



# A HUMAN RESOURCES STUDY OF THE HOME BUILDING AND RENOVATING SECTOR IN NOVA SCOTIA Phases III and IV

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## Overview

### 1.0 Overview

The construction industry is an important contributor to the Nova Scotia economy. The overall industry employs 21,800 workers and accounts for more than 6.3% of provincial Gross Domestic Product.<sup>1</sup>

The construction industry is broadly divided into two sectors: residential and non-residential construction. Residential construction consists of single and multi-unit residential construction as well as renovation of existing housing. The residential sector is characterized by a large number of small businesses involved mostly in wood frame construction.

The non-residential construction sector includes all industrial, commercial and institutional (ICI) activities. This includes building construction (schools, shopping centres, saw mills, etc.) and engineering construction (bridges, pipelines, airports, etc.).

While the two sectors of the construction industry operate in different business environments and have different labour force requirements, the current statistical data, labour market information and educational programs treat construction as one homogeneous industry. There have been few systematic efforts to date to document the size, scope and impact of each component as a distinct sector. There has also been only limited documentation of the human resource requirements by sector.

The Atlantic Home Building & Renovation Sector Council (AHB&RSC) is an organization representing the interests of the residential construction industry interests with regard to human resource development. The AHB&RSC undertook a multi-phase provincial sector study in conjunction with Human Resources Development Canada (HRDC) to develop a comprehensive description of the residential new home building and renovation industry in Nova Scotia. This sector study is intended to provide the framework for human resource initiatives undertaken by the Sector Council.

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<sup>1</sup> Nova Scotia Department of Finance, Nova Scotia Statistical Review 2000.

## Objectives of the Sector Study

### 2.0 Objectives of the Sector Study

The intention of this sector study is to disaggregate information on the construction industry in Nova Scotia and provide an accurate picture of the residential sector. The concept for this study was developed by AHB&RSC, and research has been carried out in a phased approach.

Phase I and Phase II of this sector study were completed in March 2000. Phase I presents a profile of the home building and renovation sector, and its contribution to the economy. Phase II presents a profile of human resources in the sector.

Phase III and Phase IV were completed during the period from June 2000 to March 2001. The work is intended to build on the findings of the Phase I and II study and provide an analysis of this information in the context of the home building and renovation sector in Nova Scotia. It is also intended to report on the skills and training needs of the sector.

PRAXIS Research & Consulting was contracted to assist the AHB&RSC complete this sector study. The research team employed multiple lines of investigation, including:

- ▲ Review of literature and documentation on the construction industry in Nova Scotia;
- ▲ Analysis of available data related to employment, occupations and training in this sector in Nova Scotia;
- ▲ Analysis of industry trends;
- ▲ Meetings and interviews with industry representatives;
- ▲ Interviews with labour market and data experts within HRDC;
- ▲ Survey of employers in the sector;<sup>2</sup> and
- ▲ Focus groups with construction workers.

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2 See Appendix A for survey methodology, scope of questionnaires and sample frame.

# The Residential Construction Industry in Nova Scotia

## 3.0 The Residential Construction Industry in Nova Scotia

### 3.1 The Industry

Residential construction includes single-family homes, multiple units (rowhouse, duplex, semi-detached or walk-ups less than three-stories), and apartments less than three stories. The residential construction sector consists of two categories of firms: general contractors, who undertake the construction of entire structures; and trade contractors, who perform specialized services.

Overall responsibility for the project rests with the general contractor, also known as the new home builder and residential renovation contractor. The general contractor schedules the arrival of building products, material and machinery on the site, hires and co-ordinates the activity of employees and trade subcontractors, supervises construction, ensures that all building code and regulations are followed and handles client relations.

Renovation generally includes all the major processes involved in new construction. Some home-owners use personal resources to manage their properties and carry out repairs and maintenance. However, the complexity and costs of these tasks have increased in recent years and many home-owners now contract out these functions aimed at improving the appearance and performance of their properties.

The survey of firms involved in the residential construction sector found that many businesses undertake both new construction and renovation work. The following exhibit shows the percentage of firms reporting by type of construction and for firms indicating that activity, the average percentage of their total revenues they generate from that area of work.

**Exhibit 1: Construction Activities Undertaken by Survey Respondents**

CONSTRUCTION ACTIVITIES	RESPONDENTS INDICATING ACTIVITY UNDERTAKEN (N=100)	AVERAGE PERCENTAGE OF TOTAL REVENUES FROM ACTIVITY
New Home Construction	65%	51%
Renovations	92%	68%
Non-residential	11%	44%



Demographic factors, the amount of disposable income and the cost of consumer borrowing are the primary factors influencing residential construction activities.

### **3.2 The Employers**

Residential construction includes residential building and development companies and trade contracting companies. Trade contracting includes firms working solely in the non-residential sector, solely in the residential sector, and those operating in both. Estimates here are based on those operating primarily in the residential sector.

There are approximately 2,793 businesses operating in the residential construction industry employing over 13,000 Nova Scotians. This is comprised of 1,585 firms operating as residential building and development companies which employ 5,025 workers, and an estimated number of 1,207 trade contracting companies employing 8,070 people.<sup>3</sup> Further, the underground economy could account for an additional 10 to 25 percent of residential construction activities beyond what is captured in the official employment and expenditure data.<sup>4</sup>

The residential construction industry is composed primarily of small companies. Residential construction companies responding to the survey varied from one-person operations to companies with up to 25 employees. Most (90%) had less than 10 employees. 78% of employers expected employment levels within their firm to stay about the same over the next three years.

To limit their financial exposure during the off-season and during market downturns, firms operate with relatively low overheads and tend to expand and contract their operations (and enter and exit the industry) in a relatively fluid manner in response to changing market demands. The average number of employees per company during peak time was 6.2 in 2000, with the median number being 5 employees. Most operations (80%) experienced some fluctuation in employment levels in 2000. They employed on average 2.9 less workers during the off season.

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<sup>3</sup> See Appendix B for technical notes on this estimate.

<sup>4</sup> PRAXIS Research & Consulting, Human Resources Study for the Home Building and Renovating Sector, Phase I and II Report, March 2000, pp. 61-66.

### 3.3 The Labour Force

As reported above, there are some 13,000 Nova Scotians directly employed in the residential construction industry. Employers indicated that two-thirds of their work force were full-time employees.

In 1996, approximately 40% of the workers in this sector were under 35 and less than 10% were over 55 years of age, as shown in the following table. If we “aged” this data by five years to estimate the age mix today, we see only 15% of the 1996 labour force is now under 35 years old. We would expect new entrants to the sector during this period to belong to the younger age categories. However, it is not expected the new entrants would make up the difference of 25%.

Exhibit 2: Age Profile of Workers in Nova Scotia, 1996 Census

	RESIDENTIAL BUILDING AND DEVELOPMENT INDUSTRY (SIC 4010)	TRADES, TRANSPORT AND EQUIPMENT OPERATORS (MAJOR GP H, SOC 91)	ALL WORKERS IN NOVA SCOTIA
15-19 years	5%	4%	6%
20-24 years	10%	10%	11%
25-34 years	24%	28%	26%
35-44 years	30%	31%	28%
45-54 years	21%	20%	20%
55-64 years	9%	8%	8%
65 years and over	1%	1%	1%
TOTAL	100%	100%	100%

Workers in the construction industry tend to have lower education levels, with approximately 35% not having completed high school compared to 25% of the total labour force population in the Province without high school graduation. Workers with some college, technical and trades school training represent a larger portion of the sector (42 to 48%), however, only 5 to 7% have received a certificate or diploma for this training.



