, to provide a means for exposing some of the facts that serve to distinguish the housing markets in the small northern Ontario centres, such as Nipigon, from those of the large metropolitan cities in Canada.

CHAPTER 1: METHOD OF INVESTIGATION1.1 General Description:

The task of collecting and assembling data consisted of two major processes. The first of these was composed of a series of essentially arithmetic computations tracing the cost of a fully-detached single-family house, together with wages and mortgage interest rates for three selected study years which covered, in all, a twenty-year time span.

The second major element in the research involved the development and distribution within a northern community of a questionnaire which solicited from individual households particular demographic, financial and other housing-related information. This data was required to allow the results of the first section of the research to be applied within the context of a small, resource-based community typical of the paper mill, mining, and railway towns found within the Shield areas of northern Ontario and Quebec.

1.2 A Time Series Analysis of Construction Costs of a Fully-Detached, Single-Family House:1.2.1 Selecting the Plan:

In order to analyse the changes in the cost of constructing a typical detached house, it was necessary, as a first step, to select a design that is reflective of house construction during the time-frame selected for study. To this end, a design was selected from a Central Mortgage and Housing Corporation publication which was in general circulation during the 1950's and 1960's.<sup>1</sup>

---

<sup>1</sup>Central Mortgage and Housing Corporation, Small House Designs, (Ottawa: 1958). This is a collection of house designs depicting floor plans, elevation views and perspective renderings which first appeared under this name in 1950. The early versions were revised three times prior to the 1958 version which remained in circulation until the early 1970's when it was replaced by a new, reduced, much less imaginative publication entitled Modest House Designs. This latter publication, which is still available, unlike its predecessor

The plan selected detailed a single-storey, three-bedroom house containing 1,013 square feet of floor area built over a full basement.<sup>1</sup> Because of the fact that the floor area of this house is less than 1,060 square feet, it would have qualified an owner for participation in a federal government plan known as "The Small Homes Loans Programme" which was intended to be of benefit to "those who had been squeezed out of the housing market by the upgrading in the quality of NHA home building".<sup>2</sup> Since the plan selected fell within the scope of that programme's criteria, it was assumed to be typical of what would, ultimately, have proven to be a moderately priced home.

#### 1.2.2 Drawing Preparation:

Once the design had been selected, it was necessary to complete basic drawings showing plan and elevation views of the house, drawn to a scale of one-quarter inch per foot. These drawings were then used to prepare the lists of materials and elements of labour that made up the construction cost estimates that were subsequently completed.

---

which appears to have been targeted at prospective individual owners, is aimed at small building contractors and "mini-developers".

<sup>1</sup>The plan was chosen because of its relative simplicity. This made the estimate preparation less complicated and, thus, the final product more accurate. A copy of this plan together with elevation views and a perspective rendering appear as a part of Appendix II.

<sup>2</sup>Central Mortgage and Housing Corporation, Housing In Canada 1946 - 1970, A supplement to the 25th Annual Report of Central Mortgage and Housing Corporation, (Ottawa: 1970), p. 21 - 22.



### 1.2.3 Establishing the Range:

In establishing the study time-frame, it was decided to use 1983 as the upper limit of the range for the obvious reason that all material prices would be readily obtainable and exact. Since the resulting construction costs would be current, they would be a more useful basis for comparison than those of even a year earlier.

At the other end of the scale, 1963 appeared to be an appropriate choice for a lower limit for a number of reasons. First, the technology in general use in the housebuilding industry at that time has remained, to all intents and purposes, virtually unchanged. Thus those cost figures calculated for materials and elements of labour applicable at that time reflect prices that apply to construction practices commonplace in 1983, and allow for comparisons to be made that are essentially free from distortions induced by technological advances.<sup>1</sup> Had the lower limit of the study range been extended another ten years, however, the distortions that would have been introduced would have made comparisons without major and complex corrections suspect if not entirely invalid.

As well as the technological changes that manifested themselves during the 1950's and, in large part, as a direct result of them, the late 1950's and early 1960's mark a period of significant change

---

<sup>1</sup>It should be pointed out that some changes in materials and methods have, indeed, occurred. These have been generally few and, in the context of the overall construction process and final cost, not overly significant. For example, prefabricated wood trusses have virtually replaced built-in-place roof construction as the norm for all but the most complicated of roof designs. As well gypsum-core drywall is now used as a matter-of-course in place of lath and plaster construction for interior wall finishing. Even these two items, however, were neither unknown nor entirely unusual in 1963 and had, in fact, already achieved at least some popularity both with housing contractors and individual owner-builders.

in residential architectural style.<sup>1</sup> By 1963, however, the single-storey bungalow often sporting a masonry or siding front with stucco side and rear walls, horizontal sliding windows and aluminum storm doors - a basic style that continues to be a standard - was well-established trademark of the Canadian streetscape.

Thus, insofar as the "product" is concerned, the selection of 1963 as the lower limit of the study range essentially allowed "oranges to be compared to oranges", something that would not have been possible had an earlier lower limit been established. In addition to this, the period of the early 1960's is not sufficiently distant that raw cost data is, in general, no longer available. Had the range been extended beyond this point, however, it is doubtful that any useful figures would still be available.

There were, as well, other reasons for establishing the study limit as 1963 - reasons certainly as important as those related to the state-of-the-art of the construction industry. By today's standards, 1963 is reflective of a period of relative prosperity and overall economic stability. Mortgage rates experienced only marginal changes during the period from 1959 to 1967,<sup>2</sup> total housing

---

<sup>1</sup>Unlike the following two decades, the period from 1950 to 1960 saw a large number of significant changes in labour practices and materials used in the housebuilding industry. For example, panel-type doors gave way to slab-type doors and pre-hung interior and exterior doors replaced the old practice of hanging doors in-place. Storm windows became passé as double-hung wood windows were almost entirely replaced by aluminum sliding windows and sealed units and ready-mixed concrete replaced site-mixed material. This period saw, also, the general disappearance of ship-lap lumber as wall, floor and roof sheathing and its replacement by spruce and fir plywood.

<sup>2</sup>Figures provided by The Royal Bank of Canada, Cumberland Street Branch, Thunder Bay, Ontario, and extracted from actual mortgage files list rates of 6 percent in 1959 and 7 percent in May, 1967. By 1969, the interest rate had risen to 9 percent.

starts were increasing,<sup>1</sup> and the number of single-detached starts still exceeded the number of apartment starts<sup>2</sup> on a national basis. As well, wage increases were moderate<sup>3</sup> and the prices of building materials were generally stable.<sup>4</sup>

Results of assessing raw data related to wages and material costs and further examination of other data contained in Central Mortgage and Housing Corporation's "Canadian Housing Statistics" publication showed a division of the study range into two equal intervals to be reasonable. Because all of the component cost increases are, on an annual basis, only marginal, meaningful conclusions can only be drawn from analysis of cumulative totals.

---

<sup>1</sup>The ten year period from 1953 to 1962 exhibits a mean number of housing starts in Canada of 127,437 with a standard deviation of 17,938. For the period from 1964 to 1972, on the other hand, the mean number of housing starts was 190,245 with a standard deviation of 36,833. The total of 148,624 for 1963 would appear to mark the beginning of a period of accelerating housing activity. Source: Central Mortgage and Housing Corporation, Canadian Housing Statistics - 1973, (Ottawa: March, 1974).

<sup>2</sup>The ratio of starts of single-detached units to apartments during the period from 1957 to 1961 exhibited a mean value of 2.14. While, by 1963, this ratio had dropped to 1.29 (which was also the mean value for the period from 1962 to 1966), the majority of housebuilding (i.e. in the single-detached sector). The mean for the period from 1967 to 1971, on the other hand, dropped to 0.82 and did not rise above 1.00 until 1972 when it reached 1.11. Source: Canadian Housing Statistics - 1972.

<sup>3</sup>CMHA, Canadian Housing Statistics - 1968, p. 58, Table 79. Average wage increases over the period from 1958 to 1963 were 6.80 percent annually.

<sup>4</sup>Ibid., p. 60, Table 84. Building material price increases from 1961 to 1967 averaged 2.80 percent per year.

In this case, the resulting ten-year interval divides the range at a point that coincides with the height of a period of accelerating economic growth and burgeoning housing activity. This division occurs, as well, sufficiently distant from the lower limit (1963) to allow comparisons to be made that are free from the influence of any short-term distortions not representative of overall trends.

#### 1.2.4 Construction Cost Data: Collection and Assembly:

Once all the parameters establishing the study range and intervals had been finalised, it remained to complete the construction cost estimates for the house selected for each of the three study years. For purposes of analysis and ease of assembly, construction costs were first separated into three elements, namely: labour, materials and equipment, and sub-trades.

#### 1.2.4 (a) Determining Labour Requirements:

The construction process was divided into a series of twelve basic areas of labour activity. These were as follows:

1. Foundations
2. Rough Framing
3. Exterior Finish Carpentry
4. Insulation and Drywall
5. Interior Finishing Carpentry
6. Floor Finishes
7. Interior Finishes
8. Exterior Finishes
9. Miscellaneous Items
10. Electrical
11. Plumbing
12. Heating and Ventilating

Further subdivisions of each of these followed to the extent that was necessary to allow individual tasks to be defined in as disaggregate a manner as possible. An example illustrating how this method was applied in the case of the foundations is as follows:

The process of constructing the building foundations was first broken down into three major components:

- (a) construction of the footings
- (b) erecting the foundation walls
- (c) placing the basement floor and weeping tile.

These were, then, analysed so as to further reduce each to a number of tasks that could be identified as being distinct and different from each other that had attached them specific and measurable material requirements,<sup>1</sup> and for which a man-hour requirement and specific trade definition could accurately be determined. In the case of the foundations, this second analysis produced the following breakdown:<sup>2</sup>

(a) Footing Construction:

	<u>Quantity</u>	<u>Trade</u>	<u>Time</u>
Form the footings	132 l.f.	Carpenter	3 @ 4½ hrs.
Place steel & concrete	6½ c.y.	Labourer	2 @ 2 hrs.
Remove forms	132 l.f.	Labourer	1 @ 1½ hrs.
Spread floor gravel	20 c.y.	Labourer	1 @ 8 hrs.

---

<sup>1</sup>"Material requirements" has been taken to mean a need for a definable quantity of a specific construction material in order to complete the particular task.

<sup>2</sup>Abbreviations used in the breakdown are as follows: lineal feet: l.f.; cubic yards: c.y.; pieces: pcs.

(b) Foundation Walls:

	<u>Quantity</u>	<u>Trade</u>	<u>Time</u>
Lay 10 inch block	1,300 pcs.	Mason	2 @ 32 hrs.
Mix mortar & carry block	1,300 pcs.	Labourer	1 @ 32 hrs.
Parge exterior of walls		Mason	1 @ 8 hrs.
		Labourer	1 @ 8 hrs.
Apply dampproofing		Labourer	1 @ 8 hrs.

(c) Basement Floor and Drainage:

Place and finish concrete	9½ c.y.	Cement Finisher	2 @ 12 hrs.
Place weeping tile	200 l.f.	Labourer	1 @ 8 hrs.

A similar process was applied to each of twelve major areas of labour<sup>1</sup> resulting in a list of seventy separate tasks and activities. Having identified the various tasks, the next step required that each of these have established for it a time requirement expressed in terms of man-hours necessary to complete the work involved.

In order to accomplish this, a number of approaches and checks were applied. As a first step, for those items where past experience would allow estimates to be made with a reasonable degree of authority and certainty, the writer made estimates of hourly requirements based both upon his experience in housebuilding and upon written records listing unit time and material requirements compiled for house construction projects in which he had participated.<sup>2</sup>

---

<sup>1</sup>These are classifications listed on page 14.

<sup>2</sup>It should be noted that over the past fourteen years, the writer has been involved directly in the construction industry both as an employee of a large contracting firm and as the proprietor of

These estimates, which were generally restricted to work involving carpenters and labourers, were first compared with figures shown in a number of estimators' manuals that have acquired general acceptance within the construction industry<sup>16, 17, 18, 19, 20</sup> and, then, finalised only after consultations with individual tradesmen experienced in their respective fields. In the case of the foundations, this process would have been applied to the work involving the forming and stripping of the footings, the placing of gravel, reinforcing, concrete and the applicaiton of dampproofing.

For those items that related to trades and skills, other than those falling under framing and finishing carpentry and general labour classifications, a slightly different process was used. Costing this work, which included such specialty areas as masonry, painting, and plumbing, involved, as a first step, consulting with

---

his own engineering and construction company. This involvement has required that he regularly prepare estimates to be used for tendering purposes and, as well, be responsible for on-site management of labour and expediting of construction materials.

<sup>16</sup> Walker's Building Estimator's Reference Book, 21st ed., (Chicago: Frank R. Walker Company, 1982).

<sup>17</sup> Dodge Construction Systems Costs 1982, (New York: McGraw-Hill Incorporated, 1982).

<sup>18</sup> Coert Engelsman, 1981 Residential Cost Manual-New Construction, Remodelling and Valuation, (New York: Van Nostrand Reinhold Company, 1981).

<sup>19</sup> Idem, 1981 Engelsman's General Construction Cost Guide, (New York: Van Nostrand Reinhold Company. 1981).

<sup>20</sup> George Bradford, Advance Estimating, (Toronto: Advance Estimating Ltd. 1980).

various contractors and individual tradesmen in order to establish preliminary estimates that would provide a basis for quantifying the amount of work that one could expect to be done per man-hour. These figures were then inserted into the estimate; the final product was checked against figures in estimating manuals; then, verified once again - this time within the context of the house being studied - through consulting with various tradesmen and persons involved in that particular part of the construction industry.

The work related to the construction of foundations that was handled in this fashion involved the laying of the blocks, the mixing of mortar and the parging of the basement walls. The man-hour figures for these were derived via the following process:

The concrete block requirement was established through examination of the scale drawings. The plan showed 132 lineal feet of foundation wall. Based upon a wall consisting of twelve courses, the block requirement is 1,188 pieces together with 100, or so, being required for construction of the front exterior steps. Building Code regulations require that the blocks be ten inches thick and estimators' manuals gave the following data:

(a) that 7.5 cubic feet of mortar would be required for every 100 square feet of wall; that one mason should lay approximately 150 units per eight-hour day; that every 100 blocks should require six to seven hours of a mason's time and an equal time input by a general labourer.<sup>1</sup>

---

<sup>1</sup>Walker's Building Estimators' Reference Book, 21st ed.,  
p. 374.



(b) based upon basement work using 3,840 pieces of eight-inch block, jointed one side only, joint reinforcing every third course, six pilasters, anchor bolts at four-foot centres, and one coat of parging, labour requirements were: 170 mason-hours (i.e.: 180 blocks per eight-hour day) and 190 labour-hours.<sup>1</sup>

(c) consultation with a masonry contractor<sup>2</sup> and examination of an estimate prepared by his firm showed that an average figure of 180 to 200 pieces of eight-inch block per mason per eight-hour day was generally used by him for estimating purposes.

Based upon all of the foregoing, an average figure of 165 units per mason per day was used. As both reference manuals had listed labourer-hours equal to mason-hour requirements, the same procedure was applied in this work. These figures, which would include set-up and scaffolding time, were found to be generally acceptable and accurate by a number of individual tradesmen who were subsequently consulted.

The result, thus, showed placement of 1,300 pieces of ten-inch block would require 7.87 mason-days. This was roughly equivalent to two men working four days and two labourers were listed for five working days. The additional day for the labour crew allowed for moving onto and off the site as well as time for final clean-up.

---

<sup>1</sup>Advance Estimating, p. 174. As these figures are for eight-inch concrete block, an adjustment to this figure could be made to reflect the additional work required when ten-inch block is used. Another means would be to check figures for eight-inch block used in other manuals. In this case, Walker's Building Estimators' Reference Book lists a figure of 150 to 170 units per day as being average.

<sup>2</sup>In this case, the firm consulted was Dante Gasparotto Ltd.

This general procedure involving the systematic breaking-down of the labour into a large number of small individual units and classifying them according to the trade involved, reduced the possibility of major error in the final totals.<sup>1</sup> Also, since the magnitude of each was small<sup>2</sup> (no single item consisting of more than seven per cent of the total man-hour requirement) errors that might have been introduced due to estimates that were either overly generous or too low would tend to have a minor effect upon the final total. Using the house foundations as an example once again, an error of as much as twenty per cent in estimating the time required to lay the blocks could induce and increase (or decrease) in the final total by only 1.3 percent.

---

of Thunder Bay, Ontario.

<sup>1</sup>An alternative method often used is to simply apply costs on a unit price basis (e.g. dollars per square foot) (i.e. merely establish a figure for a particular item of work, say \$3.50 per square foot as a unit cost for the labour involved to complete the rough carpentry and multiplying it by the floor area. In housing, this is only really accurate in cases where the identical plan has been constructed under essentially identical conditions a number of times. For many companies, this is a common, valid and accurate means of estimating. For the purposes of this research, however, the unit price method was deemed unacceptable. Totals derived in that fashion would be suspect inasmuch as the influence of factors such as the complexity of the work, site conditions, management practices of the firm involved, or the degree of quality control exercised or demanded for the projects where such figures were obtained would be known. The effect of such factors could be significant. Thus, the method used in this work, while having some degree of subjectivity attached to it, is, in this case, the most accurate means of determining costs.

<sup>2</sup>The mean time requirement per labour item was 13.5 hours with a standard deviation of 16.23 hours.

#### 1.2.4 (b) Determining Material Requirement:

As stated in the preceding section, each labour item had, associated with it, a particular material requirement. The labour and material sections of the construction cost estimate were developed concurrently. Material quantities, determined by direct measurement of the scale drawings that had been prepared, were itemised separately along with the element (or elements) of labour associated with incorporating them into the house. As can be seen by the format of the cost estimate,<sup>1</sup> the material take-off was completed in the same sequence as that which would be followed in the actual construction. This was done in order to minimise the possibility of omitting any items. Development of the material list concurrently provided a check upon the completeness of each.

#### 1.2.4 (c) Determining Material and Labour Cost Figures:

Because the labour requirements were expressed in terms of man-hours and, further, classified by trade, the examination of cost figures proved to be a relatively straightforward process.

The Thunder Bay locals of each of the affected trade unions provided figures that listed wage scales and benefit schedules in effect during each of the study years. These were drawn from their file copies of the collective agreements in affect at those times. The use of a unionised labour rates served to further normalise the comparisons being made while, at the same time, totals derived through their use reflect maximum costs with which an owner would likely be faced in having a new house constructed by a general contractor. Furthermore, unlike many metropolitan areas of the country, they reflect costs which are typical of the industry as a

---

<sup>1</sup>See Appendix I for the detailed cost estimate.

whole within Northern Ontario.<sup>1</sup>

Once the wage rates for each of the affected trades for each of the three study years had been established, they were inserted into correct locations in the appropriate estimate. The extensions were then completed and final sub-totals and overall totals determined.

The determination of material costs for the years 1963 and 1973 was accomplished through the use of a number of separate sources. The problem of once again normalising the comparisons was overcome, in large part, through the use of building-supply catalogues published by the Shore Glass Company Ltd. of Winnipeg, Manitoba. In many cases, these allowed amounts for identical items, priced by the same firm, to be included in the estimates for each of the three study years.<sup>2</sup> Prices listed in the current (1983) catalogue are generally competitive with those to be found in northwestern Ontario and comparisons of earlier catalogue listings with prices obtained through examination of contractors' estimates from those years, indicate that this has been the case in the past as well.<sup>3</sup>

---

<sup>1</sup>Unlike most of the major centres in Canada, virtually all of the major participants in the construction industry (general construction firms) in northern Ontario employ unionised labour. This general rule applies within the housing sector as well. For example, during the time it was engaged in major housing and construction activity in northwestern Ontario, Nu-West Corporation of Calgary used unionised labour while, in its operations a few hundred miles away in Winnipeg, all of its housebuilding activity was conducted on a non-union basis.

<sup>2</sup>The catalogues referred to here continue to be published annually by this firm. The product line is now more specialised, concentrating, in large part, upon windows, doors and general mill-work items. Earlier versions, particularly in the early 1960's, list products such as paint, insulation, plywood, nails, sheathing and even floor tile in addition to items currently carried.

<sup>3</sup>Shore's 1963-64 catalogue lists 5/8" fir plywood at \$6.55 per sheet, while figures extracted two contractors' estimates of 1963 list prices of \$6.35 per sheet.

Prices for most of the items not listed in the Shore Glass Ltd. catalogues were obtained through examination of estimates of a general contracting firm.<sup>1</sup> Their records were used to determine costs for items such as concrete, sand and gravel, cement, dimension lumber and reinforcing steel as well as equipment rental rates.

