

# SKILL REQUIREMENTS AND TRAINING FOR CARPENTERS IN THE RESIDENTIAL CONSTRUCTION INDUSTRY IN NOVA SCOTIA

## FINDINGS REPORT

October 2005

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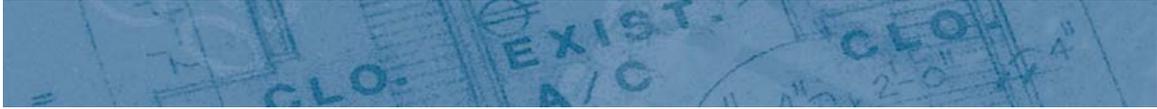


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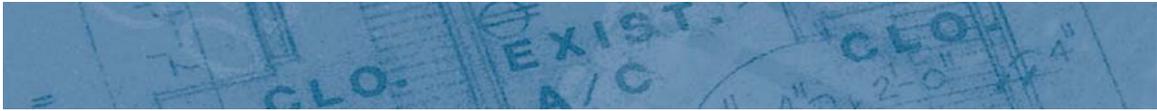
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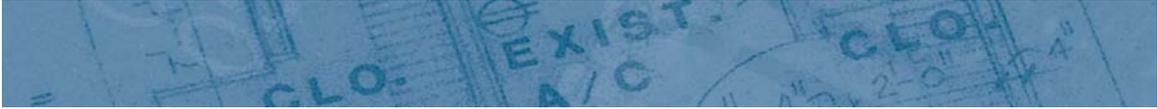


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## 1.0 Background and Introduction

This report addresses two Terms of Reference developed by the Atlantic Home Building & Renovation Sector Council (AHB&RSC) in February 2005:

- ▲ “Updating Skills Inventory”; and
- ▲ “Understanding the Residential Construction Labour Force”.

The Terms of Reference for the Updating Skills Inventory project describe the objectives for the project as follows:

*“The consultant will work with the AHB&RSC and a Project Advisory Committee to identify and document basic occupational skills requirements and standards for the residential construction industry. Activities will include research on existing occupational codes and profiles appropriate for the HB&R sector, review of the skills inventory undertaken in 1991-92, and consultations with industry representatives and key stakeholders to review the previous skills inventory and identify and define the current skills essential for the specific sector occupations.”*

The Terms of Reference for the Understanding the Residential Construction Labour Force project described objectives for this project as follows:

*“... an analysis of the scale, characteristics, inter-relationships and interactions for three segments of the construction labour force in Nova Scotia: the skilled HB&R segment, the unskilled construction segment, and residential trades that also work in the ICI sector.”*

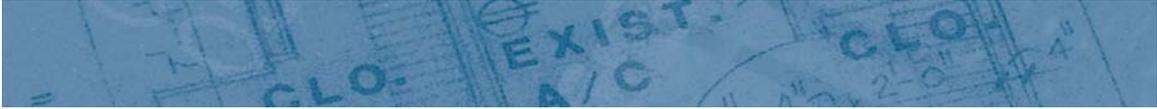
Discussions with the client at the commencement of the project resulted in a decision to take an integrated approach to meet the objectives of both projects within a single study. In defining the scope of the study, the Project Advisory Team, together with the consultants, considered recent research that addressed two occupations in the residential construction sector: 1) residential home builder and renovator, and 2) site supervisor. The former work was undertaken by the Sun Ridge Group in a 2004



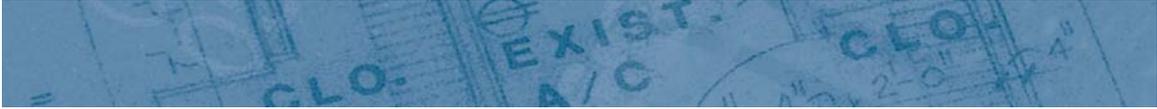
study commissioned by Canada Mortgage and Housing Corporation (CMHC): “Comparison and Analysis of Provincial Builder and Renovator Industry Programs”. This study provided a comprehensive overview of existing industry training and certification programs, analyzed through a comparison to the Tasks and Sub-tasks of the National Occupational Analysis for the New Home Builders and Residential Renovator Contractor. The second area of research was undertaken by the Construction Sector Council through the “Supervisory Training Skills Analysis” initiative. The objective of that study was to explore the feasibility of a national Supervisory Training standard and/or program for front-line supervisors, starting with an analysis of the skills required by these individuals. The AHB&RSC participated in several components of the project and coordinated input from Nova Scotia residential construction industry site supervisors.