**Exhibit 3: Education Profile of Workers in Nova Scotia, 1996 Census**

	RESIDENTIAL BUILDING AND DEVELOPMENT INDUSTRY (SIC 4010)	TRADES, TRANSPORT AND EQUIPMENT OPERATORS (MAJOR GP H, SOC 91)	ALL WORKERS IN NOVA SCOTIA
Less Than Grade 9	8%	9%	5%
Some High School	27%	25%	20%
Graduated High School	9%	8%	11%
Non-University Education (trade, technical and college training)	37%	41%	29%
Trades Certificate or Diploma	5%	7%	4%
Some University	8%	7%	14%
Graduated University (Bachelor's Degree or Higher)	6%	3%	17%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

As noted earlier, the structure of the industry is such that employers expand and contract their operations in response to business and seasonal cycles. This produces a wide variation in the number of weeks worked per year in the residential construction industry. On average workers in the residential industry have 33.7 weeks of employment per year with average incomes of \$27,796.<sup>5</sup> The trends in employment patterns and capital expenditures suggest a seasonal fluctuation in the residential construction workforce of over 40% between peak and trough seasons.<sup>6</sup>

Because of the project nature of the employment, unemployment is considerably higher in the construction industry than other sectors of the economy. Even in boom times, workers tend to spend significant periods of time between jobs.<sup>7</sup>

5 PRAXIS Research & Consulting, Human Resources Study for the Home Building and Renovating Sector, Phase I and II Report, March 2000, p. 37 and p. 51.

6 PRAXIS Research & Consulting, Seasonal Dependency in the Residential Construction Sector in Nova Scotia, March 2001, p. 7.

7 Industry Canada, Sector Competitiveness Framework series – Construction, 1998.



Relations between workers and employers in the construction industry are much different than the more stable relationships that characterize most work situations. Trades people in the industry are generally hired on a project basis and change employers often. A growing trend in the construction industry is the contracting of work to self-employed individuals. In many cases, these self-employed individuals are dependent contractors in that they work for only one prime contractor. Dependent contractors have the same relationship with the general contractor in terms of supervision and control as an employer-employee relationship. The main difference is the sub-contractor is hired only for specific tasks, and has less income and job security than they would have as employees.

### **3.4 Outlook**

A significant shift in activity in residential construction appears likely over the next 15 to 20 years. New housing starts are expected to drop by a magnitude of one-third over the next fifteen years. The decline that has occurred in new home construction is not being felt on the renovation side. By contrast, the repair and renovation activity is growing each year, and this trend is expected to continue. Projections indicate the increase in spending on repairs and maintenance could more than offset decreases in new housing activities.<sup>8</sup>

Construction is often portrayed as a mature sector that is slow to innovate and resistant to technical change. In fact, technical change is beginning to have a significant impact on the skills required by both workers and management. New materials and methods of construction are being introduced, as are new methods of planning and organizing activities. As a consequence, the industry is faced with the challenge of upgrading its skill levels.

Employers in the residential sector indicate that they are facing shortages of skilled workers. This problem will continue to escalate as the rate of entry by young workers decreases and the older workers retire.<sup>9</sup>

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8 For a complete discussion, see PRAXIS Research & Consulting, Human Resources Study for the Home Building and Renovating Sector, Phase I and II Report, March 2000, pp. 66-71.

9 See for example, Atlantic Provinces Economic Council, Economic Trends in the Nova Scotia Construction Sector, June 1999, p.19.

## Occupations and Skills in the Residential Construction Sector

### 4.0 Occupations and Skills in the Residential Construction Sector

Documentation of the occupations involved in the sector and of the skills required for each occupation is the first step to developing a human resource strategy for the residential construction industry. HRDC, in association with knowledgeable consultants and industry participants, has produced a series of analyses of occupations over the past several decades, including numerous occupations related to construction. These National Occupational Analyses outline the set of tasks related to each occupation. The descriptions do not recognize the specific nature of the residential sector. The accurate description and understanding of residential construction occupations is essential to ensure appropriate skills training and career development.

Research to validate the occupational analyses to reflect the residential construction industry in Nova Scotia was undertaken by the AHB&RSC in 2000/01. Rather than to attempt to fit existing occupational analyses to the industry, the process began by defining the actual work activities involved in new home building and renovation. The work activities were grouped in categories, and are presented in the following table.



#### Exhibit 4: Categories of Work Activities in Residential Construction

WORK ACTIVITY
Financial, Company and Project Management
Design
Excavation
Foundation
Framing
Roofing
Siding
Plumbing
Ventilation & Forced Air Heat
Electrical
Insulation
Drywall
Finish Carpentry
Fireplace & Wood Stove Installation
Wall & Ceiling Finish
Floor Finish
Exterior Painting
Exterior Landscaping, Walkways, Driveway Paving

While some categories are areas of specialization where workers or trade contractors focus, often residential construction workers are required to perform work activities in many of the categories.

When considered from this perspective, traditional occupational analyses are less relevant. That is, the skills required will vary depending on the work activities in which the individual is involved. Review of the occupational analyses and discussion with industry representatives revealed that knowledge and skill requirements for work activities could be grouped in the following categories:

- ▲ Communications knowledge and skills (reading, writing, communicating effectively with others, etc.);
- ▲ Business management knowledge and skills (business planning, finances, human resources,



supervise projects, client relations, etc.);

- ▲ Health & Safety knowledge and skills;
- ▲ Work planning & site management knowledge and skills (plan, organize and schedule tasks, supervise site personnel, interpret plans, order proper materials, maintain proper tools and equipment, etc.);
- ▲ Tool & equipment knowledge and skills (use of hand tools, power tools, instruments and equipment relevant to the activity); and
- ▲ Work activity specific knowledge and skills (the required job-specific competencies to perform the activity).

While the levels of knowledge and skill required in each category for each work activity will vary, the main difference for all workers is in the work activity specific skills. This system of identifying the activities and skills of residential construction workers allows for the fact that some workers will continue to specialize and focus all their effort on a single activity, which may reflect traditional occupational descriptions, such as electricians or masons. It also allows for the clustering of work activities and the recognition of skills by activity rather than generic occupation titles. The AHB&RSC is currently completing an in-depth discussion with industry on occupational analyses in the residential construction industry.

#### **4.1 Work Activity Distribution**

The employers surveyed were asked to describe who performs various work activities on behalf of their firm. The response could be the activity was typically:

- ▲ completed by subcontractors;
- ▲ completed by the employer/owner;
- ▲ completed by employees of the firm; or
- ▲ not performed by the firm or subcontractor.



In the following exhibit, the answer provided by the majority of respondents is indicated.