The final two major sources of material-related price information were mail-order catalogues<sup>2</sup> which were used to provide cost data for miscellaneous items such as carpet and tile, plumbing supplies, newspaper advertisements<sup>3</sup> placed by building supply houses and listing prices for assorted construction materials.

The fact that all of these sources provided much overlapping information served, inadvertently, to create a means for verifying many prices of individual items and, in an overall sense, to confirm to the writer the overall accuracy of the final totals.

Because of the fact that construction methods and materials are basically unchanged from those of twenty years ago,<sup>4</sup> the estimate

---

<sup>1</sup>Much of the data was taken from records provided by Thunder Bay Harbour Improvements Ltd. of Thunder Bay, Ontario. This firm has been in operation for approximately seventy years and maintains copies of estimates compiled since the early 1930's. These are well detailed and were invaluable sources of costing information relating to both materials and labour.

<sup>2</sup>These were catalogues published by Eaton's Ltd. and Simpsons-Sears Ltd. and were provided by the Thunder Bay Historical Society, Thunder Bay, Ontario.

<sup>3</sup>The advertisements were extracted from copies of the Port Arthur News-Chronicle, Fort William Time-Journal and the Thunder Bay Chronicle-Journal.

<sup>4</sup>See Section 1.2.3 of this report.

format for each of the three years is identical.<sup>1</sup> Applicable cost figures and wage rates were simply inserted into the appropriate locations in order to arrive at the final sums.

### 1.3 Establishing Applicable Mortgage and Wage Rates:

#### 1.3.1 General Comments:

In order to assess the matter of affordability over the study period and any changes therein, it was necessary, as a first step, to settle upon an acceptable proxy through which "affordability could reasonably be measured". Since the research was being conducted within the context of, and was limited to, northern Ontario, it was decided that because it is such an integral part of both regional and local economies, that wages paid by the forest industry could serve as the yardstick by which construction and ownership costs would be measured.

#### 1.3.2 Determining and Tracing Changes in Wages:

The forest industry, as applied to the small towns of northern Ontario, consists of two basic sectors: the "woodlands" operations which involve wood harvesting and delivery, and the "mill" operation where paper or, more recently, wood stud production is carried out.

For a number of reasons, this study has used, for calculation purposes, a wage rate extracted exclusively from the paper-mill portion of the industry. In the past, woodlands activities have been sensitive to factors such as changing economic conditions,

---

<sup>1</sup>The only differences occur in the 1983 estimate which includes amounts to cover new basement insulation regulations specified by building codes and the now common practice of using 2" x 6" studs for the outside walls.

the size of mill stockpiles and climatic influences which have tended to produce significant numbers of economic ups-and-downs for many employed there. While these generally tend to even themselves out over time, selection of a particular representative wage rate for comparative purposes such as was required here, became difficult. As well, much of the work in woodlands operations is, and has been, done on a "piecework" basis, making income, to a large degree, a function of the effort which an individual employee is prepared to expend.

Essentially, the mill was seen as a more stable environment from which to draw wage data. Over the past twenty years, paper mills have maintained steady operations which, in turn, provided secure, year-round jobs returning reasonably good levels of income to the employees. Basic wages are paid, largely, on an hourly basis with some salaried positions. Salaries are not generally subject to extreme variations either between departments or between many management and production functions. In light of these factors, unlike one extracted from woodlands activities, a wage figure taken from the mill operation provides data that are, from year-to-year, stable and representative of incomes of a major segment of the workforce in northern Ontario. Owing to the high incidence of unionised labour in the region, this wage figure carries with it the benefit of reflecting not only the general income of those employed in woodlands activities of the paper companies, but also wages of persons working in other major areas of the economy such as mine, rail and hydro operations.

Two separate sets of wage rate figures were used for the calculations used in the following sections. The first of these represent averages of wages for four job classifications within a paper mill operation in northwestern Ontario. These were extracted from union agreements in effect during each of the study years.<sup>1</sup> The second figures represent average wages for all

---

newsprint mills in Canada for each of the years examined.<sup>1</sup> These latter figures provided checks upon calculations that used wage figures drawn from the union agreements.

### 1.3.3 Assessing the Question of Affordability:

The method used to measure changes in affordability consisted of a series of relatively straight-forward arithmetic calculations. These involved three basic elements, namely: the construction cost figures determined as described in Section 1.2.4, mortgage rates current in each of the study years and the wage figures derived by the methods noted in the previous section.

It was necessary, at the outset, to establish an annual wage for each of the study years. This was accomplished by a simple multiplication of the composite hourly wage rate calculated as part of the previous research by the forty hours that represent a regular work week, and a further multiplication of that total by fifty-two in order to arrive at an annual amount.

The second area of computation required that the house construction costs, previously determined, be linked to the wage totals in a manner that would allow the changes in both to be compared over time. This was accomplished using bank-supplied<sup>2</sup> information and CMHC publications listing mortgage interest rates for the study years, the corresponding construction cost totals and mortgage amortisation tables,<sup>3</sup> in order to produce monthly mortgage payment

---

<sup>1</sup>The figures were drawn from union agreements in effect at the Abitibi-Price Inc., Thunder Bay Division, paper mill. These are, essentially, the same as those for other mills throughout the region.

<sup>1</sup>Canadian Pulp & Paper Association, Human Resources Section, Wages and Earnings Data 1982, (Montreal: November, 1983).

<sup>2</sup>In this case, the information was extracted from records provided by The Royal Bank of Canada, Cumberland Street Branch, Thunder Bay, Ontario.

<sup>3</sup>Marvin Wenner, Monthly Payments For Mortgages, (Toronto: Computofacts, 1973).



TABLE 1.1Summary of Selected Paper Mill Wage Rates: Northern Ontario

<u>Job Title</u>	<u>Hourly Wage Schedule</u>		
	<u>1963</u> <sup>1</sup>	<u>1973</u> <sup>2</sup>	<u>1983</u> <sup>3</sup>
Journeyman 'A'	2.86	5.76	16.21
Woodroom Labourer	2.10	4.21	12.52
Coreman	2.86	4.30	12.80
Sulphite Utility Man	2.17	4.30	12.65
Shift Differential 4 - 12	.06	.15	.30
Shift Differential 12 - 8	.09	.20	.40
Average of Above Wages	2.35	4.64	13.78
Average of Above Wages Including Shift Differential	2.40	4.76	13.78
Canadian Pulp and Paper Association Average Wage <sup>4</sup>	2.48	4.86	13.96

---

<sup>1</sup>Source: Labour Agreement Between Abitibi Power and Paper Co. Ltd., Thunder Bay Division and Pulp Sulphite, and Paper Mill Workers' Union, Local 134; May 1, 1962 - April 30, 1963.

<sup>2</sup>Ibid: May 1, 1972 - April 30, 1973.

<sup>3</sup>Source: Labour Agreement Between Abitibi-Price Inc. and Canadian Paperworkers' Union, CLC; Local 134; May 1st, 1982 to April 30th, 1984.

<sup>4</sup>Source: Canadian Pulp and Paper Association, Human Resources Section, Wages and Earnings Data 1982; (Montreal, CPPA, 1982) p. 16.

schedules. These monthly figures were then expressed as percentages of gross monthly incomes. It was the changes in these rent-to-income ratios that were used as the first means by which affordability was gauged.

In addition to these calculations which used gross annual income as the basis for comparison, a second series of calculations was prepared corresponding to the first, but based, instead, upon an "after-tax" income. This set of data was obtained because it was felt that, for the purposes of this research, although the figures were likely not entirely comparable over the study range, it might provide a truer indication of the changes in real cost to owners since these figures would be based upon sums that represented reasonably closely, the in-pocket amounts that owners would have had as disposable income.

It was necessary, then, as well, to standardise the family unit whose income the figures would attempt to represent. Census figures for the Town of Nipigon, Ontario, where the survey portion of the research was conducted, showed an average of 3.54 persons per family. The family unit upon which the calculations were based consisted of two adults, only one of whom was employed outside the home, and two children, each under the age of 16 years. The after-tax incomes were determined by using the income tax returns and schedules that applied in each of the study years.

#### 1.4 Practical Applications: Nipigon, Ontario - A Case Study:

##### 1.4.1 General Comments:

As the final phase in the research process, and in order to meet the need to assess the calculations already completed, it was necessary to examine that work in the context of first-hand data collected in a typical northern Ontario community. The centre selected as the local in which this work was to be conducted was

Nipigon, Ontario - a town of approximately 2,500 people, located on the north shore of Lake Superior on the Trans-Canada Highway, approximately ninety kilometers east of Thunder Bay, Ontario.

While much of the town's labour force is employed in mill operations,<sup>1</sup> it was felt that since a significant number are also employed in jobs related to woodlands operations supporting the mills, along with others such as commercial fishing and service sector occupations, Nipigon would be representative of a situation that was a more demanding test of the theories being examined than would some other towns within the region with more homogenous economic bases.

It was expected that if these theories held in a situation where average wages were likely to be slightly below those used in the earlier research, they would certainly be applicable in centres in which a mill or mine operation was dominant in the local economy.<sup>2</sup>

---

<sup>1</sup>Major contributors to the labour force whose operations are resource-based is the paper mill operated by Domtar Ltd. in nearby Red Rock, Ontario; a plywood mill in Nipigon itself owned by MacMillan-Bloedel Ltd.; and the series of dams on the Nipigon River operated by Ontario Hydro.

<sup>2</sup>In the case of income, 1981 census figures list a mean family income of \$28,671. for Nipigon. This total is in keeping with other northern Ontario centres with some diversity in their economies such as Hearst (\$28,796.), Elliot Lake (\$28,002.), Fort Frances (\$27,954.), and Iroquois Falls (\$27,015.). Towns where the paper mill is, to all intents and purposes, the only employer, exhibit substantially higher figures (approximately 19 percent) i.e. Marathon (\$31,273.), Longlac (\$34,679.), Terrace Bay (\$36,617.) and Red Rock (\$31,136.).

Source: Statistics Canada, Census Divisions and Subdivisions: Selected Social and Economic Characteristics - Ontario; (Ottawa: Ministry of Supply and Services, July 1983.

#### 1.4.2 Developing a Survey:

A random survey of town residents was selected as the means by which this first-hand data, which was required, would be obtained. The questionnaire that evolved sought both hard demographic and economic data together with other information of a more general nature, but related to matters touching upon home-ownership and of significant importance to the overall research.<sup>1</sup>

While, as an overall purpose, this research sought to verify that homes are currently no less affordable to the average worker than they were during times past, a positive conclusion would, in itself, be, by and large, a meaningless finale to a hollow exercise if, first, it was determined that there was no apparent aspiration to home-ownership in these towns in general, and/or if the ability to build or own is significantly restricted.

In an effort to determine the degree of apparent affordability, questions soliciting rent, mortgage and income information were included as part of the survey. Also incorporated into the study were questions enquiring, not only as to whether or not respondents had any immediate plans of their own for constructing a home in Nipigon, or for having one constructed for them, but others asking whether or not and why they felt it advisable for others to do so. These latter queries were included in an attempt to gauge the degree of public confidence in the town's future.

Once again, even if questions of affordability could be resolved, and if individuals were generally desirous of becoming home-owners, without confidence in the long-term viability of the community, these first two items are of little consequence.

---

<sup>1</sup>A copy of the questionnaire used appears as Appendix II of this report.

As part of a final area of concern, information was sought that would assist in determining the degree to which direct out-of-pocket expenses to prospective owners could be reduced through their own involvement in the construction process, either in a direct sense, or through access to any "underground" or "cash" economy.<sup>1</sup> To this end, a series of questions enquired first as to whether or not owners wished to become actively involved in constructing their own homes, second, as to whether or not they felt they knew enough to do so, and, finally, through a series of multiple-choice queries, an actual distribution showing how they would expect to complete the various stages of construction were they to act as their own contractors.

#### 1.4.3 How the Survey Was Conducted:

In order to prepare residents for receipt of survey packages and to reduce the refusal rate to as low a value as possible, a trip was made to Nipigon approximately three weeks prior to circulation of the questionnaires in order to meet with the editor of the town's weekly newspaper. An article subsequently appeared in the

---

<sup>1</sup>It is common knowledge both to governments and to the public-at-large that an underground or second economy that is neither always particularly secretive nor inaccessible to persons in need of trades skills exists as an adjunct to the construction industry. The basic element in this economic system is the basis for payment for services rendered, namely: cash - cash which is neither traceable nor taxable. Currently, in Thunder Bay, where construction labour is highly unionised, a carpenter, plumber or electrician can generally be hired for a price of something in the order of \$12.00 to \$14.00 per hour on a cash basis. This represents a reduction of \$6.00 to \$8.00 from regular union rates which are currently about \$20.00, and a \$14.00 to \$18.00 per hour saving over the totals that a contractor would be forced to charge for the same work. It was the aim of this part of the work to determine the extent to which this was available in the town and the access of residents to persons who could be hired on a cash basis in centres such as this.

town paper advising of the upcoming survey, who was conducting it and why it was being done.

It was decided at that time as well that a mail-out programme would be used for circulating the survey packages. This work was simplified greatly by the fact that the Town of Nipigon does not have home-delivery mail service. Instead, all mail is picked up by residents from their mail boxes at the post office. Survey packages consisting of a letter of application, a self-addressed stamped envelope and a questionnaire<sup>1</sup> were left with post office staff and were distributed by them at random into the residents' postal boxes.

In total, ninety survey packages were distributed in this manner. This represented a minimum sample of 10.7 percent of all private dwellings in the town. Based upon 1981 census data which showed a total of 695 to be resident in the community with an average family size of 3.4 persons, the survey covered approximately 306 persons, or 11.7 percent of the total population.<sup>2</sup>

A period of two weeks following the distribution of the survey packets was allowed for return of the completed questionnaires. A total of twenty-six completed questionnaires were received during this period.

---

<sup>1</sup>See Appendix II for a copy of the questionnaire.

<sup>2</sup>The figure of 695 families is taken from 1981 census figures. However, other census data shows 665 families as being resident in Nipigon. A community profile produced by the Town, itself, lists 671 residential water consumers. The use of these town figures would produce a maximum sample size (i.e. assuming a 100 percent response rate) of 13.4 percent of all residences in Nipigon.

#### 1.4.4 Survey Data: Method of Analysis:

The completed questionnaires were coded in preparation for processing and computer-aided analysis by the author at the computer facilities of Lakehead University, Thunder Bay, Ontario. The analysis of this data, which follows in Chapter 2 of this report, consisted mainly of a series of cross-tabulations, frequency distributions and tests for statistical significance aimed at unearthing specific information that would serve to support the contention that the degree of affordability has not lessened measurably over time, and at verifying some of the wage and income data used in the first portion of the research.

#### 1.5 Summary:

The limitations of the research programme were such as to prevent any direct comparison between construction costs and incomes in the major urban centres such as Toronto and those in the small Shield towns as represented by Nipigon. Instead, the premise was accepted that in the absence of information to the contrary, detached housing there (Toronto, etc.) may very well be generally "unaffordable" to persons residing there and having incomes similar to the figures used for the purposes of this work.

What the work outlined concentrated upon, and was able to gauge with some success, was the change in owner-occupancy costs within the northern Ontario region over the twenty-year period covered by the study. This was accomplished through the time-series analysis of construction costs and mean annual wages, and the comparisons drawn between the two.

The data collected by means of the survey portion of the research programme was intended to serve as support for the conclusions taken from the cost-income comparisons. It attempted to determine whether or not the type of residence that gained acceptance as a "standard" home twenty years earlier, remained

acceptable in 1983, and to verify the accuracy of the income figures used for calculation purposes. Also, among other things, it aimed at assessing the extent of the demand for certain "extra" features often included in new houses and the degree to which residents of the area would be prepared to invest their own time, abilities, and labour, to achieve reductions in the construction cost.



CHAPTER 2: CALCULATIONS AND ANALYSIS OF DATA2.1 Introduction:

The calculations were organized into two general areas of investigation. The first of these involved organised constructions cost for the house being analysed and, then, comparing the mortgage payment schedules that those amounts would have generated with average earnings for each of the study years.

In the latter part of the chapter, responses to the survey were assessed, first, to obtain some indication of the degree to which they could be adjudged to be representative of the general population of Nipigon and, then, were examined further in order to unearth the implications, if any, which they held for the work done in the first part of the chapter.

2.2 Construction Costs, Mortgage Payments and Debt Ratios  
Based Upon Gross Income - 1963, 1973, 19832.2.1 Determination of Construction Costs:

The calculations and estimates described in Section 1.2.4, and shown in detail in Appendix I, were re-organised. These have been summarised in a tabular form as shown on Tables 2.1 to 2.5 which follow.

TABLE 2.1

SUMMARY OF TOTAL CONSTRUCTION COSTS FOR A DETACHED  
 SINGLE-FAMILY HOUSE - 1963, 1973, 1983

---

	<u>1963</u>	<u>1973</u>	<u>1983</u>
EXCAVATION AND BACKFILL	\$ 100	\$ 140	\$ 440
FOUNDATIONS	619	3,000	7,943
ROUGH FRAMING	3,112	5,408	12,477
EXTERIOR CARPENTRY	454	1,244	2,778
INSULATION AND DRYWALL	940	1,395	3,365
INTERIOR FINISH CARPENTRY	1,091	1,851	4,555
FLOORING	784	1,268	2,041
INTERIOR FINISHES	545	1,181	2,203
EXTERIOR FINISHES	237	465	1,055
PLUMBING	896	1,126	2,072
HEATING	906	1,254	2,387
ELECTRICAL	650	1,186	1,943
MISCELLANEOUS	375	766	2,153
PROVINCIAL SALES TAX	256	650	1,899
LABOUR OVERHEAD	277	835	3,213
	<hr/>	<hr/>	<hr/>
TOTAL CONSTRUCTION COST	\$12,242	\$21,769	\$50,524

TABLE 2.2

SUMMARY OF MATERIAL COSTS FOR A DETACHED SINGLE-FAMILY  
 DWELLING - 1963, 1973, 1983

---

	<u>1963</u>	<u>1973</u>	<u>1983</u>
FOUNDATIONS	\$ 1,028	\$ 1,530	\$ 4,450
ROUGH FRAMING	2,462	3,894	8,449
EXTERIOR CARPENTRY	263	798	1,587
INSULATION AND DRYWALL	744	939	2,147
INTERIOR FINISH CARPENTRY	908	1,424	3,413
FLOORING	739	1,158	1,784
INTERIOR FINISHES	286	460	764
EXTERIOR FINISHES	100	140	299
PLUMBING	664	856	1,302
HEATING	761	1,038	1,617
ELECTRICAL	511	856	1,133
MISCELLANEOUS ITEMS	65	95	178
PROVINCIAL SALES TAX	256	650	1,899
	<hr/>	<hr/>	<hr/>
TOTAL CONSTRUCTION COST	\$12,242	\$21,769	\$50,524

TABLE 2.3

SUMMARY OF LABOUR COSTS FOR A DETACHED SINGLE-FAMILY  
DWELLING

---

	<u>1963</u>	<u>1973</u>	<u>1983</u>
FOUNDATIONS	\$ 591.	\$1,470.	\$ 3,493.
ROUGH-FRAMING	650.	1,514.	4,028.
EXTERIOR CARPENTRY	191.	446.	1,191.
INSULATION AND DRYWALL	196.	456.	1,218.
INTERIOR FINISH CARPENTRY	183.	427.	1,142.
FLOORING	45.	110.	257.
INTERIOR FINISHES	259.	721.	1,439.
EXTERIOR FINISHES	137.	325.	756.
PLUMBING	232.	270.	770.
HEATING	145.	216.	770.
ELECTRICAL	139.	330.	810.
MISCELLANEOUS ITEMS	310.	671.	1,975.
LABOUR OVERHEAD	<u>277.</u>	<u>835.</u>	<u>3,213.</u>
TOTAL LABOUR COSTS	\$3,355	\$7,790.	\$21,062.