It was therefore decided that this current study should complement the above research and focus on an examination of the training system for carpenters in Nova Scotia and the ability of this system to meet the needs of the residential construction industry. The carpentry occupation was chosen as the focus of the study because it is the most important trades occupation in the residential construction industry. This study conducts its examination as follows:

- ▲ Key issues in the training and supply of carpenters in the residential construction industry in Nova Scotia (NS), Prince Edward Island (PEI) and Newfoundland (NL) are presented. The issues focus on the role of the training system in the supply chain for carpenters.
- ▲ An analysis of skilled and unskilled components of the carpentry labour force in the home building sector in Nova Scotia is completed and the mobility of carpenters between the home building sector and other industry sectors, notably the ICI sector, is examined.
- ▲ The skills involved in the carpentry occupation according to the Human Resources Development Canada (HRDC) National Occupational Analysis (NOA 1998) are documented. NOA 1998 is used by training institutions across Canada to develop curricula and set standards for carpentry training programs.
- ▲ The apprenticeship system in Nova Scotia, and the skills taught in this system, are reviewed.



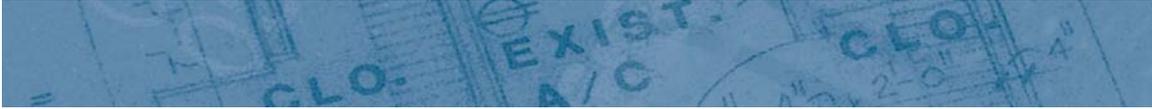
- ▲ The carpentry training program delivered by the Nova Scotia Community College through its carpentry Certificate and Diploma programs is reviewed.
- ▲ Findings from research and consultations on carpentry training and certification undertaken by the AHB&RSC are summarized.
- ▲ New systems being developed to train and certify carpenters in the residential construction industries in Saskatchewan, Alberta and British Columbia are reviewed.
- ▲ Conclusions are drawn on the effectiveness of carpentry training and apprenticeship systems in Nova Scotia in meeting the requirements of the residential construction industry. The benefits of alternative approaches to carpentry training being developed in western Canada are discussed and the need for follow-up research and consultations to determine the appropriateness of these new approaches in Nova Scotia is discussed.



## 2.0 Key Issues in the Training and Supply of Carpenters in the Residential Construction Industry

PRAXIS Research and Consulting Inc. completed a number of studies of human resource and labour supply issues in the construction and residential construction industries in Nova Scotia, Prince Edward Island and Newfoundland from 2001 to 2005. These studies identified the following key issues and problems associated with the training and supply of carpenters in these provinces.

- ▲ Recruitment into the occupation has declined precipitously in all three provinces since the early 1990s. For example, the 1991 and 2001 Census estimate that the number of carpenters in Nova Scotia under 25 years old dropped by 42% between 1991 and 2001.
- ▲ Employers in all three provinces reported significant difficulty recruiting skilled carpenters.
- ▲ Labour market data indicate that there were large numbers of unemployed carpenters in all three provinces. Research indicates that these unemployed carpenters did not have the skills and on-the-job experience required by employers.
- ▲ Research in all three provinces indicates that the institutional training and apprenticeship programs in those provinces contributed to the recruitment and labour supply problems for carpenters in a number of ways including:
  - Young people are not getting exposure to and experience with trades in high school. The lack of familiarity and exposure to the trades in high schools limits the number of young people who choose carpentry as a career option and also may reduce apprenticeship completion rates for those who choose to take this program. Data from PEI and NL show that a small minority of apprentices in these provinces enter the program directly out of high school.
  - Low apprenticeship completion rates limit the supply of carpenters across the entire country. This results from a variety of factors including: the number of hours of on-the-job experience required to complete the program, the lack of mandatory



certification in the carpentry trade, the seasonality of carpentry work and labour market difficulties experienced by apprentices.