**Exhibit 5: Who Performs the Work Activities**

WORK ACTIVITY	WHO DOES IT
Financial, Company and Project Management	Owner
Design	Not undertaken
Excavation	Subcontractor
Foundation	Subcontractor
Framing	Owner & Employee
Roofing	Owner & Employee
Siding	Owner & Employee
Plumbing	Subcontractor
Ventilation & Forced Air Heat	Subcontractor
Electrical	Subcontractor
Insulation	Subcontractor
Drywall	Owner & Employee
Finish carpentry	Owner & Employee
Fireplace & Wood Stove Installation	Subcontractor
Wall & Ceiling Finish	Owner & Employee
Floor Finish	Owner & Employee
Exterior painting	Owner & Employee
Exterior Landscaping, Walkways, Driveway Paving	Not undertaken

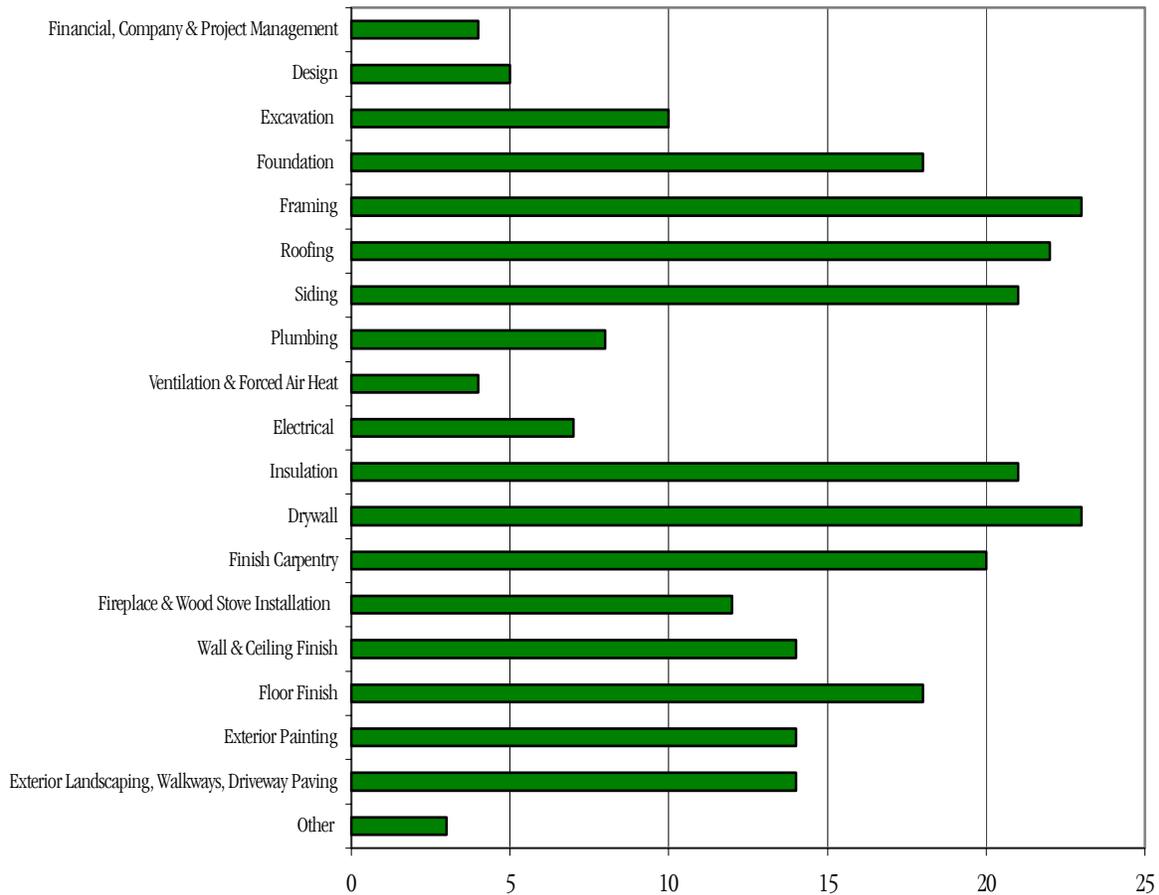
Subcontractors typically perform seven of the eighteen categories of activities listed above. Literature on the residential home building and renovation sector as well as opinions from key informants indicate that there is a shift in the operational structure of the industry toward contractors hiring fewer employees and subcontracting more work. 45% of the employers we surveyed expected to see the amount and type of work being sub-contracted to increase over the next five years.

Exhibit 5 also shows that owners are very involved in the hands-on operation of the work. It also suggests workers tend to work in numerous categories of activities. This is supported further by the



workshop held with thirty construction workers. The workshop participants indicated they performed a broad range of residential construction activities, with most participating in between 9 and 13 different categories of activities. Exhibit 6 shows the main categories of residential construction activities and the number of the thirty workshop participants that indicated they undertook each activity.

**Exhibit 6: Work Activities Undertaken by Workshop Participants**



## 4.2 Skills by Work Activity

For each of the main work activities, employers were asked to rate the importance of the categories of skills on a scale of 1 to 5. Average ratings ranged from 2.81 to 4.83. For ease of interpretation, the average ratings have been categorized as:

L = low range, from 2.81 thru 3.59

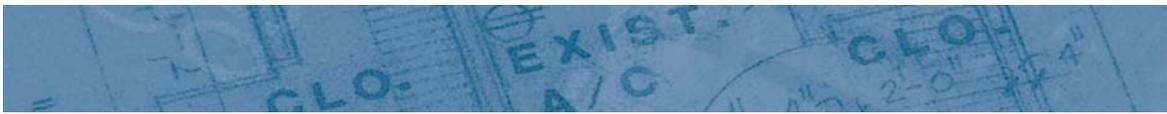
M = medium range, 3.60 thru 4.05

H = high range, 4.06 thru 4.83

**Exhibit 7: Importance of Skill Categories by Work Activity**

WORK ACTIVITIES	COMMUNICATIONS	BUSINESS MGT.	HEALTH & SAFETY	WORK PLANNING	TOOLS & EQUIP.	SPECIFIC SKILLS
Financial, Company & Project Management	H	H	L	H	L	M
Design	H	M	L	M	L	H
Excavation	M	L	H	M	M	M
Foundation	M	L	H	H	M	H
Framing	H	L	H	H	H	H
Roofing	M	L	H	H	H	H
Siding	M	L	H	M	H	H
Plumbing	M	L	L	H	M	H
Ventilation & Forced Air Heat	M	L	L	M	M	H
Electrical	M	L	L	H	M	H
Insulation	L	L	M	L	L	M
Drywall	L	L	M	M	H	M
Finish Carpentry	H	L	M	H	H	H
Fireplace & Wood Stove Installation	M	L	M	M	M	H
Wall & Ceiling Finish	M	L	M	M	H	H
Floor Finish	M	L	L	L	M	H
Exterior Painting	L	L	M	L	L	M
Exterior Landscaping, Walkways, Driveway Paving	L	L	L	M	L	M
OVERALL	MED	LOW	MED	MED	MED	HIGH

While business management skills were rated high for financial, company & project management and



design activities, it was rated as less important for all other work activities. Communications, health & safety, work planning and tool & equipment skill areas all rated medium importance. Work activity specific skills, or the required job-specific required competencies to perform the activity, rated as high importance overall.

We asked employers to rate the degree of change by work activity, where 1 meant no change at all and 5 was a great deal of change in the past 5 years. The following exhibit shows the average rating by work activity.