TABLE 2.4

COMPONENT CONSTRUCTION COSTS EXPRESSED AS A PERCENTAGE OF TOTAL CONSTRUCTION COSTS: 1963, 1973, 1983

	1963			1973			1983		
	MATL	LAB	TOTAL	MATL	LAB	TOTAL	MATL	LAB	TOTAL
EXCAVATION AND BACKFILL			0.8			0.6			0.9
FOUNDATIONS	8.4	4.8	13.2	7.1	6.7	13.8	8.8	6.9	15.7
ROUGH CARPENTRY	20.1	5.4	25.5	17.9	6.9	24.8	16.7	8.0	24.7
EXTERIOR CARPENTRY	2.2	1.5	3.7	3.7	2.0	5.7	3.1	2.4	5.5
INSULATION AND DRYWALL	6.0	1.7	7.7	4.3	2.1	6.4	4.3	2.4	6.7
INTERIOR FINISH CARPENTRY	7.4	1.5	8.9	6.5	2.0	8.5	6.7	2.3	9.0
FLOORING	6.0	0.4	6.4	5.3	0.5	5.8	3.5	0.5	4.0
INTERIOR FINISHES	2.3	2.1	4.4	2.1	3.4	5.5	1.5	2.8	4.3
EXTERIOR FINISHES	0.8	1.1	1.9	0.6	1.5	2.1	0.6	1.5	2.1
PLUMBING	5.4	1.9	7.3	3.9	1.3	5.2	2.6	1.5	4.1
HEATING	6.2	1.2	7.4	4.8	1.0	5.8	3.2	1.5	4.7
ELECTRICAL	4.1	1.2	5.3	3.9	1.6	5.5	2.2	1.7	3.9
MISCELLANEOUS ITEMS	0.5	2.6	3.1	0.4	3.1	3.5	0.4	3.8	4.2
PROVINCIAL SALES TAX	2.1		2.1	3.0		3.0	3.8		3.8
LABOUR OVERHEAD		2.3	2.3		3.8	3.8		6.4	6.4
TOTALS	71.5	27.7	100.0	63.5	35.9	100.0	57.4	41.7	100.0

TABLE 2.5

INDEXED LABOUR, MATERIAL AND OVERALL CONSTRUCTION COSTS (BASED UPON: 1963 = 1.00)

	1973			1983		
	MATL	LAB	TOTAL	MATL	LAB	TOTAL
EXCAVATION			1.40			4.40
FOUNDATIONS	1.48	2.48	1.85	4.32	5.91	4.90
ROUGH CARPENTRY	1.58	2.32	1.73	3.43	6.19	4.00
EXTERIOR CARPENTRY	3.03	2.33	2.74	6.03	6.23	6.11
INSULATION AND DRYWALL	1.26	2.32	1.48	2.89	6.21	3.57
INTERIOR FINISH CARPENTRY	1.57	2.33	1.69	3.76	6.24	4.17
FLOORING	1.57	2.44	1.61	2.41	5.71	2.60
INTERIOR FINISHES	1.61	2.78	2.16	2.67	5.55	4.04
EXTERIOR FINISHES	1.40	2.37	1.96	2.99	5.51	4.45
PLUMBING	1.28	1.16	1.25	1.96	3.31	2.31
HEATING	1.36	1.48	1.38	2.12	5.31	2.63
ELECTRICAL	1.67	2.37	1.82	2.21	5.82	2.98
MISCELLANEOUS ITEMS	1.46	2.16	2.04	2.73	6.37	5.74
PROVINCIAL SALES TAX	2.53		2.53	7.41		7.41
LABOUR OVERHEAD		3.01	3.01		11.59	11.59
TOTALS	1.55	2.32	1.77	3.31	6.27	4.12

### 2.2.2 Wage Rate Determination:

Most job classifications within a paper mill operate on a weekly shift rotation. That is: one week of days followed by one week of 4-12 shift and, then, one week of midnights. This procedure was taken into account in the determination of the average hourly wage figures listed in Table 1.1. The 1963 hourly wage, for example, was calculated in the following manner:

Week #1:	Day Shift	40h @ \$2.35 = 94.00
Week #2:	Evenings	40h @ \$2.41 = 96.40
Week #3:	Midnights	40h @ \$2.44 = 97.60
Total wages paid for three weeks		= \$288.00
Average hourly wage:		$\$288.00/120h = \$2.40$

The hourly wage figures of \$4.76, for 1973, and \$13.78, for 1983, were calculated in the same fashion. These figures were only marginally lower (i.e. less than three percent) than averages listed in Canadian Pulp and Paper Association publications<sup>1</sup> and, thus, appear to be an accurate reflection of the earnings of paper mill employees for those years.

### 2.2.3 Ownership Costs - 1963:

The first step in establishing an ownership cost for comparative purposes involved the determination of a total cost for the dwelling. This total cost involved, as well as the total for construction shown in Table 3.1,<sup>2</sup> an amount which would reflect, as accurately as possible, the cost of land at that time. It was impossible to obtain actual prices for residential property sales for the Town of Nipigon. Therefore, data was used from Central

---

<sup>1</sup>The reference, here, is to Canadian Pulp and Paper Association, Human Resources Section, Wages and Earnings Data 1982.

<sup>2</sup>See Appendix I for a complete and itemised estimate of construction costs.

Mortgage and Housing Corporation national housing statistics published for 1963. Since average land costs appear to have been relatively stable, on a national scale, over the years immediately prior to 1963, it was felt that a figure drawn from this source would provide a reasonable approximation of an average cost for a serviced lot in a small centre such as Nipigon, Ontario,<sup>1</sup> at that time. The cost figure of \$2,973.00 that was used was one that represented the average price paid for land based upon all single-detached dwellings on free-hold property.<sup>2</sup>

The total dwelling cost, then, was calculated in the following manner:

Total Construction Cost (as per Table 3.1)	\$12,242.
Average Land Cost	<u>2,973.</u>
Total Dwelling Cost	\$15,215. <sup>3</sup>

The next step required that a figure be established that would approximate an average downpayment in 1963 and, once again, the 1963 CMHC edition of Canadian Housing Statistics was used as the source. This publication listed a distribution of average downpayments according to incomes which showed that, for an income

---

<sup>1</sup>During the six-year period from 1957 to 1962, the average land cost for single-detached dwelling financed under the National Housing Act increased a total of \$276., from \$2,259. to \$2,535. - an average annual increase of two percent. (Source: CMHC, Canadian Housing Statistics - 1963; Table 107, p. 79.)

<sup>2</sup>Ibid: Table 107, p. 79.

<sup>3</sup>Ibid: Table 107, p. 79. This compares favourably with the national average of \$15,068. for all single-storey detached homes for 1963.



range of \$4,000. to \$4,999., the average downpayment was \$2,016.<sup>1</sup> Subtracting that amount from the total dwelling costs of \$15,215., left a balance of \$13,199. to be financed through a mortgage.

For the period in which construction would most likely begin in 1963, the average annual mortgage interest rate was slightly less than 6½ percent and was fixed at this rate over the twenty-five year term of the mortgage. The monthly payment required to finance \$13,199., on those terms, was \$88.43.<sup>2</sup>

Based upon all of the foregoing, the mortgage debt-to-income ration for 1963 was calculated as follows:

Monthly Mortgage Payment	\$ 88.43
Annual Mortgage Payment	\$1,061.16
Gross Annual Wage:	
\$2.40/h x 40h/week x 52 weeks/year	= \$4,992.00
1963 Mortgage Debt-To-Gross	
Income Ratio: 1,061.16/4,992	= 0.2125 <sup>3</sup>

---

<sup>1</sup>Ibid: Table 87, p. 67.

<sup>2</sup>Source: Marvin Wenner, Monthly Payments for Mortgages.

<sup>3</sup>This would appear to be slightly lower than the average for 1963. CMHC figures show the average gross debt-to-income ratio for 1963 was 0.214. However, for those with incomes between \$4,000. and \$5,999., this ratio was 0.261. For incomes between \$5,000. and \$5,999. the ratio was 0.241. The average dwelling cost for these groups was \$14,132.; the average downpayment was \$2,132. and, at 6¼ percent per annum, the average annual mortgage payment was \$1,046. The average mortgage debt-to-gross income ratio was 0.2009. Source: CMHC, Canadian Housing Statistics 1963, Table 87, p. 68.

#### 2.2.4 Ownership Costs - 1973:

The sequence of calculations, aimed at determining the mortgage debt-to-income ratio, followed the same basic procedure detailed in the preceding section with the exception that the means for determining a suitable land cost figure was varied slightly.

Although the source was the same as that used for the 1963 land cost determination,<sup>1</sup> the data in the 1973 edition was no longer organised according to the same format. Unlike the 1963 statistics, which listed land as well as construction costs for the country as a whole, only the 1973 edition listed these, first, for individual metropolitan and urban centres with populations in excess of 40,000,<sup>2</sup> and, then, a single figure representing the mean for all remaining urban and rural areas. It is the latter figure that has been used in this section.

The costs associated with constructing and owning a new home in 1973, then, were calculated as follows:

---

<sup>1</sup>Idem, Canadian Housing Statistics 1973.

<sup>2</sup>Ibid, p. 100, pg. 1.

Construction Cost <sup>1</sup>	\$12,769.00
Land Cost <sup>2</sup>	<u>3,187.00</u>
Total Dwelling Costs <sup>3</sup>	\$24,956.00
Less Average Downpayment <sup>4</sup>	<u>3,783.00</u>
Balance to be Financed by Mortgage	\$21,273.00
Average Mortgage Interest Rate for 1983	9 3/8% <sup>5</sup>

---

<sup>1</sup>See Table 2.1.

<sup>2</sup>CMHC, Canadian Housing Statistics 1973, Table 90, p. 75 (see listing for "Other Areas"). This figure would be more realistic in the "mill-town" context. The national average would, because of the fact that most housing starts took place in large urban centres where higher demand for land would result in higher prices, be significantly higher than land prices in smaller centres that did not experience any massive building boom.

<sup>3</sup>Ibid, Table 90, p. 75. This cost is slightly less than the national average of \$25,517. (and an average of \$25,020. for "Other Areas") although it is in keeping with the figures for incomes between \$9,000. and \$9,099., and \$10,000. and \$10,999. where prices between \$20,000. and \$24,999. were paid by 32 percent and 32 percent of those groups, respectively.

<sup>4</sup>Ibid, Table 106, p. 85. This is an average of the down-payments made by those in the \$9,000. to \$10,999. income range.

<sup>5</sup>Ibid, Table 79, p. 68. The calculated average for the year was 9.40 percent.

Based upon an average annual interest rate of 9 3/8 percent and a term of twenty years, the monthly payment necessary to finance a sum of \$21,273. was \$194.14.

The mortgage debt-to-gross income ratio for 1973 was, then, calculated as follows:

Annual Mortgage Payment:  $\$194.14 \times 12 = \$2,329.68$

Annual Gross Income:

$\$4.76h \times 40h/week \times 52 \text{ weeks/year} = \$9,990.80$

1973 Mortgage Debt-To-Gross

Income Ratio  $= 0.233$

#### 2.2.5 Ownership Costs - 1983:

In determining the total dwelling cost, again, the land component required a degree of interpretation and interpolation. In this case, the cost figure is a composite one that uses, as its base, estimates of the sale price for new residential properties that are expected to come onto the market in Nipigon, Ontario and Marathon, Ontario, sometime in 1984. These base figures were provided, in the case of Nipigon, by the town clerk and, in the instance of Marathon, by municipal staff employed in the town's information office.<sup>1</sup>

The totals quoted by these town officials were then revised downward because it was felt that they were too site specific to be representative of an average of land cost generally, in small

---

<sup>1</sup>Marathon, Ontario is located immediately adjacent to a major gold discovery at nearby Hemlo and is expected to house the majority of workers who will move to the area with their families and take up employment in one of the three new mines being developed there.

northern towns.<sup>1</sup>

The calculation of costs associated with construction of a new house in 1983 were, then calculated, as follows:

---

<sup>1</sup>The Town of Nipigon, Ontario is currently (1984) in the process of developing a 114 lot residential subdivision from which approximately 20 lots will be made available to residents each year. Information provided by the town clerk noted that this particular subdivision, for which the raw land cost was \$95,000., would carry full urban servicing standards, including sewer, water, street lighting, concrete curbs and gutters, asphalt paving, and storm sewers. His estimate of the final selling price for these lots was \$15,000.

At the same time, the Town of Marathon, Ontario, which is located in the midst of the most intensive gold mine development in North America, and is, therefore, anticipating almost a doubling of its population, is also developing a residential subdivision to similar standards. Their estimate of an average sale price for a residential lot is \$13,700. (spring, 1985).

Information provided by the City of Thunder Bay Engineering Department anticipated that servicing costs could be reduced by approximately \$60. to \$65. per foot of frontage were concrete curb and gutter eliminated and the pavement width reduced from 36 feet to 24 feet.

Insofar as the lot price used for calculation purposes was concerned, assuming the 1983 land price to be 5 percent less than the anticipated 1984 selling price, and using an average of the Nipigon and Marathon figures as a base from which to work, a realistic sale price for a "fully" serviced lot in 1983 would have been \$13,632. Applying the cost reduction that could be expected for a 66 foot lot due to the elimination of curb and gutter and reduction of pavement width only, resulted in a net land price of \$9,972. A total of \$10,000. has been used therefore, for calculation purposes, with the expectation that this would still be a conservative estimate of an average cost for small towns typical of the region.

Construction Cost (as per Table 3.1)	\$50,524.00
Land Cost	<u>10,000.00</u>
Total Dwelling Cost	\$60,524.00
Less Downpayment	<u>9,078.00</u>
Balance to be Financed by Mortgage	\$51,446.00
Average Mortgage Rate for 1983:	11½% <sup>1</sup>
Mortgage Term: 20 years:	

Based upon the foregoing, the mortgage debt-to-gross income ratio for 1983 was calculated as follows:

Annual Mortgage Payments:

$$\$534.90 \times 12 = \$6,418.80$$

Annual Gross Income:

$$\$13.78/h \times 40/h \text{ week} \times 52 \text{ weeks/year} = \$28,662.40$$

1983 Mortgage Debt-To-Gross

$$\text{Income Ratio:} = 0.2239$$

---

<sup>1</sup>This was the rate set for the author's mortgage for 1983.

### 2.3 Mortgage Debt-To-Income Ratios Based Upon Net Income: 1963, 1973, 1983:

---

As noted previously, the mean family size for the Town of Nipigon, Ontario, as shown in 1981 census data, was 3.54 persons. Based upon this information, Table 2.6 lists after-tax net income calculations for each of the study years for a family of four, consisting of one working adult, one adult in the home and two children under the age of sixteen years.

The net income figures have been used together with the construction cost and mortgage data presented in Section 2.2 in precisely the same calculations to derive mortgage payment-to-net income ratios for each of the study years. These figures have been listed with the corresponding ratios based upon gross-incomes in Table 2.7.

TABLE 2.6

Calculation Of Net Income For A Typical 1981 Census Family  
(2 Adults, 2 Children - 1963, 1973, 1983)

	<u>1963</u>	<u>1973</u>	<u>1983</u>
Gross Income:	\$4,992.	\$9,991.	\$28,662.
Deductions:			
Employment Expenses	N/A	150.	500.
Canada Pension Plan	N/A	90.	300.
Unemployment Insurance	N/A	83.	460.
Union Dues	54.	96.	180.
Personal Exemption	1,000.	1,600.	3,770.
Married Exemption	1,000.	1,400.	3,300.
Child Exemption	600.	600.	1,420.
Standard Medical Deduction	100.	100.	100.
Net Taxable Income:	2,238.	6,032.	18,632.
Federal Tax	308.	1,111.	3,214.
Provincial Tax	49.	369.	1,676.
After-Tax Income Calculation:			
Deductions From Gross Income:			
Canada Pension Plan Premiums	N/A	90.	300.
Unemployment Insurance Premiums	49.	83.	460.
Union Dues	48.	120.	180.
Income Tax	357.	1,480.	4,890.
Net Income:	\$4,438.	\$8,218.	\$22,832.



TABLE 2.7Annual Mortgage Payment, Gross and Net Annual Incomes and  
Mortgage Payment-To-Income Ratios - 1963, 1973, 1983

	<u>1963</u>	<u>1973</u>	<u>1983</u>
Total Dwelling Cost	\$15,215.	\$24,956.	\$60,524.
Mortgage Interest Rate	6 1/2%	9 3/8%	11 1/2%
Downpayments	2,016.	3,783.	9,078.
Annual Mortgage Payment	1,061.	2,330.	6,419.
Gross Annual Income	4,992.	9,991.	28,662.
Net Annual Income	4,438.	8,218.	22,832.
Mortgage Payment-To-Gross			
Annual Income Ratios	0.213	0.233	0.224
Mortgage Payment-To-Net			
Annual Income Ratios	0.239	0.284	0.281

### 2.3 Resident Survey - Town of Nipigon, Ontario:

#### 2.4.1 The Size of the Sample:

A total of ninety questionnaires was randomly distributed as described in Section 1.4.3. Based upon census figures for 1981, the Town of Nipigon had 2,681 residents living in a total of 840 private dwellings. Thus, a 100 percent response rate would have accounted for a sample of 10.7 percent of all residences in the town. In fact, of the ninety that were distributed, a total of 26 completed questionnaires were returned. These represented only 3.1 percent of all private dwellings in the town.

#### 2.4.2 Basic Characteristics of the Sample:

The questionnaires that were returned were first examined with respect to family make-up, age, tenure, and income. The results have been summarised on Table 2.8, which follows:

TABLE 2.8

	<u>MEAN</u>	<u>STANDARD DEVIATION</u>	<u>STANDARD ERROR OF THE MEAN</u>
<u>AGE:</u>			
Owners	35.92 years	6.30 years	1.20 years
Tenants	25.91 years	4.34 years	0.90 years
<u>INCOME:</u>			
Owners	\$32,333.	\$10,907.	\$3,147.
Tenants	\$28,583.	\$13,813.	\$3,987.
<u>RENT/MORTGAGE-TO-INCOME RATIOS:</u>			
Owners	12.1%	6.4%	2.26%
Tenants	14.2%	7.6%	2.19%
<u>LENGTH OF RESIDENCE:</u>			
Owners	15.01 years	10.02 years	1.96 years
Tenants	11.43 years	9.44 years	1.92 years
All Residents	13.49 years	9.78 years	1.38 years

#### 2.4.2.1 Family Make-Up:

Insofar as family make-up was concerned, it came as little surprise, in light of census data, to find that of the 26 responses received, 25 (i.e. 96 percent) were from husband-wife families. Census data show that these account for 630 (or 90.6 percent) of the 695 families in private households in Nipigon, so, in this regard, the sample appeared fairly representative of the general family make-up of the town.

#### 2.4.2.2 The Ages of Respondents:

The mean age of all respondents represented by the sample (i.e. a total of 51 persons) was 31.24 years. The sample range was 28 years with lower limit of 21 years and an upper limit of 49 years.

The standard error was calculated to be 7.41 years and the standard error of the mean was 1.04 years.

Corresponding values for the entire town, based, again, upon 1981 census data, showed a mean age of 32.22 years and a standard error of 21.71 years.

Since the survey was aimed at "adult" residents in general, and, more particularly, at owners who would have purchased their homes since 1963, or would-be owners who could be expected to do so in the future, a more representative group for age purposes would be one which excluded those over 55 years of age and those under 20 years of age. This group, which comprised 43.78 percent of the town's population had a mean age of 33.36 years, a standard error of 9.59 years and a standard error of the mean of 0.28 years. A comparison of the sample means and standard errors showed that in terms of age, the survey sample was reflective of the age range of those who comprised the "target" group described above.

#### 2.4.2.3 Tenure:

Census data showed that of 840 occupied private dwellings in Nipigon, 635 (or 75.6 percent) were owner-occupied. The percentages of owners and tenants in the survey sample, however, showed an even division between these two groups. This was not deemed to be unusual since it anticipated that responses would favour tenants who would likely have somewhat more concern about the affordability of housing than would those who had already become owners. Furthermore, the fact that the breakdown between owners and tenants was equal, provided a more solid basis upon which to make comparisons between the two than would one that followed more closely the proportion of rented-to-owned dwellings.

#### 2.4.2.4 Income:

Amongst the 26 responses received, there were two which did not respond to the questions regarding income. The mean family income for the remaining 24 replies was \$30,458; the standard deviation was \$12,332. and the standard error of the mean was \$2,522. By comparison, census data listed a mean family income of \$28,671., with a standard error of \$1,111. The census data recorded income information for 1981, however, while the survey was conducted in 1983. A conservative estimate of an average 3 percent annual wage increase for 1972 and 1982 applied to the census mean wage of \$28,671. would result in an average family income of \$30,417. for 1983 which is virtually the same as the average of survey responses.

## 2.5 Some Comparisons Between Owners and Tenants:

Preliminary examination of the survey questionnaires revealed a number of apparent differences between tenant responses and those of homeowners. As noted earlier, some of these have been summarised in Table 2.8.

Insofar as age is concerned, the tenants were substantially younger than homeowners. A typical tenant household had a mean age of 25.91 with a standard deviation of 4.34 years. By comparison, the mean age for owner households was 35.92 years and the standard deviation was 6.30 years. Respective standard errors of the mean were 1.2 years and 0.9 years. Analysis by means of a t-distribution showed this difference in ages to be significant at the .05 level.

With regard to family make-up, with one exception which listed no children, all respondents (or 92 percent of this group) reported two adults supporting children. Tenants, on the other hand, were mixed in family make-up. While 12 of the 13 tenant households reporting consisted of husband-wife families, only 7 (or 58 percent) were supporting children.

There was a difference between the means of the annual incomes of tenants and owners of \$3,750. The average annual income of owners was \$32,333. while, for tenant families, the total was \$28,583.00. Standard deviations for each of these were \$10,907. and \$13,813. respectively, and the corresponding errors of the mean were \$3,149., and \$3,987. The difference between means was found to be not significant at the .05 level however.

With regard to rent-to-income and mortgage-to-income ratios, owners appeared to have fared somewhat better than the tenant population. Although taken collectively, all but one of the respondents were well within the generally accepted figure for maximum acceptable gross rent-to-income ratio of 30 percent.

The mean net mortgage payment-to-income ratio was found to be 8.1 percent when all owners were considered. Included in the sample, however, were four respondents (33 percent of owners and 20 percent of the entire sample) who reported no monthly mortgage payments. The mean ratio for those respondents who did, in fact, have a mortgage payment was 12.1 percent; the corresponding standard deviation was 6.4 percent; the standard error of the mean was 2.26 percent. Tenants, on the other hand, experienced a mean net rent-to-income ratio of 14.2, with a standard deviation of 7.6 percent and a standard error of the mean of 2.19 percent. Actual figures as to the amounts of rent and mortgage payments were as follows:

TABLE 2.9Monthly Rent and Mortgage Payments: Nipigon, Ontario

	<u>Mean Monthly Payment</u>	<u>Standard Deviation</u>	<u>Standard Error</u>	<u>Mean Monthly Income</u>
All Owners	\$250.	\$220.	\$66.	\$2,694.
Owners Making Mortgage Payments	\$347.	\$178.	\$63.	\$3,062.
Tenants	\$300.	\$169.	\$47.	\$2,694.



Again, application of a non-directional t-test showed the difference between mean rent/mortgage-to-income ratios developed for the groups listed above was not significant at the .05 level.

#### 2.6 Nipigon, Ontario: A Desirable Place to Live?

Based upon the overall responses to particular questions included in the survey, it would appear that the great majority of residents are not only satisfied with the life-style afforded them by the community, but that they would recommend their town as a desirable place for others to settle as well.

Of the tenant respondents, 69 percent (9 of 13 respondents) indicated that they would consider building a new home in Nipigon. At the same time, only 40 percent of those who replied in the negative were actually saving towards the purchase or construction of a new home elsewhere. In the case of those who already owned their homes, 85 percent stated they would recommend their town as an appropriate location to someone considering building a new home.

Another indication of the extent of resident confidence in the town, as well as of the overall level of satisfaction with the general life-style attached to the town, is the length of time that families have lived there. Analysis of the survey data revealed that:

- (a) 46 percent of the replies included at least, one family head as having lived in Nipigon all of his/her life.
- (b) the mean length of residence in Nipigon was 13.49 years, standard deviation was 9.78 years. The standard error of the

mean was 1.38 years. A comparison of owners and tenants revealed that the mean length of residence for owners was 15.01 years. The standard deviation of 10.02 years and the standard error of the mean was 1.96 years. The period of residence for tenants was lower at 11.43 years. This was not thought to be unusual given the differences in mean ages for the two groups. Standard deviation here was 9.44 years and the standard error of the mean was 1.92 years.

While t-test analysis showed no significant difference at the .05 level, between the mean periods of residence for owners and tenants, or between means for owners or tenants and the mean for all respondents, the various mean lengths of stay in Nipigon were interesting when compared to the corresponding mean ages for each of the above-named groups. A summary of these follows as Table 2.10:

TABLE 2.10

Mean Ages and Periods of Residence for Survey Respondents  
Nipigon, Ontario

---

	<u>Mean Age</u>	<u>Mean Period Of Residence</u>
All Respondents	31.24	13.49 years
Owners Only	35.92	15.09 years
Tenants Only	25.91	11.43 years

The figures listed in Table 2.10 indicate that for the overall sample as well as for each of the two sub-groups, the mean length of stay in Nipigon has comprised, virtually, all of the "adult" life of the respondents. The survey data which indicated a relatively low level of transience was consistent with 1981 census data which, based upon a 20 percent sample, showed 69.9 percent of residents to be "non-movers".

### 2.7 Perceptions of Costs and Affordability:

Although a gross debt-to-income ratio (i.e. using gross income as the denominator) of 0.30 has gained broad acceptance as an upper limit for housing related costs that can be deemed affordable, it was an aim of the research to obtain some indication of the level at which residents generally felt their upper limit to be. In order to do this, the survey asked that they list the amount which they felt they could pay and not have it affect their current life-style.

The mean perceived maximum (i.e. affordable) mortgage payment was calculated to be \$410.00. The standard deviation was \$152.00 and the standard error of the mean was a salary of \$30,458.00, this \$410.00 monthly payment gave a mean perceived maximum (i.e. affordable) net mortgage payment-to-income ratio of 16.15 percent. When the ratio was calculated on an individual survey response basis and averaged, the resulting perceived mean net mortgage-to-gross income ratio was found to be 17.29 percent. The standard deviation was 6.19 percent and the standard error of the mean was calculated to be 1.29 percent.

The above figure was an increase of 28.13 percent over the mean net mortgage or rent-to-gross income ratio of 13.40 percent actually experienced by respondents. Even this increase, however, fell substantially short of the 30 percent total as shown by the

following calculations.

In order to obtain an approximation of a mean gross rent-to-income ratio, the following costs were added to the perceived \$4,920.00 affordable annual mortgage outlay:

Municipal Taxes	\$ 600.00
Heat (Natural Gas)	900.00
Water	90.00
Electricity	360.00
Telephone	<u>100.00</u>
Total	\$2,050.00

The total perceived affordable annual payments to housing, then, were as follows:

Annual Mortgage/Rent Payment	\$4,920.00
Operating and Maintenance Costs	<u>2,050.00</u>
Total Annual Payment	\$6,970.00

Based upon a mean annual reported family income of \$30,458., this total of \$6,970., resulted in a calculated gross rent-to-gross income ratio of 22.88 percent. Application of the maximum gross rent-to-gross income ratio of 30 percent to the mean annual wage of \$30,458. resulted in a maximum total of \$9,137. available for housing-related expenditures. Deducting the total of \$2,050. for taxes and utilities, leaves a total of \$7,087. available, directly, for mortgage payments.

At an interest rate of  $11\frac{1}{2}$  percent annually, the monthly payment of \$590.00 would allow for financing of \$56,300.000 over a 20-year term.

By comparison, the perception of the respondents was that the maximum annual mortgage expenditure that they could afford was \$4,920.00 (i.e. \$410.00 per month) which would allow for financing of only \$39,000.00 on the same basis as outlined above. Considering the calculated cost of \$60,524.00 for the house analysed, a monthly mortgage payment of approximately 35 percent of the purchase price would be required. This is more than double the average downpayment made and, as well, it would appear to be beyond the financial capacity of the average buyer.

The differences between the perceived ability to pay, the anticipated purchase price and some of the financial facts-of-life were more apparent when examined in the context of the calculated mean anticipated purchase price for a new home of \$61,250.00. The required 36 percent downpayment (\$22,250.00) would appear to be a generally prohibitive fact to which respondents, on average, gave little thought.

Of some interest, in this regard, was the fact that only half of those respondents who were saving towards the purchase of a new home, had availed themselves of the tax advantages offered by the federal government Registered Home Ownership Savings Plan.

## 2.8 Self-Built Housing and the Opportunities for Savings:

### 2.8.1 The Desire for Self-Built Housing:

Sixty-five percent of all respondents stated a preference for self-built houses as opposed to 31 percent who replied that they would opt for a newly-built home. The remaining 4 percent

suggested that they would look to an older home as a first choice.

Of those who preferred the self-built option, 71 percent felt that they had the ability to act as their own general contractor or construction manager. By way of contrast, only 25 percent of those who opted for the purchase of a newly-built home, felt they could manage the construction themselves. On an overall basis, 58 percent of the respondents felt they would be able to act as their own general contractor.

The sample size was too small to allow a valid chi-square test to be performed. However, the fact that 75 percent of those who did state a preference for a newly-built home also replied that they did not have sufficient knowledge to allow them to act as their own general contractor, may have been significant in a general sense. If these respondents, who made up 23 percent of the total sample, preferred the ready-built home, only or primarily, because of their self-confessed inability to manage its construction it may very well be that if they were to have access to experienced persons who could assist them in that area, they would have selected a self-built home as their first choice.<sup>1</sup> In the event that this assumption applied only to half of this group, it would still result in a total of 77 percent desiring to be involved in the actual construction.

---

<sup>1</sup>Information supplied by the building inspection services department of the City of Thunder Bay, Ontario, where there is no shortage of reliable and experienced building contractors, showed that for the first five months in 1984, approximately 73 percent of all residential permit applications were made by owners acting as their own general contractors.

TABLE 2.11

Distribution Of A Percentage Basis Of The Means By Which Owners  
Would Expect To Complete Selected House Construction Activities

	HIRE A TRADESMAN OR CONTRACTOR	DO IT YOURSELF	HIRE AND PAY CASH	DO IT YOURSELF OR WITH HELP WHICH WOULD NOT BE PAID	TOTAL: COLUMNS 2 AND 4
PREPARE DRAWINGS	27	36	23	14	50
PREPARE MATERIAL LISTS:					
ELECTRICAL SUPPLIES	40	24	16	20	44
FRAMING MATERIALS	35	19	12	34	53
PLUMBING SUPPLIES	27	23	23	27	50
HEATING SUPPLIES	46	12	24	18	30
EXCAVATE	56	0	22	22	22
BUILD A Poured BASEMENT	43	5	14	38	43
BUILD A MASONRY BASEMENT	39	13	13	35	48
ROUGH FRAMING CARPENTRY	29	18	11	42	60
SHINGLES	16	40	8	36	76
FINISHING CARPENTRY	19	35	15	31	66
INSULATION	19	35	8	36	76
INSTALL DRYWALL	25	10	5	60	70
TAPE AND FILL WALLBOARD	28	28	4	40	68
INSTALL CUPBOARDS	15	31	15	39	70
PLUMBING WORK	28	16	28	28	44
ELECTRICAL WORK	28	32	20	20	52
HEATING WORK	31	23	15	31	54
FLOORING	15	38	4	43	81
WOOD SIDING	22	26	4	48	74
BRICK VENEER	52	9	13	26	35
STUCCO	43	10	14	33	43
PAINTING	0	59	5	36	95
CERAMIC TILE	5	48	10	37	85



### 2.8.2 Opportunities For Construction Cost Reductions:

Since, as was apparent from the survey data, the majority of those entering the ownership market would prefer to participate in the construction process, it was desired, through the medium of the survey, to obtain some indication of the extent to which they felt they could become involved. It was intended, then, to apply this information to the cost data developed earlier to establish the extent of the savings that one might expect to effect through participating, personally, in the construction of his or her new home.

Table 2.11 lists, for various elements in the housebuilding process, a breakdown, on a percentage basis, of how owners would expect to complete, or have completed, those items. Of particular interest, in this regard, were the sums of the individual totals that make up columns 2 and 4, since work done under these circumstances would entail no cost to the owner. The mean for the row totals for the sums of columns 2 and 4, taken above all of the listed activities, was 57.66 percent and the standard error of the mean was 3.71 percent.

Since a lower limit of 60 percent would fall within one standard error of the mean of the sums for columns 2 and 4, those activities where the percentage of owners expecting to complete the work themselves (i.e. column 2), plus the percentage expecting to complete it with help which they would not have to pay (i.e. column 4), was 60 percent or better, were identified as areas where savings could be available with an above-average frequency.

On this basis, the following items were extracted from Table 2.11 and listed together with the corresponding labour costs shown in the cost estimate for 1983 which appears in Appendix I:

Rough Framing	(60%)	\$ 3,558.92
Shingles	(76%)	469.30
Interior Finishing Carpentry	(66%)	997.27
Insulation	(73%)	297.83
Drywall Installation	(70%)	433.20
Tape and Fill Drywall	(68%)	487.35
Install Cupboards	(70%)	144.40
Finish Flooring	(80%)	256.60
Exterior Siding	(74%)	1,191.30
Painting	(95%)	2,065.50
Ceramic Tile	(85%)	<u>129.84</u>
Possible Net Saving		\$10,031.51
Plus Overhead Saved At 18%		<u>1,805.58</u>
Total Possible Average Gross Saving		\$11,837.09

As well, the estimate included an amount of \$1,974.76 for general supervision and activities related to the supply and delivery of materials. Where an owner undertook this work on his/her own, this total, as well, would no longer be an out-of-pocket expense but, instead, would be transformed into an additional saving of \$2,330.00.

Based upon the foregoing, then, the general extent of savings that one might expect to achieve through participation in the actual construction activities would be \$14,167.00. This would result in a gross cost to the owner of \$46,357.00 (i.e. \$60,524. minus \$14,167.).

It has been rare, however, at least in the author's experience, to encounter a situation where all of the rough framing is completed

at no cost. Most often, in cases where the owner is the contractor, this work is done by paid labour. Generally, payment is on a cash basis and usually the rate of pay is approximately 30 percent less than the union rate or is determined on a square-foot basis.<sup>1</sup> This would reduce the saving to the owner from \$3,338.92 to \$1,067.40 for the rough framing. The revised cost to the owner would then become \$48,848.43.

Assuming that the same average downpayment ratio used in earlier calculations (i.e. 15 percent) was applied to this reduced figure, the monthly mortgage payment would be determined as follows:

Total	\$48,848.00
Less Downpayment	<u>7,327.00</u>
Balance To Be Financed Through A Mortgage	\$41,520.00

With interest being calculated at 11½ percent over a twenty-year term, the monthly payment would be \$434.98.

Based upon the calculated mean and annual wage figure of \$28,662.00, as determined in Section 2.2.2 the net mortgage-to-gross income ratio would be 17.79 percent. Adding the annual operating cost of \$2,050.00 to the total would generate a gross debt-to-gross income ratio of 25.36 percent and a gross debt-to-net income ratio

---

<sup>1</sup>The author has based this information upon his experience over a ten-year period as a self-employed design consultant, project manager, and general contractor during which time he has worked with numerous owners who wished to act as their own general contractors.

of 0.318 percent. If the mean annual family income of \$30,456.00, as determined from the survey data was used, those figures would be reduced to a 17.1 percent net mortgage-to-gross income ratio and a gross debt-to-gross income ratio of 23.87 percent.

#### 2.9 Acceptability of the Design of the Study House:

While determining that the house presented for study was no less affordable in 1983 than it was in 1963 was important in itself, the research required, as well, that some indication of its current acceptability be obtained. This was done through the survey where 73 percent of respondents replied that they would consider this 26 year old design acceptable as presented in the Central Mortgage and Housing Corporation publication in 1957, were they building a new home in 1983.

The 27 percent who did not find the plan acceptable were, by and large, younger (mean age of 26 years) than the mean age of the sample. As well, their objections were varied and, generally, minor in nature. They ranged from "the house is too square", there is not enough "wall space" to "the style would not fit a northern landscape". The only comments that appeared to exhibit any degree of concurrence referred to the kitchen and bathroom as being too small and these were noted on only 3 responses.

The frequency distributions which are shown on Table 2.12 serve to reinforce the 73 percent acceptance figure for this very basic and simple design. Only three items listed in the Table, namely: a second bedroom, a third bedroom and a clothes dryer, were considered necessities by more than half of the respondents. Of particular interest were those items considered "not necessary" by a majority of respondents.

TABLE 2.12

Frequency Distribution By Percentage Of Respondent Perceptions Of  
The Need For & Desirability Of Various House-Related Amenities

	A NECESSITY	PREFERABLE AND AFFORDABLE	NOT NECESSARY	PREFERABLE BUT UNAFFORDABLE
THIRD BEDROOM	54%	27%	0%	19%
GARAGE	23%	27%	18%	32%
SECOND BEDROOM	83%	8%	0%	9%
RECREATION ROOM	8%	31%	31%	30%
DINING ROOM	8%	28%	48%	16%
BRICK VENEER SIDING	4%	21%	63%	12%
PATIO DOORS	4%	26%	58%	12%
TRIPLE GLAZING	32%	14%	36%	18%
FIREPLACE	0%	26%	50%	24%
AIR CONDITIONING	0%	4%	62%	34%
DOUBLE GARAGE	4%	8%	72%	16%
DISHWASHER	23%	19%	46%	12%
MICROWAVE OVEN	0%	20%	68%	12%
CONVECTION OVEN	26%	13%	53%	8%
CLOTHES DRYER	71%	12%	4%	13%
SECOND AUTO	20%	24%	28%	28%
THIRD AUTO	0%	0%	95%	5%
CABLE TELEVISION	39%	39%	17%	5%
SATELLITE DISH	8%	8%	72%	12%

While many of these are regularly used to enhance the saleability of a new home, it is obvious, from the survey data, that the majority of the population, at least in towns such as Nipigon, is quite prepared to live without items which can add significantly to the cost of a house such as brick veneer, a fireplace, or a separate dining-room.

CHAPTER 3: CONCLUSIONS, COMMENTS,  
AND RECOMMENDATIONS

3.1 Overall Conclusions:

The research process involved in this work was subject to a number of limitations including restrictions upon the time-frame and upon the financial resources, a small survey sample, and the use of estimated figures for relatively important items such as land costs and downpayment totals. With those restrictions in mind, and based upon the results of the research programme, the following conclusions can be drawn:

- (a) Using the changes in annual income and the corresponding changes in construction costs as a basis for comparison, the ratio of the total construction cost for a typical one-storey detached house in northern Ontario to the average annual income was 28 percent less in 1983 than it was in 1963.
- (b) Using a net mortgage payment-to-gross income ratio (i.e. not including operating costs) as a basis for comparison, the cost of owning that single-storey detached house had not changed measurably from its 1963 level.
- (c) The measure of the change in the ratio of net payment-to-net income (unadjusted)<sup>1</sup> indicated

---

<sup>1</sup>Collective Agreement between Abitibi-Price Inc. (Thunder Bay Division) and Canadian Paperworkers Union, C.L.C. Local No. 134, May 1, 1982 to April 30, 1984.

It should be noted that net incomes for 1963 and 1983, for example, are not directly comparable. A significant influence that would tend to distort any direct comparison is the benefit package that now (1983) accompanies the papermill workers' union agreement. Vacations in 1983 were, at a minimum, one week longer, on a comparative basis, than they were in 1963. Also, in 1983, medicare premiums (a total annual benefit of \$720.00 for the family

that the cost of the house had not changed over the period from 1973 to 1983, but that the ownership cost had increased by approximately 4% of net income between 1963 and 1973.

- (d) Using a gross debt-to-income ratio of 0.30 as the basis for defining the point beyond which housing costs may be deemed unaffordable, in the towns typical of northwestern Ontario, the single-family detached house is not beyond the financial capabilities of the "average" worker. Based upon calculated annual income levels and construction costs, and a minimum downpayment, owners could conservatively expect to experience a maximum gross debt-to-income ratio of 0.30 percent.
- (e) Based upon the results of a survey in the Town of Nipigon, Ontario, it would appear that prospective owners could expect to encounter significant opportunities, first, for direct involvement in the construction of a new home; second, for obtaining labour input from others in the town at no direct cost to themselves; third, for reducing out-of-pocket expenses through access to the payment-in-cash economy. The extent of the reductions in cost,

---

described) were fully paid by the employer as well as extended health care premiums (\$240.00 per year for a family) extend free dental care of up to \$1,000. per family member per year. The 1983 agreement benefit package also included a life insurance policy providing \$60,000. coverage at no cost to the employee together with a long-term disability plan, again, at the employer's expense. None of these were included in the 1963 union agreement.



one would appear, realistically, to anticipate through any combination of these three options, would be in the order of 23 percent. Such a reduction in construction cost would result in an average reduction in the gross debt-to-income ratio of approximately 15 percent. This would result in the 0.30 figure listed in 3.1 (d) being cut to 0.255 percent.

### 3.2 Comments On The Study Results:

Although data drawn from 1981 census publications, and from the survey conducted as part of the research programme, indicated that the use of a higher mean wage (something in the order of \$30,400.) for the calculation of debt-to-income ratios would not be inappropriate, in anticipation of possible criticism suggesting that the figure used as a mean family income was too liberal, the lower "calculated" mean wage figure of \$28,662. (not including benefits) was used for calculation purposes. Thus, any bias in the mean debt-to-income ratios, quoted previously in this work, would tend to cause them to be somewhat more conservative than those one would actually expect to find through more thorough direct research.