**Exhibit 8: Changes in Skills Needed by Work Activities**

WORK ACTIVITY	AVERAGE RATING OF CHANGE	MAIN REASON FOR CHANGE
Financial, Company and Project Management	2.6	Computers
Design	3.1	Computers and CAD programs Consumer demands
Excavation	1.7	Better equipment Larger and more complex homes
Foundation	2.3	ICF systems Styrofoam foundations
Framing	2.0	New materials such as engineered trusses
Roofing	1.9	New materials on the market
Siding	2.3	Rain screen principal Changing products
Plumbing	2.1	More in-floor heating Code changes
Ventilation & Forced Air Heat	2.9	NBC Air quality standards More complex systems
Electrical	1.7	More low voltage control systems
Insulation	1.7	R2000 requirements
Drywall	1.6	New products
Finish Carpentry	2.0	Changes in consumer style preferences
Fireplace & Wood Stove Installation	2.2	Changes in codes and safety standards Certification requirements New products



Wall & Ceiling Finish	1.9	New materials and finish techniques
Floor finish	2.4	Consumer preferences for more hardwood and ceramic New/better products
Exterior painting	1.7	Less painting done, more siding
Exterior Landscaping, Walkways, Driveway Paving	1.8	New products

Overall, it would appear the skills required for the categories of work activities in new home building and renovating have not changed a great deal in the past five years. While computers have significantly altered the management and design activities, most change in skill requirement is based on:

- ▲ New products and materials;
- ▲ Changes in building code and safety standards; and
- ▲ Changes in consumer preferences (larger, more complex houses, new styles of finish, etc.).

### 5.0 Training Issues

We asked survey respondents to rate their level of satisfaction with the skill levels of employees and sub-contractors. Employers were generally satisfied, with only a small number of respondents indicating any dissatisfaction. The areas with some dissatisfaction were framing, roofing and fireplace/wood stove installation.

In the following sections, the training by community college training, apprenticeship programs, industry and manufacturers is documented. In addition, information is provided on skilled worker shortages in residential construction. Finally, ratings on methods of training are summarized and major barriers to training for workers in the residential construction industry are discussed.

#### 5.1 Community College and University Training

The Nova Scotia Community College (NSCC) offers a wide range of apprenticeable courses and training related to the residential construction industry. The following 11 diploma and certificate programs are available in this field:

- ▲ Architectural Engineering Technician Diploma;
- ▲ Construction Administration Technology Diploma;
- ▲ Architectural Drafting Diploma;
- ▲ Electrical – Construction and Industrial Certificate and Diploma;
- ▲ Cabinet Carpentry Certificate;
- ▲ Carpentry Certificate;
- ▲ Gas Installation and Services Certificate;
- ▲ Heating, Ventilation, Air Conditioning/Refrigeration;
- ▲ Plumbing Certificate;
- ▲ Refrigeration and Air Conditioning; and



- ▲ Steamfitting/Pipefitting.

Within these certificate and diploma programs more than 100 related home renovation and construction related courses are taught throughout the 14 provincial campuses. Part-time and distance education courses are available as is a *Virtual Campus* program that allows the student to take courses via the internet according to their own schedule. Currently 36 courses are offered on-line through the Electrician, Gas Fitter III, and WHMIS programs while more certificate programs in this field are currently under development. Students may enroll in any program providing they meet the outlined prerequisites, and may attend courses providing they are available at local campuses.

Statistics on training courses completed were not available from the NSCC for this report.

Dalhousie University also offers construction-related training through its Continuing Technical Education division. Courses include:

- ▲ National Building Code;
- ▲ National Fire Code;
- ▲ Inspections for Building Codes and Fire Protection;
- ▲ Retrofit/Upgrading of existing Buildings;
- ▲ Project Management using Primavera;
- ▲ Concrete Repair;
- ▲ Water Quality Issues;
- ▲ Construction Contracting;
- ▲ Construction Law;
- ▲ Cost Estimating and Scheduling;
- ▲ Construction Renovation and Demolition;
- ▲ Roofing Maintenance;
- ▲ Project Management;



- ▲ Indoor Air Quality; and
- ▲ HVAC.

Courses typically average 20 attendees per session and are held two to three times per year in Halifax. This provides an estimate of over 500 completed training interventions each year through Dalhousie.

## 5.2 Apprenticeship Training

Apprenticeship is an agreement between an apprentice, an employer, and the Department of Education, Apprenticeship Training Division. The apprentice agrees to work for an employer for a specific length of time in exchange for extensive, supervised on-the-job skills training (practical) and technical training (theory). The term of apprenticeship is usually three to four years. Successful completion of the program earns a Certificate of Qualifications which recognizes the trades person as a skilled journeyman.

The Nova Scotia Apprenticeship Program actively participates in the Canadian Council of Directors of Apprenticeship, which administers the Interprovincial Red Seal Standards Program. The Red Seal Program provides mobility for certified trades people to work in other provinces and territories of Canada without having to write further examinations.

### 5.2.1 Designated Trades and Terms

There are 52 officially designated trades in Nova Scotia. Of these, at least 16 can be argued to have some level of involvement in the residential building and renovation industry although no data exists to gauge apprenticeship by construction sector (see the following table). Only seven of these trades have apprenticeship training programs in place in this province, the most recent addition being training for gas fitters in 1999.<sup>10</sup>

Each designated trade has a specific number of hours that must be completed in order to qualify for a

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10 Note that although apprenticeship training is not available for these other trades, certificates can still be issued to individuals in this province based on work or other training experience.



Certificate of Completion. One year of training is recognized as 2,000 hours. The requirements to qualify for a Certificate range from 4,000 to 8,000 hours, depending on the regulations governing that particular trade.

**Exhibit 9: Apprenticeship (Available and Not Available in NS)**

TRADE NAME	YEARS
Apprenticeship Training Available:	
* Bricklayer ✓	4
* Construction Electrician ✓	4
* Oil Burner Mechanic ✓	3
* Plumber ✓	4
* Refrigeration & Air Conditioning Mechanic ✓	4
* Carpenter	4
Gas Fitter	2
Apprenticeship Training currently Not Available:	
* Cabinet Maker	4
* Cement Finisher	3
* Floorcovering Installer	2.5
* Glazier (works with glass)	4
* Insulator (heat & frost)	4
* Lather (drywall, vapour barriers, etc.)	3
* Painter and Decorator	3
Restoration Stone Mason	4
* Roofer	3

\* Indicates a Red Seal Occupation.

✓ Indicates that certification is compulsory. This means that any person working in this trade must hold a current Certificate of Qualification, be a registered apprentice or an improver, have a current temporary permit, or have a current Certificate of Qualification bearing the Red Seal. Trades are specified on the request of industry and this request is generally based on reasons of public and worker safety.

Individuals must first be employed in the trade before they can register as an apprentice. To register an individual should have successfully completed Grade XII, or an acceptable equivalent of education and experience.

The Apprenticeship Training Division has two main partners: the Nova Scotia Community College (NSCC) and the University College of Cape Breton (UCCB). A virtual NSCC campus is also offered out of Halifax. UCCB does not currently offer apprenticeship training for any of the trades listed in the earlier table.

### 5.2.2 Program Participants

Registrations have increased considerably over time, up 46% over the three-year period shown in the following table. The construction electrician trade has consistently attracted more new apprentices than most of the other trades.