If, in fact, the \$30,456. mean annual income, as determined from the survey data, had been used in place of the lower calculated figure of \$28,662. the mean gross debt-to-gross income ratio would have been reduced by 7.4 percent to 0.275, while the ratio of net annual mortgage payment-to-gross annual income would decrease by 8.24 percent to 0.198. The determination of ratios based upon wages reported in the survey that were lower than those obtained through the use of the calculated values also lend some support to the proposition that the house for which the ratios were calculated was, in fact, "affordable" to the average family in the town.

Of further significance is the fact that these debt-to-income figures are based, in part, upon construction costs that

would be encountered by a developer or builder. That is that all labour costs were calculated on the basis of unionised labour completing the work.

Survey results, however, indicated a pronounced desire on the part of respondents to undertake the construction of their own homes, either wholly or in part. While such an option may not, generally, be available to persons resident in very large metropolitan centres where major developers may control much of the available land, it would appear, again, based upon the survey results, that within the Town of Nipigon, Ontario, there is something more than a passing opportunity to do so.

As noted in Chapter 2, through a combination of direct labour input and the ability to call upon others who would not expect to be paid for their assistance, an owner in Nipigon could, realistically, expect to see the calculated construction cost of \$60,524. reduced by approximately 21 percent. This saving would reduce the gross debt-to-gross income ratios to 0.252, based upon the calculated income, and to 0.237, using the survey totals. The respective net mortgage payment-to-gross income ratios of 0.171 and 0.161 both approximate the 0.162 ratio that residents indicated would mark the upper limit of what they would deem affordable. Even though these reduced figures are still approximately 24 percent higher than the mean of those reported in the survey, it would appear that not only does the opportunity, for the most part, exist for one to construct and finance his/her house at costs approximately 15 percent below the level generally accepted by government as maximum, but that the work can be financed at costs which are within levels that the residents, themselves, feel would not cause them to alter or reduce their current standards of living.

The self-built home, or owner/contractor situation, may very well be less of an option and more of a necessity in towns such as Nipigon owing to the lack of resident house-building contractors and land developers. As such, the municipality, generally, is

called upon to act as developer and, further, to ensure that lots which it has developed are equitably distributed amongst town residents. The benefit that this situation brings to purchasers lies in the fact that the municipality, generally, develops lots out of some political imperative and, consequently, sells the lots for prices that reflect little more than bare development costs. Such situations can, therefore, allow those with marginal incomes into the home ownership market. This would not likely be possible in a larger centre.

In summary, there is an evident desire on the part of owners and prospective owners to have some involvement in the construction of any new home that they might wish to own. As well, residents appear to be able to elicit unpaid assistance, complete many items themselves or to call upon persons to whom they could pay a reduced amount in cash. Such abilities will allow gross debt-to-income ratios, well within acceptable limits to be effected and even if all labour were to be paid at a full trade union rate, the cost would still fall within those limits.

### 3.3 Recommended Policy Directions:

The general finding of the research, that is, that in these small resource-based towns of the mid-north, the single-family house is a generally affordable commodity to the average resident employed in the resource industries, leads to policy recommendations at three general levels:

First, on a national level, it is evident that much more, and much more detailed research oriented towards discovering what constitutes viable housing solutions in these small towns is necessary in order to either confirm or disprove the findings of this work. As well, it would appear in the light of this research, that there is an opportunity for the Canada Mortgage Corporation to once again include the now nonexistent "housing" component to its organization, by assuming an active role as the prime government agency initiating and providing the support for

programmes aimed at promoting municipality-funded land development projects as well as owner involvement in the construction of new housing. Finally it is essential that those senior levels of government charged with responsibilities for housing policy recognize the fact that initiatives aimed at enhancing affordability of housing cannot continue to be based upon the precept of Canada as monolith. If they are to be realistic responses to the many and varied housing situations they are intended to address, they must instead give serious consideration to the apparent differences between those conditions that typify major metropolitan centres and others in this case represented by the small resource towns. The second area requiring attention by means of very specific and targeted housing policies is that which falls within the purvey of municipal government. Upon even a cursory examination of the cost calculations undertaken in the research it is readily apparent that affordability relies very heavily upon the selling price of land. If the small towns of the mid-north are at all serious about developing economies that are more broadly-based, they will by necessity be required to maintain suitable inventories of "developed" and/or readily-developable land which are, or could be made available to individual homeowners, housing co-operatives, builders' co-ops and the like, at "affordable" prices. This will mean for councils, long-term examinations of overall land-use directions, servicing standards, and of their criteria for establishing sale prices for residential properties.

In any case, viewed from the perspective of the municipality as prime developer of residential land, if housing is to be made affordable on as universal a basis as possible, and if affordable housing is to be the linchpin for the community's economic well-being and development, the view of land sales as a profit-making exercise must very simply be dismissed out-of-hand. Municipal officials must understand as well however, that in dispensing land, the municipality will by necessity be required to take steps to

ensure that lots are made available only to those who are prepared to make a legal commitment to both build and live on them. If land is made available to town residents at minimal cost, it will in turn result in costs to owners that are significantly lower than those typical of major metropolitan areas and will allow many persons into the ownership market who, in those larger centres, would be relegated to significant, if not lifelong, terms as tenants.

In the case of those towns located in the Province of Ontario who are either currently blessed with Official Plans or about to be so endowed, these recommendations should be outlined specifically as significant parts of the goals enunciated in those Official Plans.

The third area wanting attention is that which involves the homeowner directly. Here the intent of policies must be to stimulate and encourage investments in single-family housing by individuals. Action need not, in the light of this research, take the form of direct financial incentives or grants. Assistance could instead be provided through promotion of, and financial aid to, educational or self-help programmes and other less-than-commonplace sweat-equity schemes such as builder co-ops.

As the research has shown, a significant proportion (perhaps even the great majority) of residents of the small mid-northern communities would prefer, or might very well be required, to undertake the construction of their homes themselves. This largest single investment that they would ever be likely to undertake, would, under present circumstances have to be made with little more than a cursory knowledge of the construction process involved, of its components, or of the many possible pitfalls that accompany it.

As a means of addressing this situation, it is recommended that an educational seminar-type programme be developed with the object of explaining the housebuilding process to prospective owner-

builders in layman's terms. Briefly this programme should include the following as core elements for discussion:<sup>1</sup>

- I Considerations in Selecting a Design.
- II Building Codes and Inspection Procedures.
- III The Elements of House Construction: (Materials, construction methods, costs, and workmanship).
  - Foundations
  - Rough Carpentry
  - Insulation
  - Interior Finishes (doors, hardware, cabinets)
  - Paints and Stains
  - Electrical Systems
  - Heating and Ventilating
  - Plumbing
- IV The Housebuilding Process.
- V How to Prepare an Estimate/Budget.
- VI How to Control Costs.
- VII Inspection and Quality Control.
- VIII Legal and Insurance Considerations.

Because of the organisation's experience and its responsibilities which at one time or another have virtually affected all facets of housing-related activity, responsibility for development of the content of such a programme could well be assumed by the Canada Mortgage Corporation. Administration of the programme, on the other hand, would best be undertaken by persons possessing experience in the field of adult education along with a sound knowledge of the housing industry. In the Province of Ontario, in any case, this function would appear to be ideally suited to the operations of the provincial community colleges. These institutions have, for some

---

<sup>1</sup>Kenneth Lelen: "Build your own hose - they'll teach you how at owner-builder schools", Popular Science, May, 1983, pp 113-116. This article outlines some of the details of programmes apparently similar to the one described here, that are offered at private

time, in the north undertaken various extension courses in outlying communities, have substantial experience in the field of adult education and, through their technical programmes, have full and part-time staff with the expertise, both in the building trades and in the associated financial fields, to properly undertake the "teaching" of such a programme.

The results of participation by owners in such a programme should enable them to, at a minimum, successfully manage the construction process and obtain full value for money spent. As well, it may make it possible for them to undertake portions of the actual work themselves. In a more general sense, it would certainly assist in the upgrading of the overall quality of housing stock in those small communities.

In the case of the municipality which, as the primary land developer, is the second body to which aid should be made available, assistance should be of a more general type. Rather than developing a specific programme or course, as was recommended for prospective owners, the type of assistance required here should be broad in scope, much less structured, less specific, and more holistic in its content.

The fact that the towns are small and populations relatively stable, dictates that major land development schemes are not normally everyday occurrences. Decisions taken by municipal councils can, therefore, have long-term ramifications for many aspects of life in their towns. It is not an unlikely scenario, therefore, to suggest that, for many a municipal councillor, whether serving many terms or only one term, his or her involvement in a "major" residential land-development scheme would likely be a one-time event.

---

owner-builder "schools" in the United States. The article provides a listing of schools with this type of programme. As these are private schools, in the American tradition of no free lunch, they all charge fees which, according to the list provided in the article, range from approximately \$200. to \$650.

As such, as a benchmark, these councillors should, prior to undertaking any physical residential development decisions, have as much background information as possible that would allow them to make informed decisions which would address the needs of the town's residents, any ramifications, financial or otherwise, for the town, and would reflect the latest and best of work being done elsewhere.

The provision of this type of information could be made available to municipal bodies through existing facilities and organisations which have at their disposal, or, at least, have access to, resource personnel possessing expert knowledge in the various areas of planning activity relevant to the task-at-hand. The nature of these organisations could be as diverse as corporate entities, educational institutions, other municipal bodies, the senior levels of government and special interest organisations as varied as chambers of commerce and housing advocacy groups.

First, this "programme " would identify individuals whose services could be obtained by the towns and provide the municipality basic information describing the backgrounds of those persons and their areas of expertise. It would, then, be the responsibility of the town to contact the person (or persons) desired, work out, with them, the details of the service the resource person would provide and arrange for that person's visit to the town to discuss the matter-at-hand with the groups or persons involved. The cost of the resource personnel time and all travel expenses should, in this case, be paid by the provincial government, as the body controlling planning legislation and activity.

It is hoped that such a programme would compliment the recommended course of action vis-a-vis prospective owners and would assist the small resource towns by giving them access to advice from experienced persons with whom they would not, normally, have the opportunity to meet. Exposure to such persons could serve as the fodder which would help them to produce, in the case of



housing, affordable serviced land within a framework that would allow them to meet a number of goals and, at the same time, help them to extract themselves from at best the mediocrity that appears all too often as the norm both in planning activities and, in the built-environment in these small mid-northern communities.

A P P E N D I X IDETAILED CONSTRUCTION COST ESTIMATES  
FOR THE YEARS 1963, 1973 AND 1983

Following are detailed estimates listing broken-down totals for materials and items of labour related to those phases of construction listed in the tables appearing in the body of this report.

These estimates reflect costs for a detached, single-storey, single-family house containing one bathroom, three bedrooms, a kitchen, a combined living-dining area, and a full basement.

The design was drawn from "Small House Designs" (1958 Edition), published by the Central Mortgage and Housing Corporation, Ottawa, Canada; and appears as Design Number 231 on pages 22 and 23 of that edition.

Plan, elevation, and perspective views of this house have been included as part of Appendix II.

Detailed Construction Cost Estimate For 1963MATERIALSI FOUNDATIONSI.1 Footings:

300 lin ft	2x10 forming @ 0.15	45.00	
248 lin ft	2x4 forming @ 0.06	14.88	
280 lin ft	#4 reinforcing steel @ .105/lb	30.24	
6½ cu yds	3,000 psi concrete @ 14.40	93.60	
			183.72

I.2 Foundation Walls:

1,300 only	10" concrete blocks @ 0.33	429.00	
800 lin ft	10" joint reinforcing @ .035	28.00	
22 bags	portland cement @ 1.35	29.70	
22 bags	masonry cement @ 1.30	28.60	
5 cu yds	masonry sand @ 3.00	15.00	
17 only	8" x ½" anchor bolts @ 0.25	4.25	
5 gal	asphalt emulsion @ 6.95	6.95	
6 only	basement windows @ 12.75	76.50	
			618.00

I.3 Basement Floor and Drainage:

200 lin ft	weeping tile @ 0.15	30.00	
10 cu yds	washed stone @ 2.54	25.40	
23 cu yds	gravel @ 1.50	34.50	
9½ cu yds	3,000 psi concrete @ 14.40	136.80	
			226.70

II ROUGH FRAMINGII.1 Beams and Posts:

3 only	3" teleposts @ 9.75	29.25	
168 lin ft	2 x 8 lumber @ 0.12	20.16	
			49.41

II.2 Sill Plates:

130 lin ft	2 x 4 bridging @ .06	7.80	
			7.80

II.3 Floor Joists and Sub-Floor:

126 pcs	2 x 2 bridging @ .06	7.56	
984 lin ft	2 x 10 lumber @ .15	147.60	
20 lin ft	2 x 6 lumber @ .09	1.80	
33 sheets	4 x 8 x 5/8" plywood T & G @ 6.60	217.80	
			374.76

II.4 Walls - Framing and Sheathing:

846 lin ft	2 x 4 wall plates @ .06	50.76	
128 lin ft	2 x 4 16' lumber @ .06	7.68	
330 pcs	2 x 4 studs @ .48 ea	158.40	
116 lin ft	2 x 6 lumber @ .09	10.44	
72 lin ft	2 x 10 lumber @ .15	10.80	
16 lin ft	2 x 4 lumber @ .09	.96	
33 sheets	4' x 9' x 1/2" BP board @ 2.85 ea	111.15	
5 tubes	caulking @ .60	3.00	
			353.19

II.5 Roof Construction:

904 lin ft	2 x 6 lumber @ .09	81.36
1,024 lin ft	2 x 8 lumber @ .12	122.88
46 lin ft	1 x 10 fascia lumber @ .07	3.22
96 lin ft	2 x 10 grooved fascia @ .18	17.18
448 lin ft	2 x 4 lumber @ .06	26.88
64 lin ft	2 x 10 lumber @ .18	11.52
45 sheets	4 x 8 x 3/8" plywood @ 6.49	292.05
144 lin ft	2 x 2 lumber @ .03	4.32
7 sheets	4 x 8 x 3/8" GIS plywood @ 6.60 ea	46.20
152 lin ft	1 x 6 lumber @ .045	6.84
10 only	16" x 8" soffit vents @ 1.23	12.30
2 only	ridge vents @ 2.40	4.80
4 only	rooftop vents @ 3.60	14.40
3 rolls	45 lb roll roofing @ 3.00	9.00
15 sp	210# asphalt shingles @ 11.10	166.50
18 lb	roofing nails @ .13	2.34

821.89

II.6 Windows and Entrances:

5 only	casement windows 48" x 40" @ 68.50	342.50
2 only	casement windows 25" x 40" @ 36.60	73.20
1 only	sealed window 114" x 63" @ 228.75	228.75
1 only	front entry pre-hung @ 78.50	78.50
1 only	side entry pre-hung @ 65.70	65.70
2 only	aluminum storm doors \$ 33.40	66.80

854.55

III EXTERIOR FINISH CARPENTRY

4 rolls	permax building paper @ 1.95	7.80
1,200 bd ft	10" bevel cedar siding @ 210/ f bm	252.00
25 lb	oval head siding nails @ .13	3.25

263.05

IV INSULATION AND DRYWALL

30 bales	4" x 15" batt insulation @ 6.00	180.00
3 rolls	4 mil polyethylene @ 23.40	70.20
23 bales	6" x 15" batt insulation @ 6.95	159.85
4,013 sq ft	½" drywall @ .07	280.90
1,600 lin ft	joint tape @ 1.60/roll	11.20
8 bags	joint filler @ 3.85	30.80
8 pcs	corner bead @ .45	3.60
30 lbs	drywall nails @ .24	7.20

743.75

V INTERIOR FINISH CARPENTRY

1 set	stairs (10 open risers) @ 54.80	54.80
1 set	stairs (3 closed risers) @ 24.25	24.25
5 only	pre-hung mahogany doors @ 22.70	113.50
2 only	3' x 6' x 8" bi-fold doors @ 21.21	42.40
1 only	handrail brackets @ .40	2.40
93 lin ft	4½" door jamb @ .11	10.23
600 lin ft	2½" mahogany casing @ .08	48.00
400 lin ft	2¼" mahogany base @ .09	36.00
2 sheets	½" fir plywood GIS @ 6.70	13.40

20 lin ft	wood dowel @ 0.12	2.40
1 only	72" base kitchen cabinet @ 103.25	103.25
1 only	36" base cabinet @ 56.65	56.65
2 only	30" base cabinets @ 56.65	113.30
1 only	48" upper cabinet @ 39.90	39.90
1 only	36" upper cabinet @ 29.95	29.95
1 only	95" upper cabinet @ 70.55	70.55
6 sheets	¼" underlay plywood @ 4.26	25.56
1 box	7/8" staples @ 1.50	1.50
4 only	passage sets @ 3.10	12.40
1 only	privacy set @ 3.85	3.85
2 only	entry hardware sets @ 7.40	14.80
2 sets	weatherstripping @ 3.25	6.50
2 pcs	threshold weatherstripping @ 1.49	2.98

908.23

VI FINISH FLOORING

104 sq ft	vinyl asbestos tile @ .21	21.84
101 sq yd	carpet and underlay @ 6.95	701.95
	miscellaneous accessories	15.00

738.79

VII INTERIOR FINISHES (PAINT AND CERAMIC TILE)

60 sq ft	ceramic tile @ 0.81	48.60
1 gal	glue @ 5.79	5.79
1 bag	grout (5 lb) @ 1.59	1.59
13 gal	paint (primer) @ 6.45	83.85

20 gal	latex paint @ 6.45	129.00	
1 gal	satin varnish @ 8.75	8.75	
1 gal	wood stain @ 8.75	8.75	
			285.83

VIII EXTERIOR FINISHES

10 gal	paint (siding) @ 7.95	79.50	
2 gal	paint (trim) @ 7.95	7.95	
1 only	mail box @ 4.45	4.45	
			99.85

IX MISCELLANEOUS ITEMS AND TRIM

1 only	soap dish @ 3.95	3.95	
1 only	medicine chest @ 29.95	29.95	
1 only	paper holder @ 2.67	2.67	
1 only	24" towel bar @ 2.89	2.89	
4 boxes	nails (200 lbs) @ 0.13/lb	26.00	
			65.46

X ELECTRICAL

X.1 100 Ampere House Service:

1 only	mast assembly @ 37.45	37.45	
1 only	meter assembly @ 21.69	21.69	
1 only	24 circuit panel @ 17.50	17.50	
1 only	100 amp DP breaker @ 3.99	3.99	
1 only	40 amp DP breaker @ 2.89	2.89	
1 only	30 amp DP breaker @ 2.89	2.89	
4 only	15 amp DP breakers @ 5.99	23.46	



10 only	15 amp SP breakers @ 2.89	28.90
63 lin ft	#3 TWH copper cable @ .20	12.60
30 lin ft	#6 bare copper cable @ .07	2.10
	miscellaneous items	5.97

159.44

X.2 Branch Circuit Wiring:

	boxes and connectors	40.59
580 lin ft	14/2 lumex wire @ .07	40.60
290 lin ft	14/3 lumex wire @ .14	40.60
8 lin ft	14/2 BX wire @ .14	1.12
35 lin ft	10/3 lumex wire @ .29	10.15
35 lin ft	8/3 wg lumex wire @ 308/M	10.78
150 lin ft	20/2 bell wire @ .04	6.00
	staples, nuts, etc.	3.50
12 only	SP switches (ivory) @ .28	3.36
6 only	3-way switches @ .46	2.76
	switch plates	2.95
21 only	receptacles @ .22	4.62
21 only	receptacle plates @ .15	3.15
1 only	w/p box and receptacle @ 4.88	4.88
1 only	kitchen exhaust fan @ 31.95	31.95
1 only	bathroom exhaust fan @ 31.95	31.95
2 sets	fan ductwork	21.94
2 only	fan roof caps @ 3.45	6.90

258.80

X.3 Fixtures:

1 only	door chime kit @ 12.75	12.75
2 only	outside door fixtures @ 2.95	5.90
4 only	hall and entry fixtures @ 4.25	17.00
1 only	kitchen fixture @ 5.75	5.75
3 only	3-lamp square bedroom fixtures	10.50
1 only	2-lamp bathroom fixture @ 5.95	5.95
1 only	3-lamp dining room fixture @ 25.95	25.95
3 only	pull-chain lampholders @ .64	1.92
1 only	porcelain lampholder @ .39	.39
	light bulbs	1.60
	miscellaneous materials	7.00

92.71

XI HEATING

1 only	110,000 BTU furnace	249.00
1 only	insulated chimney assembly	133.10
2 only	bonnets 20" x 14" x 36" @ 18.00	36.00
4 only	bonnet takeoffs @ 10.00	40.00
20 pcs	18" x 10" duct x 36" @ 2.80	56.00
4 only	18" x 10" end caps @ .50	2.00
8 only	joist liner x 36" long @ 1.50	12.00
5 only	joist plugs @ .65	3.25
10 only	5" x 7" - 5" ( ) dia. top take-off	8.40
10 only	2¼" x 12" x 5" end boots @ .90	9.00
150 lin ft	5" dia. x 28 ga pipe @ .95	142.50

8 only	5" dia elbows @ .90	7.20
20 only	joist pipe hangers @ .10	2.00
76 lin ft	S clips @ .12	9.12
48 lin ft	drive clips @ .13	6.24
10 only	2½" x 12" floor grilles @ 1.80	18.00
5 only	6" x 18" wall grilles @ 1.55	7.75
1 only	plate humidifier @ 13.40	13.40
	gas piping materials	15.41

760.37

XII PLUMBING

4 only	4" hub-type running trap @ 3.90	15.60
4 only	4" hub Y @ 3.19	12.76
1 only	4 x 4 x 2 hub Y @ 2.90	2.90
1 only	4" HS 90° bend @ 1.98	1.98
4 only	4" HS 45° bends @ 1.67	6.68
1 only	4 x 3 HS reducer @ 1.34	1.34
1 only	3 x 3 x 3 hub Y @ 3.08	3.08
2 only	3 x 3 x 2 hub Y @ 2.19	4.38
1 only	3" HS 90° bend @ 1.49	1.49
1 only	3" HS 45° bend @ 1.25	1.25
1 only	2" HS 45° bend @ 0.92	.92
6 only	4" malcolm cleanouts @ 2.80	16.80
1 only	2" malcolm cleanout @ 1.63	1.63
2 only	2 x 1½ copper reducers @ 1.10	2.20
1 only	2 x 1¼ copper reducers @ 0.96	.96

1 only	3" lead stub with flange @ 9.83	9.83	
90 lin ft	4" HS pipe (14 hubs) @ 1.39	125.10	
20 lin ft	3" HS pipe (3 hubs) @ 1.20	26.00	
20 lin ft	2" HS pipe (3 hubs) @ 0.90	18.00	
1 only	1½" brass p-trap @ 2.05	2.05	
1 only	1½" copper DWV 90° bend @ .69	.69	
1 only	1¼" copper DWV 90° bend @ .51	.51	
10 lin ft	1½" DWV pipe @ 0.77	7.70	
10 lin ft	1¼" DWV pipe @ 0.62	6.20	
2 only	20" x 20" roof flashings @ 2.20	4.40	
	oakum and lead (20 joints)	19.00	
			293.45
1 only	½" gate valve @ 1.39	1.39	
1 only	½" globe valve @ 1.89	1.89	
2 only	3/4" x 1/2" copper adaptors @ .23	.46	
6 only	½" x ½" x ½" Tees @ .19	1.14	
18 only	½" x ½" x 90° bends @ 0.11	1.98	
120 lin ft	½" type M copper tube @ 0.27	32.40	
			39.26
1 only	bathtub @ 66.75	66.75	
1 only	toilet c/w seal @ 36.59	36.59	
1 only	lavatory @ 19.33	19.33	
1 only	double compartment sink	34.00	
5 only	flex supplies	14.45	
1 only	40 gal hot water tank	94.50	

1 only	laundry tub and faucets	55.00	
	miscellaneous supplies	5.00	
	outside faucet	1.12	
	permit	5.00	
			331.74

LABOUR COSTSI FOUNDATIONSI.1 Footings:

form footings (132 ft)	carpenter 13½ h @ 2.90	39.15	
place steel/concrete	labourer 4h @ 2.30	9.20	
strip and clean forms	labourer 1½h @ 2.05	3.08	
spread gravel	labourer 8h @ 2.05	16.40	
			67.83

I.2 Foundation Walls:

lay 1,300 pc 10" block	mason 64h @ 3.30	211.20	
mix mortar etc.	labourer 80h @ 2.15	172.00	
paring	mason 8h @ 3.30 labourer 8h @ 2.15	43.60	
dampproofing	labourer 8h @ 2.05	16.40	
			443.20

I.3 Basement Floor and Drainage:

place concrete	cement finisher 24h @ 2.65	63.60	
install weeping tile	labourer 8h @ 2.05	16.40	
			80.00

II ROUGH FRAMINGII.1 Beams and Posts:

construct floor beam carpenter 4h @ 2.90	11.60	
		11.60

II.2 Sill Plates:

install plates carpenter 6h @ 2.90	17.40	
		17.40

II.3 Floor Joists and Subfloor:

install floor framing carpenter 20h @ 2.90	58.00	
nail bridging carpenter 2-3/4h @ 2.90	7.98	
install subfloor carpenter 12h @ 2.90	34.80	
		100.78

II.4 Walls - Framing and Sheathing:

frame and sheathe exterior walls carpenter 24h	69.60	
frame interior partitions carpenter 18h @ 2.90	52.20	
		121.80

II.5 Roof Construction:

ceiling joists carpenter 18h @ 2.90	52.20	
ridge board carpenter 1h @ 2.90	2.90	
rafters carpenter 24h @ 2.90	69.60	
fascia board carpenter 1 1/4h @ 2.90	3.63	
gable end and ladders carpenter 8h @ 2.90	23.90	
plywood sheathing carpenter 23h @ 2.90	66.70	
coilar ties carpenter 4 1/2h @ 2.90	13.05	
soffit carpenter 15h @ 2.90	43.50	

100

shingles carpenter 26h @ 2.90	75.40	
eave protection carpenter 2h @ 2.90	5.80	
		355.98

II.6 Windows and Entrances:

install windows carpenter 8h @ 2.90	23.20	
install sealed unit carpenter 2½h @ 2.90	7.25	
entrance doors carpenter 2½h @ 2.90	6.53	
aluminum doors carpenter 2h @ 2.90	5.80	
		42.70

II.7 Exterior Finish Carpentry:

permax and cedar siding carpenter 66h @ 2.90	191.40	
		191.40

IV Insulation and Drywall:

install insulation carpenter 10½h @ 2.90	30.45	
vapour barrier carpenter 4h @ 2.90	5.80	
install drywall carpenter 24h @ 2.90	69.60	
tape/fill/sand drywall carpenter 27h @ 2.90	78.30	
		195.75

Interior Finish Carpentry:

basement stairs carpenter 2h @ 2.90	5.80	
install handrail carpenter 1h @ 2.90	2.90	
interior doors carpenter 3 h @ 2.90	8.70	
door casings carpenter 5h @ 2.90	14.50	
closet door frames carpenter 6½h @ 2.90	18.85	
closet door casings carpenter 5h @ 2.90	14.50	

bi-folds carpenter 6h @ 2.90	17.40
window casings carpenter 6h @ 2.90	17.40
baseboards carpenter 10h @ 2.90	29.00
door hardware carpenter 2½h @ 2.90	7.25
underlay carpenter 3h @ 2.90	8.70
closet shelves carpenter 2h @ 2.90	5.80
trim attic access hatch carpenter 1½h @ 2.90	3.63
kitchen cabinets carpenter 8h @ 2.90	23.20
weatherstrip doors carpenter 2h @ 2.90	5.80
	183.43

VI Finish Flooring:

install floor tile carpet installer 2h @ 2.40	4.80
carpet and underlay carpet installer 17h @ 2.40	40.60
	45.40

VII Interior Finishes (Paint and Ceramic Tile):

ceramic tile tile setter 8h @ 2.65	21.20
paint primer painter 10h @ 2.45	24.50
finish coats painter 20h @ 2.45	49.00
stain and varnish painter 62h @ 2.45	151.90
cleanup painter 5h @ 2.45	12.25
	258.85

VII Exterior Finishes:

paint siding painter 42h @ 2.45	102.90
paint trim painter 14h @ 2.45	34.30
	137.20



IX Miscellaneous Items and Trim:

miscellaneous labour labourer 12h @ 2.05	24.60	
pick-up and delivery labourer 16h @ 2.05	32.80	
supervision 30 days @ 1½h/day @ 30./day	168.75	
bathroom trim carpenter 1½h @ 2.90	4.35	
timekeeping 44 days @ 1h/day @ 1.80/h	79.20	
		309.70

X ELECTRICAL INSTALLATION

install service electrician 8h @ 3.15	25.20	
rough-in house wiring electrician 24h @ 3.15	75.60	
trim-off fixtures etc. electrician 12h @ 3.15	37.80	
		138.60

XI HEATING INSTALLATION

install plumbing rough-in and trim plumber 80h @ 2.90	232.00	
		232.00

EQUIPMENT RENTALS

backhoe to excate basement and loader to backfill	100.00	
2 only aluminum storm doors @ 38.50	77.00	
		1,166.10

Detailed Construction Cost Estimate For 1973MATERIALSI FOUNDATIONSI.1 Footings:

300 lin ft	2 x 10 forming @ .42	126.00	
248 lin ft	2 x 4 forming @ .19	47.12	
280 lin ft	#4 reinforcing steel @ .12/lb	22.56	
6½ cu yds	3,000 psi concrete @ 23.70	154.05	
			349.73

I.2 Foundation Walls:

1,300 only	10" blocks @ .41 ea.	533.00	
800 Lin ft	10" joint reinforcing @ .07	56.00	
22 bags	portland cement @ 2.00	44.00	
22 bags	masonry cement @ 1.80	39.60	
5 cu yds	masonry sand @ 4.79	23.96	
17 only	8" x ½" dia. anchor bolts @ .76	12.92	
5 gal	asphalt emulsion @ 8.95/pail	8.95	
6 only	basement windows @ 16.95	101.70	
			820.13

I.3 Basement Floor and Drainage:

200 lin ft	weeping tile @ 44.60/250 lf	35.68	
10 cu yds	washed stone @ 3.14/ton	53.38	
23 yds	gravel @ 2.00	46.00	
9½ cu yds	3,000 psi concrete @ 23.70	225.15	
			360.21

II ROUGH FRAMING CARPENTRYII.1 Beams and Posts:

3 only	3" teleposts @ 10.70	32.10	
168 lin ft	2 x 8 lumber @ .29	48.72	
			80.82

II.2 Sill Plates:

130 lin ft	2 x 4 lumber @ .13	16.90	
			16.90

II.3 Floor Joists and Sub-Floor:

126 pcs	2 x 2 bridging @ .12	15.12	
984 lin ft	2 x 10 lumber @ .37	364.08	
20 lin ft	2 x 6 lumber @ .22	44.00	
33 sheets	4' x 8' x 5/8" T & G plywood @ 9.20	303.60	
			726.80

II.4 Walls - Framing and Sheathing:

846 lin ft	2 x 4 wall plates @ .13	109.98	
128 lin ft	2 x 4 x 16' @ .13	16.64	
330 pcs	2 x 4 studs @ 1.06	349.80	
116 lin ft	2 x 6 lumber @ .32	37.12	
72 lin ft	2 x 10 lumber @ .37	26.64	
16 lin ft	2 x 4 lumber @ .13	2.14	
33 sheets	4' x 9' x 1/2" BP board @ 2.90	95.70	
5 tubes	caulking @ 3.50	17.50	
			655.52

II.5 Roof Construction:

904 lin ft	2 x 6 lumber @ .22	198.88
1,024 lin ft	2 x 8 lumber @ .29	296.96
46 lin ft	1 x 10 ridge board @ .18	8.28
96 lin ft	2 x 10 grooved fascia @ .44	42.24
448 lin ft	2 x 4 lumber @ .14	62.72
64 lin ft	2 x 10 lumber w/groove @ .44	28.16
45 sheets	4' x 8' x 3/8" plywood @ 5.40	243.00
200 pcs	plywood clips @ .03	6.00
144 lin ft	2 x 2 lumber @ 198.00/fbm	10.08
7 sheets	4' x 8' x 3/8" GLS plywood @ 8.40	58.80
152 lin ft	1 x 6 lumber @ 215.00/fbm	16.72
10 only	16" x 8" soffit vents @ 3.25	32.50
2 only	ridge vents @ 10.95	21.80
4 only	rooftop vents @ 6.95	10.95
3 rolls	45 lb roll roofing @ 3.80	10.40
15 sq	210 lb shingles @ 3.95/bdl	177.75
18 lb	roofing nails @ .32	5.76
		1,247.85

II.6 Windows and Entrances:

5 only	casement windows 48" x 40" @ 116.50	582.50
2 only	casement windows 25"x40" @ 58.95	117.90
1 only	sealed window 114"x63" @ 204.75	204.75
1 only	front entry (pre-hung) @ 108.95	108.95
1 only	side entry (pre-hung) @ 75.00	75.00

III EXTERIOR FINISH CARPENTRY

4 rolls	permax building paper @ 3.80	15.20
1,200 bd ft	10" bevel cedar siding @ 614 fbm	739.20
96 only	metal corners @ 0.24	23.04
25 lb	oval head siding nails @ .27	6.75
4 tubes	caulking @ 3.50	14.00

798.19

IV INSULATION AND DRYWALL

30 bales	4" x 15" batt insulation @ 7.80	234.00
3 rolls	4 mil polyethylene	56.30
23 bales	6" x 15" batt insulation @ 9.65	221.95
4,013 sq ft	¼' drywall @ .09	361.20
1,600 lin ft	joint tape @ 1.30/roll	5.20
8 bags	joist filler @ 3.80	30.40
8 pcs	corner bead @ .40	3.20
30 lbs.	drywall nails @ .27	5.40
2,000 pcs	1¼" drywall screws @ 10.50/M	21.00

938.65

V INTERIOR FINISH CARPENTRY

1 set	stairs (10 open risers)	101.50
1 set	stairs (3 closed risers)	39.50
5 only	pre-hung mahogany doors @ 39.90	199.20
2 only	3' x 6' - 8" bi-fold doors @ 30.05	60.10

1 only	2' x 6' x 8" bi-fold door @ 23.75	23.75
2 only	4' x 6' x 8" bi-fold doors @ 42.35	84.70
12 lin ft	handrail @ .35	4.20
6 only	handrail brackets @ .59	3.54
93 lin ft	4½" door jamb @ .30	27.90
600 lin ft	2¼" casings @ .15	90.00
400 lin ft	2¼" mahogany base @ .16	64.00
2 sheets	4' x 8' x ½" fir plywood GIS @ 9.85	17.90
20 lin ft	wood dowel @ .38	7.60
1 only	72" base cabinet	149.85
1 only	36" base cabinet	84.50
2 only	30" base cabinets @ 84.50	169.00
1 only	48" upper cabinet	53.50
1 only	36" upper cabinet	42.00
1 only	96" upper cabinet	88.00
6 sheets	4' x 8' x ¼" underlay plywood @ 6.65	39.90
1 box	7/8" staples @ 9.00	9.00
4 only	passage hardware sets @ 4.65	18.60
1 only	privacy set @ 5.45	5.45
2 only	entry hardware set @ 10.25	20.50
2 sets	weatherstripping @ 8.15	16.30
2 pcs	threshold stripping @ 1.80	3.60

1,424.09

VI FINISH FLOORING

104 sq ft	vinyl asbestos tile @ .27	28.08	
101 sq yd	carpet and underlay @ 10.95	1,105.95	
	miscellaneous accessories	24.00	
			1,158.03

VII INTERIOR FINISHES (PAINT AND CERAMIC TILE)

60 sq ft	ceramic tile @ 1.00	60.00	
1 gal	glue @ 10.00	10.00	
1 bag	grout (5 lb) @ 2.49	2.49	
13 gal	primer paint @ 10.95	142.35	
20 gal	latex paint @ 10.95	219.00	
1 gal	satin varnish @ 12.99	12.99	
1 gal	wood stain @ 12.99	12.99	
			459.82

VIII EXTERIOR FINISHES

10 gal	paint (siding) @ 10.95	109.50	
2 gal	paint (trim) @ 10.95	21.90	
1 only	mail box @ 7.95	7.95	
			139.35

IX MISCELLANEOUS ITEMS AND TRIM

1 only	soap dish @ 3.95	3.95	
1 only	medicine chest @ 29.95	29.95	
1 only	paper holder @ 2.67	2.67	
1 only	24" towel bar @ 2.89	2.89	
4 boxes	nails (200 lbs) @ 14.00	56.00	
			95.46

X ELECTRICALX.1 100 Ampere House Service:

1 only	mast assembly	21.69
1 only	meter assembly	32.14
1 only	24 circuit panel @ 24.75	24.75
1 only	100 amp DP breaker @ 12.80	12.80
1 only	40 amp DP breaker @ 5.78	5.78
1 only	30 amp DP breakers @ 5.78	5.78
4 only	15 amp DP breakers @ 4.29	17.16
10 only	15 amp SP breakers @ 2.89	28.90
63 lin ft	#3 TWH cable @ 0.19	11.97
30 lin ft	#6 bare copper cable @ .10	3.00
	miscellaneous items	11.80

175.77

X.2 Branch Circuit Wiring:

	boxes and connectors	41.72
580 lin ft	14/2 lumex wire @ 0.65	37.70
290 lin ft	14/3 lumex wire @ 113.93/M	33.04
8 lin ft	14/2 BX cable @ 14.80/C	1.19
35 lin ft	10/3 lumex wire @ 1.18	41.30
35 lin ft	8/3 lumex wire @ 376/M	13.19
150 lin ft	20/2 bell wire @ 21.15/M	31.72
	staples, nuts, etc.	8.15
12 only	SP switches @ 0.78	9.15
6 only	3-way switches @ 1.16	6.96



	switch plates	3.00
21 only	receptacles @ 0.60	12.60
21 only	receptacle plates @ 0.15	3.15
1 only	w/p receptacle and box	3.70
1 only	range receptacle @ 2.10	2.10
1 only	kitchen exhaust fan @ 21.50	21.50
1 only	bathroom exhaust fan @ 21.50	21.50
2 sets	fan ductwork @ 10.90	21.80
2 only	fan roof caps @ 9.95	19.90
		333.58

X.3 Fixtures:

1 only	door chime kit	23.95
2 only	outside door fixtures @ 4.45	8.90
4 only	hall and entry fixtures @ 5.99	23.96
1 only	kitchen fixture @ 7.99	7.99
3 only	3-lamp square bedroom fixtures	29.85
1 only	2-lamp bathroom fixture	13.01
1 only	3-lamp dining room fixture	26.99
3 only	pull chain lampholders @ .79	2.61
1 only	porcelain lampholder @ .59	.59
	light bulbs	1.70
	miscellaneous items	20.00
		159.55

XI HEATING

1 only	100,000 BTU furnace	389.00
--------	---------------------	--------

1 only	insulated chimney assembly	54.60
2 only	bonnets 20" x 14½" x 36" @ 21.36	43.26
4 only	bonnet take-offs @ 11.20	44.80
20 pcs	18" x 10" duct x 36" @ 8.50	170.00
4 only	18" x 10" end caps @ 1.04	4.16
8 only	joist liner x 36" long @ 1.88	15.04
5 only	joist plugs @ 1.12	5.60
10 only	5" x 7" x 5" dia top take-off @ 1.68	16.80
10 only	2½" x 12" x 5" end boots @ 1.74	17.40
150 lin ft	5" dia galvanised pipe @ 1.04	156.00
8 only	5" dia elbows @ 1.06	8.46
20 only	joist pipe hangers @ 0.35	7.00
76 lin ft	S clips @ 0.17	12.92
48 lin ft	drive clips @ 0.14	6.72
10 only	2½" x 12" floor grilles @ 1.30	13.00
5 only	6" x 18" wall grilles @ 3.00	15.00
1 only	plate-type humidifier @ 42.50	42.50
	gas piping materials	15.28
		1,037.54

XII PLUMBING

3 only	4 x 4 x 4 Y ABS @ 5.20	15.60
1 only	4 x 4 x 4½ ABS Y @ 4.85	4.85
1 only	4 x 90° bend @ 4.60	4.60
4 only	4 x 45° bends @ 3.98	15.92
1 only	4 x 3 reducer @ 1.77	1.77

2 only	4" cleanouts @ 3.73	7.46
1 only	4" in-line cleanout @ 3.73	3.73
1 only	3 x 3 x 3 TY @ 2.35	2.35
2 only	3 x 3 x 1½ TY @ 1.85	1.85
1 only	3 x 3 x 1¼ TY @ 1.85	1.85
1 only	3 x 1¼ reducer @ 0.90	.90
1 only	1½" in-line cleanout @ .80	.80
1 only	1½ x 1¼ x 1½ TY @ 0.68	.68
2 only	1½ x 90° bends @ 0.48	.96
1 only	1½" P-trap @ 1.65	1.65
1 only	test cap @ 0.13	.13
1 only	1¼" x 90° bend @ 0.44	.44
2 only	20" x 20" roof flashing @ 4.32	8.64
90 lin ft	4" ABS pipe @ 2.04	183.60
20 lin ft	3" ABS pipe @ 1.42	28.40
30 lin ft	1½" ABS pipe @ 0.54	16.20
		304.23
1 only	¾" gate valve @ 4.90	4.90
1 only	¾" globe valve @ 3.85	3.85
1 only	¾" x ¾" x ½" tee @ .60	.60
2 only	¾" male adaptors @ 0.82	1.64
4 only	½" x ½" p-Tees @ 0.28	1.12
14 only	½" x ½" x 90° bends @ 0.24	3.36
4 only	¾ x ¾ x 90° bends @ 0.34	1.36
1 only	¾ x ½ x ¾ Tee @ 0.83	.83