**Exhibit 10: New Registration Statistics**

YEAR	# NEW APPRENTICES	CANCELLATIONS & REINSTATEMENTS	% CHANGE FROM PREVIOUS YEAR	% BY TRADE
1997/98	824	514 were cancelled for various reasons <sup>11</sup> 25 reinstatements	13% higher than 1996/97	Construction Electricians (14%) Carpenters (10%) All others at 6% or less
1998/99	932	470 were cancelled 34 reinstatements	13% higher than the previous year	Construction Electricians (12%) Carpenters (7%) Plumbers (7%) All others at 6% or less
1999/00	1,212	312 cancelled 18 reinstatements	30% higher than the previous year	Construction Electricians (14%) Carpenters (9%) Plumbers (8%)

*Source: Annual Reports for 1997/98, 1998/99 and 1999/00. New Registrations by each trade were not provided in the Annual Reports.*

The number of apprentices who have graduated from the Apprenticeship Program as journeypersons associated with residential construction and renovation has increased over time but remained constant over the past two years. Plumbers and construction electricians accounted for 61% of the new journeypersons versus only 25% in the previous year. Note that there have not yet been any graduations from the Gas Fitter Program.

<sup>11</sup> Examples include 'leaving the province', 'at own request', 'to write the Certificate' and 'not trade employed'.



### Exhibit 11: Apprenticeship Active and Completions

TRADE NAME	1997/98	1998/99	1999/00	# ACTIVE*
Bricklayer	-	5	1	37
Carpenter	19	28	17	429
Construction Electrician	25	41	71	642
Gas Fitter	-	-	-	10
Oil Burner Mechanic	23	26	18	133
Plumber	19	42	27	282
Refrigeration and Air Conditioning Mechanic	16	13	21	88
<b>SUB-TOTAL</b>	<b>102</b>	<b>155</b>	<b>155</b>	<b>1,621</b>
Other Non-Residential Construction Related	164	189	261	2,461
<b>TOTAL</b>	<b>266</b>	<b>344</b>	<b>416</b>	<b>4,082</b>

\* As of January 30, 2001 and indicative of all individuals who have registered in the Program, regardless of whether they accessed training or not.

As of January 30, 2001 there were 4,082 apprentices considered active in the province.<sup>12</sup> Nearly 44% (1,621) were involved in trades related to residential building and renovation. Of these, 1,310 have completed at least one full year of their program:

- 398 have completed the first year of training
- 321 have completed the second year
- 300 have completed the third year
- 291 have completed the fourth year.

## 5.3 Industry Training

The AHB&RSC, formerly the Atlantic Home Building & Renovation Regional Industry Training Council (RITC), is a significant intermediary in the co-ordination and delivery of training to the

<sup>12</sup> These data do not include improvers (these are individuals who have some training or experience and therefore do not require the full scope of apprenticeship training) and Section 19 applicants (non-apprentices approved to write certification examinations).

residential construction workers. Over the period 1991 to 1999, AHBR RITC industry training courses attracted 1,997 participants who received on average 98 hours of training. The courses ranged in duration from 16 hours for Builder Workshops to as many as 280 hours for the Building Analysis Training. The AHPS Atlantic Housing Professional Studies and Energy Efficient Renovation courses were the most popular, accounting for nearly 40% (431 and 349 respectively) of the participants.

**Exhibit 12: Industry Training Courses by Title, 1991-1999**

COURSE TITLE	DURATION (HRS)	TOTAL PARTICIPANTS
AHPS Atlantic Housing Professional Studies	80/56	431
BAT Building Analysis Training	240/280	134
BAT Intro/Ext Building Analysis Training - Introduction / Extension	80/120	46
BBH Better Built House	45	137
BSALC Building Science/Air Leakage Control	80	54
BTWS Builder Workshops	16	0
EERT Energy Efficient Renovation	240	349
Energy Efficient Renovation - Introduction	80	16
CCSE Computerized Construction Software	80	69
CC&E Computerized Costing & Estimating	80	34
MOIS Moisture in Atlantic Housing	8	30
NBC National Building Code - Part 9	40	265
RENO Renovation Management	48	22
R-2000 & Update	24	0
SACT Simply Accounting in Construction	48/32	22
Site Supervision	48	95
Trainers - NSCC	40	1
Other Academic (financial, business, marketing, management, etc.)	Not avail.	292
<b>TOTAL</b>		<b>1,997</b>

As shown in Exhibit 13, there was broad access to training across the province. Courses in Halifax Regional Municipality and Sydney attracted 61% of the participants over the period (1,218 out of 1,997) and accounted for 51% of the total training hours (100,787 out of 195,749).



**Exhibit 13: Industry Training Courses by Location, 1991-1999**

LOCATION	PARTICIPANTS	TOTAL HOURS
Amherst	42	9,160
Bridgewater	37	3,852
Eskasoni	69	10,960
HRM	937	77,732
Kentville	220	19,844
Middleton	23	5,520
New Glasgow	132	13,734
Port Hawkesbury	33	7,920
Sydney	281	23,055
Truro	51	5,892
Yarmouth	172	18,080
<b>TOTAL</b>	<b>1,997</b>	<b>195,749</b>

The number of training participants has remained fairly consistent over the last five years shown in the table, ranging from a high of 313 in 1994 to a low of 245 in 1998. Winter sessions, typically the best time for builder and renovator training, accounted for 69% of the participants.

**Exhibit 14: Industry Training Courses by Year, 1991-1999**

SESSION	YEAR UNSPECIFIED	1991	1992	1993	1994	1995	1996	1997	1998	TOTAL
Winter	N/A	-	80	169	196	230	262	211	232	1,380
Spring	N/A	-	-	-	37	-	-	49	13	99
Fall	N/A	20	23	14	80	72	17	-	-	226
<b>TOTAL</b>	<b>292</b>	<b>20</b>	<b>103</b>	<b>183</b>	<b>313</b>	<b>302</b>	<b>279</b>	<b>260</b>	<b>245</b>	<b>1,997</b>
	15%	1%	5%	9%	16%	15%	14%	13%	12%	

Courses delivered in 1991-1993 were offered at no charge to all participants. A \$25 fee was imposed for 1994-1995 courses. This fee increased to \$100.00 over the 1995 and 1996 seasons. EI recipients paid \$125/course in 1996-1998. Since that time, courses have been delivered on a cost-recovery basis.



## 5.4 Manufacturer and Supplier Training

Another form of training is that delivered to by the manufacturers and suppliers. Manufacturers offer information and training sessions, particularly in conjunction with new product releases. This training is targeted to suppliers and builders. Suppliers also offer training to builders and the public, passing on manufacturer training or providing value-added information and techniques. Unfortunately, there has been no tracking of the extent and reach of this type of training.

Manufacturer-specific training includes both short and longer duration courses. For example, Kent Building Supplies provided training for industry and the public on items such as windows, doors, flooring, power tools, roofing, insulation, lumber and other building products in 2000.

Details on the range of manufacturer and supplier training occurring and on the level of participation by the residential construction industry in this type of training has not been documented to date.

## 5.5 Skilled Worker Shortage in Residential Construction

In a 1999 Statistics Canada survey, 68% of respondents identified a shortage of skilled workers as a main obstacle for the residential building industry.<sup>13</sup> Similarly, 60% of the employers we surveyed felt the residential construction industry in Nova Scotia is facing a shortage of skilled labour. When asked what they thought the reasons for the labour shortage were, employers provided the following responses:

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13 Dr. Frances Anderson and Susan Schaan, Innovation, Advanced Technologies and Practices in the Construction and Related Industries, 1999, Science, Innovation and Electronic Division of Statistics Canada.