1 only	3/4 x 1/2 bushing @ 1.00	1.00	
96 lin ft	1/2" copper tube type M @ 0.31	29.76	
24 lin ft	3/4" copper tube Type M @ 0.51	12.24	
			60.66
1 only	bathtub c/w faucets	101.43	
1 only	toilet @ 78.68	78.68	
1 only	lavatory c/w faucets	47.72	
1 only	kitchen sink c/w faucets	65.99	
5 only	flex supplies	6.65	
1 only	40 gal hot water tank	97.49	
1 only	laundry tub c/w faucets	69.99	
1 only	outside faucet	8.49	
	miscellaneous supplies, permit	15.00	
			491.53

LABOUR COSTSI FOUNDATIONSI.1 Footings

form footings	carpenter 13 1/2h @ 6.75	91.10	
place steel/concrete	labourer 4h @ 5.55	22.20	
strip and clean forms	labourer 1 1/2h @ 5.55	8.30	
spread gravel	labourer 8h @ 5.55	44.40	
			166.00

I.2 Foundation Walls:

lay 10" block mason 64h @ 8.10	518.40	
mix mortar etc. labourer 80h @ 5.55	444.00	
parging mason 8h labourer 8h	109.20	
dampproofing labourer 8h @ 5.55	44.40	
		1,116.00

I.3 Basement Floor and Drainage:

place and finish concrete cement finisher 24h	144.90	
install weeping tile labourer 8h	109.20	
		188.40

II ROUGH FRAMING CARPENTRYII.1 Beam and Posts:

construct floor beam carpenter 4h	27.00	
		27.00

II.2 Sill Plates:

install plates carpenter 6h	40.60	
		40.60

II.3 Floor Joists and Sub-Floor:

install floor framing carpenter 20h	135.00	
nail bridging carpenter 2 3/4h	18.56	
install sub-floor carpenter 12h	81.00	
		234.56

II.4 Walls - Framing and Sheathing:

frame and sheathe exterior walls carpenter 24h	162.00	
frame interior partitions carpenter 18h	121.50	
		283.50

II.5 Roof Construction:

ceiling joists carpenter 18h	121.50	
ridge board carpenter 1h	6.75	
rafters carpenter 24h	162.00	
fascia board carpenter 1½h	8.44	
gable ends and ladders carpenter 8h	54.00	
plywood sheathing carpenter 23h	155.25	
collar ties carpenter 4½h	30.38	
soffit carpenter 15h	101.25	
shingles carpenter 26h	175.50	
eave protection carpenter 2h	13.50	
		828.57

II.6 Windows and Entrances:

install windows carpenter 8h	54.00	
install sealed unit carpenter 2½h	16.88	
entrance doors carpenter 2½h	6.75	
aluminum doors carpenter 2h	13.50	
		99.56

III EXTERIOR FINISH CARPENTRY

permax and siding installation carpenter 66h	445.50	
		445.50

IV INSULATION AND DRYWALL

install insulation carpenter 10½h	70.88	
vapour barrier carpenter 4h	27.00	
insulate at windows carpenter 2h	13.50	

install drywall carpenter 24h	162.00	
tape/fill/sand drywall carpenter 27h	182.25	
		455.63

V INTERIOR FINISH CARPENTRY

basement stairs carpenter 2h	13.50	
handrail carpenter 1h	6.75	
interior doors carpenter 3h	20.25	
door casings carpenter 5h	33.75	
closet door casings carpenter 5h	33.75	
closet door frames carpenter 6½h	43.88	
bi-folds carpenter 6h	40.50	
window casings carpenter 6h	40.50	
baseboards carpenter 10h	67.50	
door hardware carpenter 2½h	16.88	
underlay carpenter 3h	20.25	
closet shelves carpenter 2h	13.50	
trim attic access hatch carpenter 1½h	8.44	
kitchen cabinets carpenter 8h	54.00	
weztherstrip doors carpenter 2h	13.50	
		426.95

VI FINISH FLOORING

install tile carpet installer 2h @ 5.80	11.60	
carpet and underlay carpet installer 17h	98.60	
		110.20

VII INTERIOR FINISHES (PAINT AND CERAMIC TILE)

ceramic tile tile setter 8h @ 6.00	48.00	
paint primer painter 10h @ 5.80	58.00	
apply finish coats painter 20h	226.20	
staining and varnishing painter 62h	359.60	
cleanup painter 5h	29.00	
		720.80

VIII EXTERIOR FINISHES

paint siding painter 42h	243.60	
paint trim painter 14h	81.20	
		324.80

IX MISCELLANEOUS ITEMS AND TRIM

miscellaneous labour labourer 12h	66.60	
pickup and delivery labourer 16h @ 5.00	80.00	
supervision 30 days @ 1 $\frac{1}{2}$ h/day @ 64./day	360.00	
bathroom trim carpenter 1 $\frac{1}{2}$ h	10.13	
timekeeping 44 days @ 1h/day @ 3.50	154.00	
		670.73

X ELECTRICAL INSTALLATION

install service electrician 8h @ 7.50	60.00	
rough-in circuits electrician 24h	180.00	
electrical fixtures and trim electrician 12h	90.00	
		330.00



XI HEATING INSTALLATION

install furnace and ductwork tinsmith 32h @ 6.75	216.00	
		216.00

XII PLUMBING INSTALLATION

install plumbing rough-in and trim plumber 40h @ 6.75	270.00	
		270.00

XIII EQUIPMENT RENTALS

backhoe to excavate basement and loader to backfill	140.00	
		140.00

DETAILED CONSTRUCTION COST ESTIMATE FOR 1983MATERIALSI FOUNDATIONSI.1 Footings:

300 lin ft	2 x 10 lumber @ .54	162.00	
248 lin ft	2 x 4 lumber @ .21	59.50	
280 lin ft	10 mm reinforcing steel @ .35/lb	98.00	
6½ cu yds	3,000 psi concrete @ 68.00	442.00	
			761.50

I.2 Foundation Walls:

1,300 only	10" blocks @ 1.35	1,755.00	
800 lin ft	10" joint reinforcing @ .193	154.40	
22 bags	portland cement @ 6.55	144.10	
22 bags	masonry cement @ 5.00	110.00	
5 cu yd	masonry sand @ 25.00	125.00	
17 only	8" x ½" anchor bolts @ 2.10	35.70	
5 gal	asphalt emulsion @ 24.36	24.36	
6 only	basement windows @ 69.05	414.30	
			2,762.86

I.3 Basement Floor and Drainage:

200 lin ft	weeping tile @ 75./250 ft	75.00	
10 cu yds	washed stone @ 9.30/ton	120.90	
23 cu yds	gravel @ 2.40/ton	84.00	
9½ cu yds	3,000 psi concrete @ 68.00	686.00	

II ROUGH FRAMING CARPENTRYII.1 Beam and Posts:

3 only	3" teleposts @ 22.25	66.75	
168 lin ft	2 x 8 lumber @ .48	80.64	
			147.39

II.2 Sill Plates:

130 lin ft	2 x 4 lumber @ .23	29.90	
			29.90

II.3 Floor Joists and Sub-Floor:

126 pcs	2 x 2 bridging @ .25	31.50	
984 lin ft	2 x 10 lumber @ .60	590.40	
20 lin ft	2 x 6 lumber @ .33	6.60	
33 sheets	4' x 8' x 5/8" T & G plywood @ 15.50	511.50	
			1,140.00

II.4 Walls-Framing and Sheathing:

846 lin ft	2 x 4 wall plates @ .23	194.58	
128 lin ft	2 x 4 x 16' @ .23	29.44	
174 pcs	2 x 4 studs @ 1.85	321.90	
156	2 x 6 studs @ 3.15	491.40	
116 lin ft	2 x 6 lumber @ .33	38.28	
72 lin ft	2 x 10 lumber @ .60	43.20	
16 lin ft	2 x 4 lumber @ .23	3.68	
33 sheets	4' x 9' x 1/2" BP board @ 5.90	271.40	
5 tubes	caulking @ 3.85	19.30	
			1,413.18

II.5 Roof Construction:

904 lin ft	2 x 6 lumber @ .33	298.32
1,024 lin ft	2 x 8 lumber @ .45	460.80
46 lin ft	1" x 10" fascia board @ .28	12.88
96 lin ft	2 x 10 grooved fascia @ .70	67.20
45 sheets	4 x 8 x 3/8" plywood @ 12.45	560.30
448 lin ft	2 x 4 lumber @ .23	103.04
64 lin ft	2 x 10 grooved fascia @ .70	44.80
200 pcs	plywood clips @ .06	12.00
144 lin ft	2 x 2 lumber @ .12	17.30
7 sheets	4' x 8' x 3/8" GLS plywood @ 16.85	118.00
152 lin ft	1 x 6 lumber @ .15	22.80
10 only	16" x 18" soffit vents @ 2.92	29.20
2 only	ridge vents @ 20.75	41.50
4 only	roof top louvres @ 17.75	71.00
3 rolls	50 lb roofing felt @ 15.25	45.75
15 sq	210 lb asphalt shingles @ 31.80	477.00
18 lb	roofing nails @ .25	4.50
		2,386.75

II.6 Windows and Entrances:

5 only	casement window 48" x 40"	1,765.25
2 only	casement windows 25" x 40"	357.20
1 only	sealed window 114" x 63"	689.50
1 only	front entry (pre-hung)	135.00
1 only	side entry (pre-hung)	135.00

2 only	aluminum storm doors @ 125.00	250.00	
			3,331.95

III EXTERIOR FINISH CARPENTRY

4 rolls	permax building paper @ 10.95	43.80	
1,200 bd ft	10" bevel cedar siding	1,440.00	
96 only	metal corners @ .65	62.40	
25 lb	oval head siding nails @ 1.00	25.00	
4 tubes	caulking @ 3.85	15.40	
			1,586.60

IV INSULATION AND DRYWALL

64 pcs	insulation stops @ 0.50	32.00	
42 bales	6" x 15" batt insulation @ 16.30	684.60	
3 rolls	4 mil polyethylene @ 19.45	58.40	
28 bales	8" x 15" batt insulation @ 17.00	476.00	
4,013 sq ft	½" drywall @ 0.19	762.47	
1,600 lin ft	joint tape @ 4.30/roll	17.20	
8 bags	joint filler @ 7.45	59.60	
8 pcs	corner bead @ 1.25	10.00	
30 lbs	drywall nails @ .85	17.00	
2,000 pcs	1¼" drywall screws @ 3.00/lb	30.00	
			2,147.27

V INTERIOR FINISH CARPENTRY

1 set	stairs (10 open risers)	296.00	
1 set	stairs (3 closed risers)	138.95	
5 only	pre-hung mahogany doors	328.50	

2 only	3' x 6' x 8" bi-fold doors @ 46.50	93.00
1 only	2' x 6' x 8" bi-fold door @ 37.35	37.35
2 only	4' x 6' x 8" bi-fold doors @ 74.80	149.60
12 lin ft	handrail @ 1.50	18.00
6 only	handrail brackets @ 1.85	11.10
93 lin ft	4½" door jamb @ .80	74.40
600 lin ft	2¼" casing @ .32	192.00
400 lin ft	2¼" base @ .30	120.00
2 sheets	½" fir plywood GLS @ 24.00	48.00
20 lin ft	wood dowel @ .70	14.00
1 only	72" base cabinet	394.55
1 only	36" base cabinet	246.80
1 only	30" base cabinets @ 246.80	493.60
1 only	48" upper cabinet @ 148.40	148.40
1 only	36" upper cabinet	113.05
1 only	96" upper cabinet	232.20
6 sheets	¼" x 4' x 8' underlay plywood	77.40
1 box	7/8" staples @ 24.50	24.50
2 tubes	sub-floor adhesive @ 5.10	10.20
4 only	passage sets @ 13.25	53.00
1 only	privacy set @ 15.95	15.95
2 only	entry hardware sets @ 24.95	49.80
2 sets	weatherstripping @ 14.00	28.00
2 pcs	threshold weatherstripping	4.30

3,412.65

VI FINISH FLOORING

104 sq ft	sheet flooring @ 11.10/sy	128.27	
101 sq yds	carpet and underlay @ 15.95	1,610.95	
	miscellaneous accessories	45.00	
			1,784.22

VII INTERIOR FINISHES (PAINT AND CERAMIC TILE)

60 sq ft	ceramic tile @ 2.25	135.00	
1 gal	glue @ 17.80	17.80	
1 bag	grout (5 lb) @ 5.00	5.00	
13 gal	primer paint @ 15.69	203.97	
20 gal	latex paint @ 18.00	360.00	
1 gal	satin varnish @ 21.00	21.00	
1 gal	woodstain @ 21.00	21.00	
			763.77

VIII EXTERIOR FINISHES

10 gal	paint (siding) @ 23.85	238.50	
2 gal	paint (trim) @ 23.85	47.70	
1 only	mail box @ 12.95	12.95	
			299.15

IX MISCELLANEOUS ITEMS AND TRIM

1 only	soap dish @ 9.99	9.99	
1 only	medicine chest @ 56.99	56.99	
1 only	paper holder @ 9.99	9.99	
1 only	24" towel bar @ 8.99	8.99	
4 boxes	nails (200 lbs) @ 23.00	92.00	
			177.96

X ELECTRICAL INSTALLATIONX.1 100 Ampere House Service:

1 only	mast assembly	84.22
1 only	meter assembly	33.41
1 only	breaker panel	65.95
1 only	100 amp DP breaker	38.95
1 only	40 amp DP breaker	18.95
1 only	30 amp DP breaker	7.19
4 only	15 amp DP breakers @ 7.19	28.76
10 only	15 amp SP breakers @ 3.85	38.50
63 lin ft	#3 TWH copper cable @ 0.55	34.65
30 lin ft	#6 bare copper cable @ 0.20	6.00
	miscellaneous items	33.98
		390.56

X.2 Branch Circuit Wiring:

	boxes and connectors	89.10
580 lin ft	14/2 lumex cable @ 0.15	87.10
290 lin ft	14/3 lumex cable @ 0.25	72.50
8 lin ft	14/2 BX cable @ 0.39	3.12
35 lin ft	10/3 lumex @ 0.49	17.15
35 lin ft	8/3 lumex cable @ 0.86	30.10
150 lin ft	20/2 bell wire @ 0.07	10.50
	staples, nuts, etc.	19.04
12 only	SP switches (ivory)	15.48
6 only	3-way switches	13.14



	switch plates	7.20
21 only	receptacles @ 1.05	22.05
21 only	receptacle plates @ 0.31	6.51
1 only	range receptacle	3.99
1 only	ground fault receptacle	50.95
1 only	cover plate (weatherproof)	8.15
1 only	dryer receptacle	3.99
2 only	exhaust fans @ 25.95	51.90
2 sets	fan ductwork	10.00
2 only	fan roof caps	25.60
1 only	110 volt smoke detector	29.95
		577.52

X.3 Fixtures:

1 only	door chime kit	20.00
2 only	outside door fixtures	12.98
4 only	hall and entry fixtures	29.97
1 only	kitchen fixture	9.99
1 only	2 lamp bathroom fixture	15.69
3 only	3 lamp bedroom fixtures	14.94
1 only	3 lamp dining room fixture	29.95
3 only	pull-chain lampholders	7.47
1 only	procelain lampholder	1.43
	light bulbs	7.50
	miscellaneous materials	15.00

164.92

XI HEATING INSTALLATIONS

1 only	100,000 BTU furnace	590.00
1 only	insulated chimney assembly	262.95
2 only	bonnets 20 x 14½ x 36 @ 31.40	62.80
4 only	bonnet take-offs @ 18.00	72.00
20 pcs	18 x 10 duct x 36" @ 13.00	260.00
4 only	18 x 10 end caps @ 1.67	6.65
8 only	joist liner x 36" @ 2.88	23.04
5 only	joist plugs @ 1.49	7.45
10 only	2½ x 12 x 5 end boots @ 2.30	23.90
150 lin ft	5" dia galvanised pipe @ 0.86	129.00
8 only	5" dia elbows @ 1.59	12.72
20 only	joist pipe hangers x 14½"	10.00
76 lin ft	S clips @ 27.47/100 if	20.88
48 lin ft	drive clips @ 20.38/100 if	9.79
10 only	2½ x 12 floor grilles @ 1.99	19.90
5 only	6 x 18 wall grilles @ 3.79	18.95
1 only	plate type humidifier	68.95
1 only	thermostat	10.95
	gas piping materials	7.37
		1,617.22

XII PLUMBING INSTALLATIONS

3 only	4 x 4 x 4 Y ABS	18.87
1 only	4 x 4 x 1¼ Y	5.29
1 only	4 x 90° bend	5.69

4 only	4 x 45° bends	18.67
1 only	4 x 3 reducer	3.59
2 only	4" ABS cleanout	11.78
1 only	4" in-line cleanout	5.89
1 only	3 x 3 x 3 TY	4.29
2 only	3 x 3 x 1½ TY	4.78
1 only	3 x 3 x 1¼ TY	2.39
1 only	3 x 1¼ reducer	2.39
1 only	1½ in-line cleanout	1.29
1 only	1½ x 1¼ x 1½ TY	.79
2 only	1½ x 90° bends	1.38
1 only	P-trap 1½"	2.29
1 only	1½" test cap	.99
1 only	1¼" x 90° bend	.69
2 only	20 x 20 roof flashing	15.38
2 only	1½ x brass trap adaptor	11.38
1 only	1¼ x brass trap adaptor	3.89
10 lin ft	1¼ ABS pipe @ 0.15	5.10
30 lin ft	1½ ABS pipe @ 0.58	17.48
20 lin ft	3" ABS pipe @ 1.54	30.81
90 lin ft	4" ABS pipe @ 2.16	194.40
1 only	3/4" gate valve	5.99
1 only	3/4" globe valve	6.69
1 only	3/4 x 3/4 x 1/2 tee	.95

2 only	3/4 x male adaptors @ 1.15	2.30	
4 only	1/2 x 1/2 x 1/2 tees	1.56	
14 only	1/2 x 1/2 x 90° bends	3.78	
1 only	3/4 x 1/2 x 3/4 tee	.95	
1 only	3/4 x 1/2 bushing	1.15	
96 lin ft	1/2" type M copper tube @ 0.42	10.32	
24 lin ft	3/4" type M copper tube @ 0.75	18.00	
			451.19
1 only	tub c/w faucets	188.98	
1 only	toilet	156.92	
1 only	lavatory c/w faucets	68.88	
1 only	steel sink c/w faucets	119.98	
5 only	flex supplies	19.98	
1 only	40 gal hot water tank	219.98	
1 only	laundry tub c/w faucets	75.96	
			850.68

LABOUR COSTSI FOUNDATIONSI.1 Footings:

form footings	carpenter 13 1/2 h @ 18.05	81.23
place steel/concrete	labourer 4h @ 15.89	63.56
strip and clean forms	labourer 1 1/2 h @ 15.89	23.84
spread gravel	labourer 8h @ 15.89	127.12
		295.75

I.2 Foundation Walls:

lay 10" concrete block mason 64h @ 17.50	1,100.80	
mix mortar etc. labourer 80h @ 15.02	1,201.60	
paring mason 8h labourer 8h	257.76	
dampproofing labourer 8h @ 15.02	120.16	
		2,680.32

I.3 Basement Floor and Drainage:

place and finish concrete cement finisher 24h	389.52	
install weeping tile labourer 8h	127.12	
		516.64

II ROUGH FRAMING CARPENTRYII.1 Beam and Posts:

construct floor beam carpenter 6h @ 18.50	72.20	
		72.20

II.2 Sill Plates:

install plates carpenter 6h	108.30	
		108.30

II.3 Floor Joists and Sub-Floor:

install floor framing carpenter 20h	361.00	
nail bridging carpenter 2 3/4h	49.64	
install sub-floor carpenter 12h	216.60	
		627.74

II.4 Walls - Framing and Sheathing:

frame and sheathe exterior walls carpenter 24h	433.20	
frame interior partitions carpenter 18h	324.90	
		758.10