**Exhibit 15: Reasons for Shortage of Skilled Labour**

REASON	PERCENT
Employees and youth going to other sectors like technology; lack of encouragement to enter this trade; higher wages elsewhere; seen as a lower paying profession	41%
Lack of appropriate training; cutbacks or lack of funding in schools	21%
Not enough human resources in the work force that meet the criteria; not enough youth	11%
Lack of interest	7%
There is only seasonal work, no full-time; shortage of stable employment	6%
Government should subsidize training	6%
Employees (particularly youth) don't want to work; youth want time off and easier jobs	4%
Other	4%
<b>TOTAL</b>	<b>100%</b>

The following table shows the percentage of employers surveyed who believed there were skilled labour shortages by specific work activities. 83% believe there is a shortage of workers for finish carpentry, followed by plumbing (70%), drywall (52%), framing (52%) and roofing (48%).

**Exhibit 16: Percent of Employers Indicating Labour Shortages by Work Activity**

WORK ACTIVITY	PERCENT
Financial, Company and Project Management	13%
Design	9%
Excavation	13%
Foundation	17%
Framing	52%
Roofing	48%
Siding	39%
Plumbing	70%
Ventilation & Forced Air Heat	35%
Electrical	39%
Insulation	13%
Drywall	52%
Finish Carpentry	83%



Fireplace & Wood Stove Installation	30%
Wall & Ceiling Finish	30%
Floor Finish	39%
Exterior Painting	22%
Exterior Landscaping, Walkways, Driveway Paving	17%

## 5.6 Methods of Training

Employers were asked to rate the effectiveness of various training methods for workers in the residential construction sector on a scale of 1 to 5. Average ratings ranged from a low of 1.9 for correspondence based training to a high of 4.4 for on-the-job training.

**Exhibit 17: Ranking of Training Methods**

TRAINING METHOD	AVERAGE RATING
On-the-job training	4.4
Combination of classroom and on-the-job training	4.2
Formalized Apprenticeship Training Program	3.7
Training by external experts	3.6
Training by manufacturers	3.1
Classroom training	3.1
Training by suppliers	3.0
Computer-based training	2.2
Multi-media interactive internet based training	2.1
Correspondence	1.9

## 5.7 Barriers to Training

When asked specifically what barriers prevent workers from taking training, employers most frequently mention the lack of a career path in the industry to make training an asset, and the cost of training in terms of both the actual course costs and the loss of income while on training programs.



**Exhibit 18: Reasons Why Workers Don't Take Training**

REASON	PERCENT
Lack of a career path in residential construction	20%
Cost of training and lack of financial support while on training	19%
No training available in local area	14%
Lack of a pay-off (no increase in salary, etc.)	11%
Need support for on the job training and taking on apprenticeships	8%
Poor quality training program and/or instructors	8%
Lack of time to take courses	7%
Lack of awareness/information on available training	3%
Prerequisite education levels too high	2%
Other (answers given by less than 2% of respondents)	8%

## Innovations and Trends in the Residential Construction Sector

### 6.0 Innovations and Trends in the Residential Construction Sector

New and emerging innovations and trends in the new home building and renovation sector have the potential to impact on the skill requirements of workers in this industry. There has been no detailed study of this issue in Nova Scotia. As such, this section is based on a review of relevant studies and discussions with a wide range of industry experts. It provides an overview of innovations and trends in the Canadian new home building and renovation industry with references to Nova Scotia, where applicable.

There is often a lag effect between introduction and widespread adoption of construction innovation. Consumer preferences, the regulatory environment, the cost of new technologies and the availability of skilled labour can act as impediments to adoption. One contact remarked it may take as long as two to three years for the Nova Scotia industry to adopt innovations developed in larger markets such as in Ontario.<sup>14</sup>

For the purpose of this discussion, innovations and trends are divided into three main categories. These are:

- ▲ Physical (type of dwelling, design materials, methods and tools);
- ▲ Regulatory (Occupational Health and Safety, Workers Compensation and building codes,); and
- ▲ Other (certification, professionalism, and home warranties).

#### 6.1 Physical Trends

The 1998 CMHC study, *Renovators and Technological Change in the Single Family Housing Market in Canada, 1990-2005*, highlighted that technological change in the industry is occurring in new materials, methods and equipment being used. This is especially true in the use of electronic components in the mechanical and electrical fields and in the use of prefabricated and man-made components. The report suggests there will be an increasing need for workers to be computer literate and knowledgeable about the building as an integrated system.

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<sup>14</sup> Source: Andrew Holley, Planning and Control Manager, Cresco Homes, Bedford, Nova Scotia.



According to the study, the main trends in the types of technology being used by renovators are:

- ▲ Heating, ventilation and air-conditioning products (such as furnaces, air exchangers and heat exchangers);
- ▲ Energy efficient products, particularly windows (windows, doors, building wraps and insulation); and
- ▲ Engineered and man-made wood products (for structural purposes, flooring, framing, cabinets and finish carpentry).

The most significant technologies fall under the areas of:

- ▲ Materials: Low contaminant-emitting architectural building products, pre-fabricated lightweight concrete panels and mortar-less blocks.
- ▲ Tools: Articulating and telescoping boom tools, fall arrest systems and automated inspection systems.
- ▲ Methods: Computer-based training systems, computer simulation of construction projects, field joining methods for modular, factory-built exterior wall panels.
- ▲ Design: Minimum energy use house design, modular mechanical systems, integrated residential space, water heating and ventilation systems.

New technologies by trade include:

- ▲ Sheet metal worker: Computer-based training systems;
- ▲ Electrician: Automated buildings;
- ▲ Carpenter: Prefab door jamb/molding combinations;
- ▲ Insulator: Minimum energy use house design;
- ▲ Bricklayer: Mortar-less blocks;
- ▲ Cement Mason: Self-leveling concrete floors;



- ▲ Plasterer: New product to eliminate taping of drywall joints;
- ▲ Painter: Low contaminant-emitting architectural building products;
- ▲ Roofer: Single-ply roof membranes;
- ▲ Plumber: Computer-based training systems; and
- ▲ Sprinkler Fitter: Computer-based training systems.

The most significant challenges are expected to come from technologies involving electronic control systems and computers. This technology requires advanced training in theory and practice, especially on the service and repair side. It is also subject to very rapid change. Other major challenges will come in balancing out the science and technology of moisture control, indoor air quality, energy conservation and consumer economics when doing major renovations and additions.

A recently published Statistics Canada survey of 1,800 prime and trade contractors found many of the advanced technologies being used by residential builders, or planned for use, are computer related (email, networks, design software, etc.).<sup>15</sup> The results of the survey suggested the residential building industry had the highest percentage of all construction businesses indicating that a shortage of skilled workers is an issue to using new and improved building products.

Discussions with industry experts identified the following new technologies and trends as well as the implication on skills requirements:

- ▲ Smart houses (security, computer, phone, theatre, climate control, etc.) and the need for qualified wiring technicians. Fibre optic cabling is a promising new technology.<sup>16</sup> The design and installation of the cabling requires very specialized skills. Currently, these trades persons are in high demand and in short supply.
- ▲ Advanced integrated mechanical systems currently being tested on two test homes by the National Research Council. These systems integrate space heating, domestic water, etc. all in one box. This system is a potential labour saver but increases the skill requirements for installation and

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<sup>15</sup> Source: Survey of Innovation, Advanced Technologies and Practices in the Construction and Related Industries, Statistics Canada, January 2001.

<sup>16</sup> Source: Luc Saint-Martin, Business Manager, Canadian Centre for Housing Technology, National Research Council of Canada, Ottawa.



maintenance.

- ▲ Steel studs, ICF (insulated concrete forms) and pre-wired homes are gaining in use here in Canada. The use of more costly steel studs requires more advanced skills from builders in terms of installation. ICF and one-pour systems reduce labour costs but require greater skills from builders.<sup>17</sup>
- ▲ A representative of the Home Depot suggested the retail industry is seeing steady growth in the do-it-yourself market.<sup>18</sup> New composites are now being used such as steel studs and plastic decking. With this comes new equipment designed to simplify the installation process.

The website of the Canadian Home Builders Association highlights a number of home renovation trends that include:

- ▲ Multi-generational housing as younger generations stay at home longer and aging generation moving back in with family;
- ▲ Accessible housing (e.g. wide doorways and halls, grab-bars in bathrooms, non-skid flooring, etc.);
- ▲ The home office (acoustical insulation, pre-wiring, built-in workstations, shelving, lots of natural light);
- ▲ Home entertainment centres;
- ▲ Energy retrofitting (insulation, windows, heating systems, appliances, lighting, etc.);
- ▲ Healthy indoor air; and
- ▲ Home security.

Not all advances in materials and design require significantly new skill sets for builders. For example, some trades continue to use standard installation procedures, albeit with better construction materials. For example, installing windows has not changed significantly yet advanced low-emissivity glazed windows are now commonly used in both replacement and new building construction. In keeping with this, a representative of one Nova Scotia residential construction company suggested few new

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17 Source: David Henderson, Ontario Home Builders Association.

18 Source: David Day, Head of Marketing for Home Depot, Toronto.



technologies have made their way into this region in recent years.<sup>19</sup> One of the most recent new materials, extruded polystyrene for the exterior of the home, was introduced here approximately eight years ago. This system requires that builders understand proper bracing techniques.

The survey of employers identified several trends in the areas of quality and the amount of available work and skilled labour. Their comments were as follows:

- ▲ *Quality*: Homeowners are more knowledgeable and are setting higher standards. There is too much emphasis on health & safety. Workers no longer have pride in their work due to the very tight budget they have to work by. Poor workmanship is pushing the homeowner to do his own work. A lot of people are "do-it-yourselfers". There have been rapid price increases in materials forcing people to think twice about doing work or building.
- ▲ *Amount of Work*: Offshore work is employing many carpenters (leaving more work for the rest of us). HST taxes have hurt a lot and have increased the amount of cash jobs. Big builders are pushing down labour prices to build a cheaper house.
- ▲ *Availability of Skilled Labour*: The largest problem we face today is the lack of experienced trades people in all categories. Low wages and poor job security in a seasonal industry with insufficient employment insurance (EI) is fuelling the labour shortage.

There have not been any major shifts in the types of residential dwellings being constructed in Nova Scotia. Consumers are, however, becoming more sophisticated in their knowledge of building materials and designs. A recent article of Ontario Home Builder Magazine suggests architects, interior designers and builders are encountering a pro-active consumer interested in start-to-finish involvement. The average client has access to concepts and images that draw on international ideas and resources. The Internet facilitates and empowers the consumer, and it is critical for builders to keep current on new technologies and materials.<sup>20</sup>

## 6.2 Regulatory Trends

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19 Source: Andrew Holley, Cresco Homes, Bedford, Nova Scotia.

20 Homes for the 21st Century, Ontario Home Builder Magazine, Summer 2000.



The regulatory and business climate has an impact on skill requirements in the residential construction and renovation industry.

### **6.2.1 Occupational Health and Safety**

Nova Scotia's Occupational Health and Safety Act was introduced in 1996 for the administration and enforcement of occupational safety and health in the Province. The Act places certain duties on employers, employees, self-employed persons and contractors. Utilizing a set of regulations and Codes of Practice, the Act dictates who is responsible for health and safety issues at job sites, and provides direction on acceptable health and safety procedures and equipment. The implication is that employers must ensure that safe procedures are followed at the jobsite at all times, generally with the employer bearing the burden of responsibility. They must further ensure all personnel have the appropriate training. Given this, employers are increasingly looking for employees with sufficient health and safety training.

### **6.2.2 Workers' Compensation**

Changes to the Workers' Compensation Act have affected the activities of residential construction and renovation companies in terms of hiring and staffing practices. Employers in mandatory industries must register with the Workers' Compensation Board (WCB). Under the Act, the WCB collects premiums from all employers to cover workers' compensation insurance. However, employers are not permitted to reduce their workers' remuneration to pay for their workers' compensation coverage. Since January 2000, employers are still responsible for employees and sub-contracting firms with less than three employees but they are no longer allowed to deduct premiums from non-mandatory, non-registered sub-contractors (firms with less than three employees). This change in the legislation has forced many employers to expect WCB registration from non-mandatory sub-contractors in order to help preserve and protect their experience rating, one determinant of their premiums. Given this, there has been a sharp increase in the number of registrations in the province, mainly from non-mandatory businesses in order for them to continue working relationships with larger companies. At the same time, our survey provided anecdotal evidence to suggest some residential



construction companies have split larger companies into smaller units in order to avoid mandatory WCB registration.

### **6.2.3 National Building Code System**

An objective-based National Building Code system is being developed in Canada. The Code is being designed to make the codes clearer and, therefore, easier to apply in a consistent manner. This change is expected to facilitate faster introduction of housing innovations into the marketplace by allowing builders to determine whether a new product or technique will satisfy the codes. This will likely have an impact on skill requirements and training needs, as builders look to innovative designs, methods and materials.

## **6.3 Other Trends Impacting Human Resource Planning in Residential Construction**

### **6.3.1 Certification**

Both large and small builders are pursuing certification. A Certified Residential Builder (CRB) is a builder or renovator that has met the high standards and requirements of the Nova Scotia Home Builder's Association *Professional Builder's Certification Program*. To date, there are about thirty CRBs in Nova Scotia. Members are required to complete specific technical, safety and business management courses and must fulfil a series of other requirements. These include employing at least one Certified Housing Professional with a minimum of three years of experience. They must also carry public liability insurance and be in good standing with the Workers Compensation Board.

### **6.3.2 Professionalization**

The Atlantic Home Building and Renovation Sector Council, the Atlantic Home Builders' Training Board, the Nova Scotia Home Builders' Association and the Atlantic Home Warranty Program are currently exploring the feasibility of establishing a program of professionalism in Nova Scotia. Through the program, a licensing model would be established whereby new home builders and



renovators would become licensed practitioners. Through this initiative, the builders and renovators would be required to demonstrate various levels of competency in their trades.

The survey of employers found 74% of respondents either support or fully support an industry-driven licensing or certification program. Of these respondents, nearly 40% fully supported the notion.

### **6.3.3 Warranties**

Third party warranties have been established to protect consumers when purchasing a new home. To date, Atlantic Canadians have two warranty options. One such program, the Atlantic Home Warranty Program, was established in 1976 as a non-profit company of Atlantic home builders. Members of the program originally offered clients a five-year limited home warranty that has since been expanded to seven years. Recently, the additional option of a ten-year program was introduced. Builders become registered members, following a series of entrance requirements including strict monitoring of their building process and attendance at training sessions. To date, the program boasts a membership of nearly 800 members across the four provinces, with the number of warranties totalling 2-3,000 at any given time<sup>21</sup>.