II.5 Roof Construction:

ceiling joists carpenter 18h	324.90
ridge board carpenter 1h	18.50
rafters carpenter 24h	433.20
fascia board carpenter 1½h	22.56
gable ends and ladders carpenter 8h	144.40
plywood sheathing carpenter 23h	415.15
collar ties carpenter 4½h	81.23
soffit carpenter 15h	270.75
shingles carpenter 26h	469.30
eave protection carpenter 2h	16.10
	2,195.64

II.6 Windows and Entrances:

install windows carpenter 8h	144.40
install sealed unit carpenter 2½h	45.13
entrance doors carpenter 2½h	40.6±
aluminum doors carpenter 2h	36.10
	266.24

III EXTERIOR FINISH CARPENTRY

permax and siding carpenter 66h	1,191.30
	1,191.30

IV INSULATION AND DRYWALL

install insulation carpenter 10½h	189.53
vapour barrier carpenter 4h	72.20
insulate at windows carpenter 2h	36.10

install drywall carpenter 24h	433.20	
tape/fill/sand drywall	487.35	
		1,218.38

V INTERIOR FINISH CARPENTRY

basement stairs carpenter 2h	36.10	
handrail carpenter 1h	18.05	
interior doors carpenter 3h	54.15	
door casings carpenter 5h	90.25	
closet door frames carpenter 6½h	177.33	
closet door casings carpenter 5h	90.25	
bi-folds carpenter 6h	108.30	
window casings carpenter 6h	108.30	
baseboards carpenter 10h	180.50	
door hardware carpenter 2½h	45.13	
underlay carpenter 3h	54.15	
closet shelves carpenter 2h	36.10	
trim attic access hatch carpenter 1¼h	22.56	
kitchen cabinets carpenter 8h	144.40	
weatherstrip doors carpenter 2h	36.10	
		1,141.67

VI FINISH FLOORING

sheet flooring carpet installer 2h @ 13.50	27.00	
carpet and underlay carpet installer	229.50	
		256.60

VII INTERIOR FINISHES (PAINT AND CERAMIC TILE)

ceramic tile	tile setter 8h @ 16.23	129.84	
paint primer	painter 10h @ 13.50	135.00	
finish coats	painter 20h @ 13.50	270.00	
staining and varnishing	painter 62h	837.00	
cleanup	painter 5h	67.50	
			1,439.34

VIII EXTERIOR FINISHES

paint siding	painter 42h	567.00	
paint trim	painter 14h	189.00	
			756.00

IX MISCELLANEOUS ITEMS AND TRIM

miscellaneous labour	labourer 12h	190.68	
pick-up and delivery	labourer 16h @ 12.00	192.00	
supervision	30 days @ 1½h/day @ 25.00	1,125.00	
bathroom trim	carpenter 1½h @ 18.05	27.08	
timekeeping	44 days @ 1h/day @ 10.00	440.00	
			1,974.76

X ELECTRICAL INSTALLATION

install electrical service	electrician 8h	147.28	
rough-in house wiring	electrician 24h	441.84	
electrical trim	electrician 12h	220.92	
			810.04



XI HEATING INSTALLATION

install furnace and ductwork	tinsmith		
40h @ 19.95		770.00	
			770.00

XII PLUMBING INSTALLATION

install plumbing rough-in and trim	plumber		
40h @ 19.25		770.00	
			770.00

XIII EQUIPMENT RENTALS

backhoe to excavate basement and loader to			
backfill		440.00	
			440.00

APPENDIX II

SURVEY QUESTIONNAIRE

Following is a copy of the questionnaire which, as part of the research work was circulated in the Town of Nipigon, Ontario during September of 1983.

The numbers shown in the blank spaces on the questionnaire indicate frequencies of responses to the individual questions.

HOUSING QUESTIONNAIRE -  
NIPIGON, ONTARIO

1. Please indicate your family-type:
- |                                       |       |
|---------------------------------------|-------|
| (a) 2 adults with no children         | _____ |
| (b) 2 adults supporting children      | 9     |
| (c) 1 adult (female) with no children | 16    |
| (d) 1 adult (male) with no children   | 1     |
| (e) 1 adult (female) with children    | _____ |
| (f) 1 adult (male) with children      | _____ |
2. Do you own or rent your present residence?
- |                   |                    |
|-------------------|--------------------|
| (a) own <u>13</u> | (b) rent <u>13</u> |
|-------------------|--------------------|
3. What is/are the age(s) of:
- |                                       |       |
|---------------------------------------|-------|
| (a) the male head of the household?   | 31.95 |
| (b) the female head of the household? | 30.75 |
4. How long have you lived in Nipigon?
- |   |
|---|
| (a) male household head <u>13.62</u> years, or<br>all of my life <u>6</u>   |
| (b) female household head <u>13.92</u> years, or<br>all of my life <u>5</u> |
5. If you are a tenant:
- |   |        |
|---|--------|
| (a) what is your current monthly rent?            | \$264. |
| (b) how long have you been renting in<br>Nipigon? | 5.74   |
6. If you were in the market for a new home,  
how much do you feel you could afford to  
spend per month in mortgage payments and  
not change your current life-style?
- |  |        |
|--|--------|
|  | \$410. |
|--|--------|

7. Would you consider building a new home in Nipigon?

(a) yes 19 (b) no 7

8. If you already own your own home, do you think it would be advisable for someone in the market for a new home to build there?

(a) yes 9 (b) no 4

If your answer is no, why not?

---



---

9. Are you saving towards the purchase of a new home in Nipigon?

(a) yes 11 (b) no 15

10. Are you saving towards the purchase of a new home elsewhere?

(a) yes 6 (b) no 18

11. If you are/were in the market for a new home, what do you expect a new home containing all those features which you would not want to be without, would cost in Nipigon?

(a) under \$50,000.	<u>5</u>
(b) \$50,000. - \$59,999.	<u>9</u>
(c) \$60,000. - \$69,999.	<u>5</u>
(d) \$70,000. - \$79,000.	<u>4</u>
(e) \$80,000. or more	<u>2</u>

12. If you are saving towards the purchase of a new home, do you have a Registered Home Ownership Savings Plan?

(a) yes 5 (b) no 8

13. If you were in the market for a new home, would you prefer to:
- |                                 |           |
|---------------------------------|-----------|
| (a) build your own              | <u>18</u> |
| (b) purchase a newly-built home | <u>7</u>  |
| (c) purchase an older home      | <u>1</u>  |
14. If you were to build or renovate, do you think that you would have enough knowledge related to building a house to allow you to act as your own general contractor:
- |         |           |        |           |
|---------|-----------|--------|-----------|
| (a) yes | <u>15</u> | (b) no | <u>11</u> |
|---------|-----------|--------|-----------|
15. What is the gross annual pay of the one (or two, if applicable) major wage earner in your household?
- |                    |                  |    |
|--------------------|------------------|----|
| (a) wage earner #1 | <u>\$24,964.</u> | 24 |
| (b) wage earner #2 | <u>\$12,400.</u> | 10 |
16. If you were working full-time ten years ago and can recall it, what was your gross annual pay at that time:
- |                    |                  |    |
|--------------------|------------------|----|
| (a) wage earner #1 | <u>\$15,555.</u> | 12 |
| (b) wage earner #2 | <u>\$ 9,667.</u> | 3  |
17. If you presently own your own house, how much is your current mortgage payment?
- |               |   |
|---------------|---|
| <u>\$255.</u> | 9 |
|---------------|---|
18. If you were to build a new house, how do you think you would most likely complete each of the following items:

	HIRE A TRADESMAN OR CONTRACTOR	DO IT YOURSELF	HIRE SOMEONE AND PAY CASH	DO IT YOURSELF WITH THE HELP OF PERSONS YOU WOULD NOT HAVE TO PAY
PREPARE DRAWINGS	6	8	5	3
PREPARE MATERIAL LISTS:				
FRAMING MATERIALS	9	5	3	9
ELECTRICAL SUPPLIES	10	6	4	5
PLUMBING SUPPLIES	7	6	6	7
HEATING SUPPLIES	12	3	6	5
EXCAVATE	10	0	4	4
BUILD A POURED BASEMENT	9	1	3	8
BUILD A MASONRY BASEMENT	9	3	3	8
ROUGH FRAMING CARPENTRY	7	4	3	10
SHINGLES	4	10	2	9
FINISHING CARPENTRY	5	9	4	8
INSULATION	5	9	2	10
INSTALL DRYWALL	5	2	1	12
TAPE & FILL WALLBOARD	7	7	1	10
INSTALL CUPBOARDS	4	8	4	10
PLUMBING WORK	7	4	7	7
ELECTRICAL WORK	7	8	5	5
HEATING WORK	8	6	4	8
FLOORING	4	10	1	11
WOOD SIDING	5	6	1	11
BRICK VENEER	12	2	3	6
STUCCO	9	2	3	7
PAINTING	0	13	1	8
CERAMIC TILE	1	10	2	8

19. How would you rate the following items?

	A NECESSITY	PREFERABLE AND AFFORDABLE	NOT NECESSARY	DESIRABLE BUT UNAFFORDABLE	DO YOU HAVE THIS NOW
3RD BEDROOM	14	7	0	5	
GARAGE	5	6	18	7	
2ND BEDROOM	19	2	0	2	
REC. ROOM	2	8	8	8	
SEPARATE DINING ROOM	2	7	12	4	
BRICK SIDING	1	5	15	3	
PATIO DOOR(S)	1	6	14	3	
TRIPLE GLAZED WINDOWS	7	3	8	7	
FIREPLACE	0	6	12	6	
AIR CONDITIONING	0	1	16	9	
2 CAR GARAGE	1	2	17	4	
DISHWASHER	6	5	12	3	
MICROWAVE OVEN	0	5	17	3	
CONVECTION OVEN	6	3	13	2	
DRYER	17	3	1	3	
2ND CAR OR TRUCK	5	6	7	7	
3RD CAR OR TRUCK	0	0	21	1	
CABLE TELEVISION	9	9	4	1	
SATELLITE DISH	2	2	18	3	

20. Attached are sketches of a three-bedroom bungalow. Please look these over and respond to the following question:

(a) If you were considering a new house, would this plan be acceptable to you:

(a) yes 19 (b) no 7

(b) If not, list a few major reasons why it would not be acceptable.

---

---

---

---

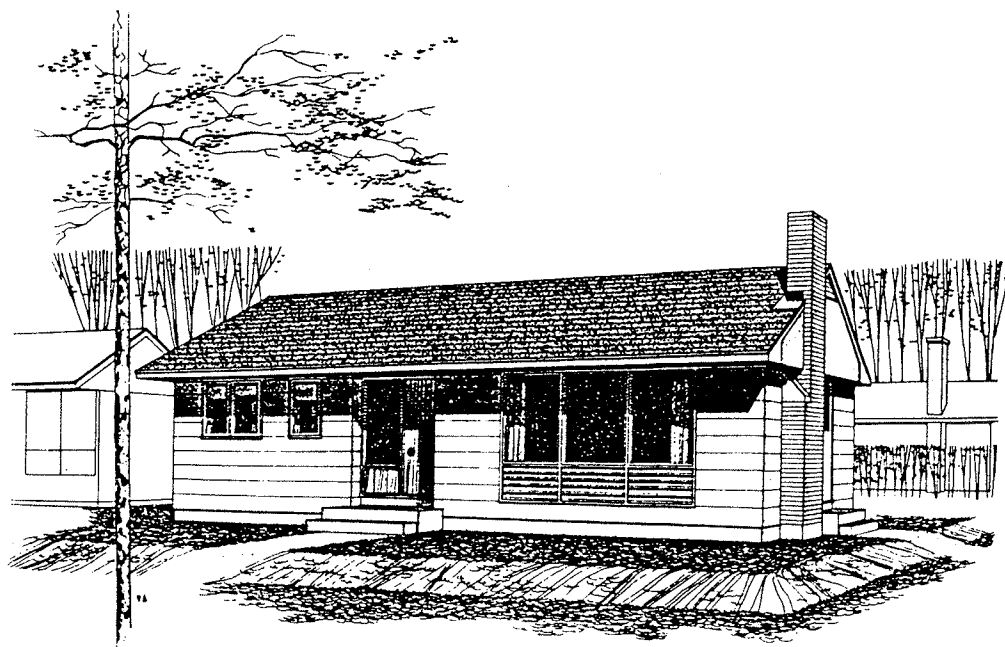
---

---

---

---

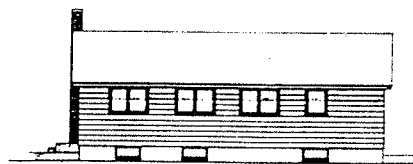




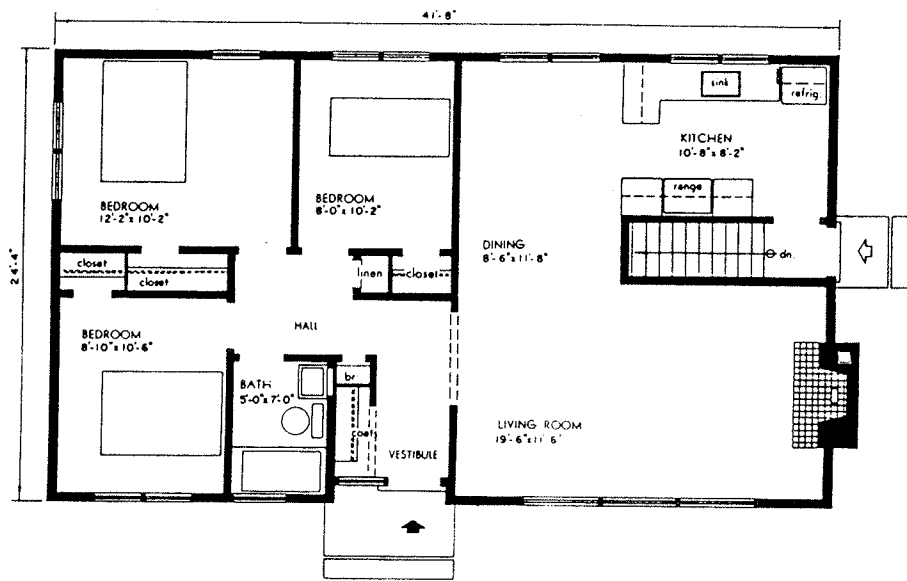
## Design 231

*Designed by:* CENTRAL MORTGAGE & HOUSING CORPORATION

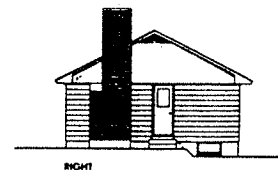
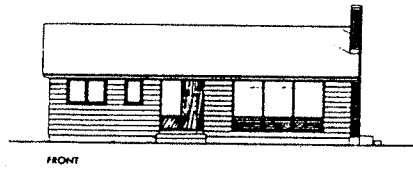
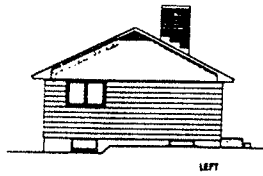
Kitchen, dining and living rooms are open to one another in this three bedroom bungalow. Laundry and heating are grouped in the basement around the stairs underneath the living room and kitchen areas so that the rest of the basement is quite clear to be partitioned as desired. The combined living-dining room with windows looking both to the garden and the street make each of these well defined rooms appear to be bigger than they are.



BACK



AREA: 1,013 square feet.



BIBLIOGRAPHY

Bowles, Roy T. Social Impact Assessment In Small Communities. Toronto: Butterworth & Co. (Canada) Ltd., 1981.

Bradford, George. Advance Estimating. Toronto: Advance Estimating Ltd., 1980.

Central Mortgage and Housing Corporation.  
Canadian Housing Statistics 1961. Ottawa: 1962  
Canadian Housing Statistics 1963. Ottawa: 1964  
Canadian Housing Statistics 1968. Ottawa: 1969  
Canadian Housing Statistics 1972. Ottawa: 1973  
Canadian Housing Statistics 1973. Ottawa: 1974

Housing in Canada 1946 - 1970, A Supplement to the 25th Annual Report of Central Mortgage and Housing Corporation. Small House Designs: Ottawa, 1958.

Collective Agreement Between Abitibi-Price Inc. (Thunder Bay Division) and Canadian Paperworkers Union, C.L.C. Local No. 134, May 1, 1982 to April 30, 1984.

Canadian Council on Social Development, A Review of Canadian Social Housing Policy. Ottawa: 1977.

Canadian Pulp and Paper Association, Human Resources Division. Wages and Earnings Data 1982. Montreal: 1983.

Carter, Novia Making Man's Environment - Housing. Scarborough, Ontario: Nelson Canada Limited, 1981.

Carver, Humphrey. Compassionate Landscape. Toronto: University of Toronto Press, 1975.

Chermayeff, Serge (Plunz, Richard ed.). Design And The Public Good: Selected Writings, 1930-1980 by Serge Chermayeff. Cambridge, Mass.: The MIT Press, 1982.

Dineen, Janice, The Trouble With Co-Ops. Toronto: Green Tree Publishing Co. Ltd., 1974.

Dodge Construction Systems Costs 1982. New York: McGraw-Hill Incorporated, 1982.

Engelsman, Coert. 1981 Residential Cost Manual - New Construction, Remodelling, and Valuation. New York: Van Nostrand Reinhold Company, 1981.

Fallis, G. Housing Programs and Income Distribution In Ontario. Toronto: Ontario Economic Council, University of Toronto Press, 1980.

Government of Ontario, Department of Treasury and Economics, Regional Development Branch. The Northwestern Ontario Regional Development Programme - A Progress Report. Toronto: Queen's Printer, 1969.

Grebler, Leo and Mittenback, Frank G. The Inflation of House Prices - Its Extent, Causes, and Consequences. Lexington, Mass.: Lexington Books, 1979.

Grigsby, William and Rosenberg, Louis. Urban Housing Policy. New Brunswick, N.J.: Center For Urban Policy Research, Rutgers University, 1975.

Labour Agreement Between Abitibi Power and Paper Co. Ltd., Thunder Bay Division and Pulp, Sulphite and Paper Mill Workers' Union, Local 134; May 1, 1962 - April 30th, 1963.

Labour Agreement Between Abitibi Forest Products, Thunder Bay Division and International Brotherhood of Pulp, Sulphite and Paper Mill Workers' Local No. 134, May 1, 1972 to April 30, 1973.

Laidlaw, Alexander F. Housing You Can Afford. Toronto: Green Tree Publishing Co. Ltd., 1974.

Leiss, William. The Limits to Satisfaction. Toronto: University of Toronto Press, 1976.

Lelen, Kenneth. "Build your own house - they'll teach you how at owner-builder schools". Popular Science, May 1983. pp 113-116.

Lucas, Rex A. Minetown, Milltown, Railtown - life in Canadian communities of single industry. Toronto: University of Toronto Press, 1971.

McClain, Janet, ed. Is Government Home Ownership Assistance The Way to Go? (Proceedings From a Symposium Held in Calgary, September 18-20, 1980.) Ottawa: Canadian Council on Social Development, 1981.

McLennan, Grant S., ed. Crisis In Urban Housing. New York: H. W. Wilson Company, 1974.

Morriss, Earl W., and Winter, Mary. Housing, Family and Society. New York: John Wiley and Sons Inc., 1978.

Ontario Welfare Council, Aspects of Northern Housing In Ontario. Toronto: 1975.

Pawley, Martin. Home Ownership. London: Architectural Press, 1978.

Pennance, Frederick; Hamilton, Stanley; and Baxter, David. Housing: Its Your Move; Volume 1 Final Report. (A Report prepared by a Study Team in the Urban Land Economics Division, Faculty of Commerce and Business Administration. Vancouver: University of British Columbia, 1976.

Rose, Albert. Canadian Housing Policies (1935 - 1980). Scarborough: Butterworth and Company (Canada) Limited, 1980.

Smith, Wallace F. Housing: The Social and Economic Elements. Berkeley, Ca.: University of California Press, 1971.

Statistics Canada. Census Divisions and Subdivisions: Selected Social and Economic Characteristics - Ontario. Ottawa: Ministry of Supply and Services, 1983.

Sternlieb, George. Housing Development and Municipal Costs. New Brunswick, New Jersey: Center for Urban Policy Research, Rutgers University.

Walker, Frank R., ed. Walker's Building Estimator's Reference Book, 21st edition. Chicago: Frank R. Walker Company, 1982.

Wenner, Marvin. Monthly Payments For Mortgages. Toronto: Computofacts, 1973.

Wheeler, Margaret, ed. The Right To Housing (Papers and Proceedings of the First "Canadian Conference on Housing" Held in Toronto (20-23 October, 1968 Under the Sponsorship of the Canadian Welfare Council). Montreal: Harvest House, 1969.