The for-profit company, the Residential Warranty Corporation of Canada, also offers warranties on new homes. To date there are approximately 200 members in Atlantic Canada. A representative of the corporation suggested that Atlantic Canada is considerably more behind in its thinking on warranties relative to other provinces but that this mindset is changing<sup>22</sup>. For example, warranties are still optional in this Region, versus British Columbia, where building permits are not approved unless warranties are in place. Typically, most homeowner complaints are related to poor workmanship rather than building code defects. Growth in the warranty industry will require both better coverage and increased demands on builder performance.

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21 Source: John Healey, Warranty Services Manager, Atlantic Home Warranty Program, Halifax

22 Source: Greg Cormier, Manager, Residential Warranty Corporation of Canada, Moncton, New Brunswick.

## Concluding Comments

### 7.0 Concluding Comments

This sector study set out to describe the composition and operation of the residential construction sector in Nova Scotia. This provides a basis for the analysis human resource requirements of this sector, distinct from those of the construction industry as a whole.

With approximately 2,793 business employing over 13,000 Nova Scotians, the residential construction sector is an important contributor to the economy of the province. Businesses are primarily small companies and are based in virtually every community across Nova Scotia. In addition, the underground economy operating in this sector could account for more than a quarter of all activity.

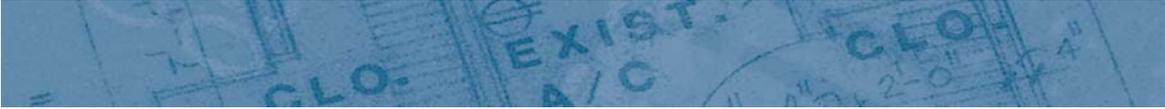
The housing projection models predict a shift in the residential construction activity over the near-term, with new home construction expected to slow but renovation activity to continue to expand. There is some debate whether these models accurately reflect the reality that is being observed in Nova Scotia.

The groundwork laid by this sector study in terms of occupations and skills assessment has already been instrumental in moving the sector forward in the development of a competency-based assessment model. This model will focus on work activity and skill requirements rather than on the traditional occupational analyses. The AHB&RSC will continue this work in the upcoming year.

The research points to a concern there is a growing shortage of skilled workers in the sector. This problem exists despite the availability of training from community college, university, industry groups, manufacturers and suppliers, as well as an extensive apprenticeship system. The issue points to a lack of fit between some of the training and industry-desired skills, but more significantly, it points to the fact the construction industry is not viewed as a career of first choice for new entrants.

To address the first issue, an assessment of the current training offering could help identify gaps as well as particular areas where training provided does not match industry skill requirements.

The second issue is more difficult to address. Rather than blaming youth for their lack of interest, the industry must consider ways to enhance working conditions, wage rates and career paths to be competitive with other sectors and to ensure they have a skilled workforce in the future. The AHB&RSC are contributing to this solution by spearheading a professionalization model, one goal of which is to



ensure a career development path for individuals and to raise the image of workers in the sector.

Immigration is an additional factor that could have implications on the residential sector, but was beyond the scope of this study. Immigration could add two dynamics to the outlook: it may increase demand for new housing stock, and could be a source of additional skilled labour.

In conclusion, this study provides a strong framework for planning and implementing human resource development initiatives in the residential construction sector. Further research in the following areas could serve to strengthen this framework:

- ▲ Investigation of the size and scope of the underground economy in the residential construction sector and the implications of this on human resource planning and development;
- ▲ Review of current housing forecast models commonly cited in Nova Scotia to ensure they reflect observed trends, and possibly develop a more comprehensive model;
- ▲ Assess the current training offering in the province to identify gaps as well as particular areas where training provided does not match industry skill requirements; and
- ▲ Investigate the impact of increasing immigration into Nova Scotia in terms of housing demand and potential to alleviate the immediate shortage of skilled workers.

## Appendix A: Description of the Employer Survey

### Appendix A: Description of the Employer Survey

A survey was designed to solicit data and insights from employers in the residential construction industry in Nova Scotia. The survey was designed in two phases, with the first phase conducted as a 7 minute telephone interview and the second phase involved respondents completing hard copy questionnaire which was faxed or mailed back. The purpose of the initial survey was to determine:

- ▲ the general work activities undertaken;
- ▲ the size of the firm and fluctuations in employment;
- ▲ trends in sub-contracting;
- ▲ opinions on the extent and causes of skilled labour shortages;
- ▲ opinions on the effectiveness of various methods of training and the barriers to training; and,
- ▲ industry support for licensing or certification system.

The purpose of the second follow-up survey was to gather detailed information on the skill requirements by work activity. Specifically:

- ▲ importance of skill categories by work activity;
- ▲ the most important “Work Activity Specific” skill or competency;
- ▲ changes in skills by work activity;
- ▲ work activities facing skilled labour shortages; and,
- ▲ trends in the sector, including employment levels.

HRDC Labour Market Information division provided a database of employers in the Standard Industry Codes 4011 Single Family Housing, 4012 Apartment and Other Multiple Housing, and 4013 Residential Renovation. The database contained listings for 456 firms, and the phase 1 telephone survey was completed with 100 of these. All completed interviews from phase 1 were asked if they would participate in a second phase involving a faxed/mailed/mailed survey to be completed and returned. 85 of the 100 respondents indicated they would, and after a two-week cut off, 23 completed phase 2 surveys had been returned.

## Appendix B: Technical Notes

### Appendix B: Technical Notes

Residential construction includes businesses categorized as residential building and development, as well as trade contracting firms. Trade contracting includes those working solely in non-residential, solely in residential, and those operating in both. The challenge is to determine with some confidence the portion of activities undertaken by trade contractors in the residential sector alone.

In general terms, 51% of total capital expenditure in the construction industry in Nova Scotia is in the residential sector, with the remaining 49% being non-residential.<sup>23</sup> Construction accounts for approximately \$1,802 million of provincial GDP, with residential construction comprising 58% and non-residential 42%.<sup>24</sup> An Ontario study notes that the breakdown of total employment in the construction sector is approximately 60% residential and 40% non-residential.<sup>25</sup> Additionally, we know that 32% of the contracting trades are unionized in Nova Scotia.<sup>26</sup>

With this data, as well as findings from the Canadian Home Builders Association on the incidence of sub-contracting in Atlantic Canada and industry expert opinions, we estimate that trade contracting in Nova Scotia is likely split fairly evenly between residential and non-residential activity.

**Number of firms and employment in the residential construction sector, 1999<sup>27</sup>**

	<b>TOTAL NUMBER OF FIRMS</b>	<b>TOTAL EMPLOYMENT</b>
Total Trade Contracting	3,171	16,140
Residential Trade Contracting (50% allocation of total trades)	1,585	8,070
Residential building and development	1,207	5,025
<b>TOTAL RESIDENTIAL SECTOR</b>	<b>2,793</b>	<b>13,095</b>

23 Nova Scotia Statistical Review 2000, p. 84.

24 PRAXIS Research & Consulting, Human Resources Study for the Home Building and Renovating Sector, Phase I and II Report, March 2000, p.6.

25 Ontario Construction Secretariat, The Underground Economy in Ontario's Construction Industry, November 1998, p.35.

26 Atlantic Provinces Economic Council, Economic Trends in the Nova Scotia Construction Sector, June 1999, p.17.

27 Based on data documented in PRAXIS Research & Consulting, Human Resources Study for the Home Building and Renovating Sector, Phase I and II Report, March 2000.



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