- Research completed by PRAXIS in NL and PEI shows that graduates from institutional carpentry training had difficulty finding employment upon graduation for two reasons: (1) employers felt that graduates often lacked practical carpentry skills and were not “job ready” and (2) graduates of training institutions did not have the industry contacts and “track record” that enabled them to succeed in the job market.

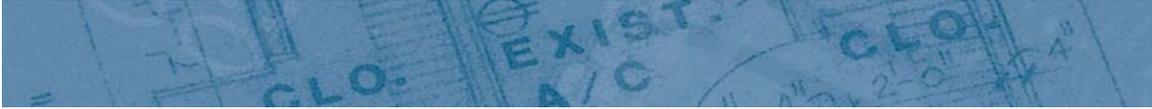
The lack of job readiness among graduates of training institutions was attributed by employers to an inadequate integration of classroom training and work on job sites. Findings from consultations held by the Co-Chairs of the Apprenticeship Public Consultations to the Nova Scotia Provincial Apprenticeship Board indicate that the integration of classroom training and work on job sites also is perceived to be an issue in Nova Scotia.

*“Placing pre-apprentices in a real-work environment early in their programs was noted to be critical to long-term success. Too often employers found graduates dissatisfied with actual working conditions. These were unknown or misunderstood by the student or not experienced as part of a co-op work term. Concern was also expressed about the disconnection between the clean environment of the NSCC campuses and the real world of work for many tradespeople.”<sup>1</sup>*

- Admission requirements acted as a barrier to trades training for some individuals.
- ▲ Surveys in PEI and NL completed by PRAXIS indicate that employers do not look to the institutional training system as a source for new workers. The research in these provinces indicates that a “disconnect” exists between the institutional training system and

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<sup>1</sup> Report of the Co-Chairs of the Apprenticeship Public Consultations to the Nova Scotia Provincial Apprenticeship Board, “APPRENTICESHIP – Achieving Excellence through Partnership”, December 2002, p. 22.



employers in the residential construction industry. The disconnect results from the perceived lack of “job readiness” among graduates of training institutions and the fact that carpenters do not have to be certified to practice their trade.

- ▲ Employers in PEI and NL provided very specific advice on how to improve carpentry training to better suit the requirements of the residential construction industry. The most important improvements suggested by employers were more effective industry input into the training system,<sup>2</sup> more effective linkages of training with on-the-job experience and the use of short training modules to provide specific skills required by workers.

A more complete presentation of findings from the NS, PEI and NL studies is presented in Appendix 1.

The above findings suggest that changes to training systems are required to prevent future shortages of carpenters in Atlantic Canada. A 2002 report on the apprenticeship program sums up the situation in Nova Scotia as follows:

*“The need to expand the number of apprentices entering the system, successfully completing the program, and achieving certification within as short a time as possible is critical to responding to anticipated labour market conditions. It is anticipated that we will need to double the number of new apprentices registering with the system by 2007. To achieve the objective of qualified journeypersons in Recommendation 1, the completion rate and the average time to complete will both have to improve.”<sup>3</sup>*

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<sup>2</sup> Employers expressed the desire to have decisive, rather than advisory, input into the training system.

<sup>3</sup> Report of the Co-Chairs of the Apprenticeship Public Consultations to the Nova Scotia Provincial Apprenticeship Board, “APPRENTICESHIP – Achieving Excellence through Partnership”, December 2002, p. 19.



### 3.0 Understanding the Residential Construction Labour Force

The residential construction labour force primarily is composed of trades workers. Most trades workers work in the construction industry that is composed of the following sectors:<sup>4</sup>

- ▲ Residential Building and Development (SIC 401)
- ▲ Non-Residential Building and Development (SIC 402)
- ▲ Industrial and Heavy (Engineering) Construction Industries (SIC 41)
- ▲ Trade Contracting Industries (SIC 42)
- ▲ Service Industries Incidental to Construction (SIC 44)

Many carpenters are classified in Trade Contracting but work in both the Residential and Non-Residential Building and Development sectors of the Construction Industry. Some carpenters specialize in Residential or Non-Residential Building while others alternate between these sectors. A report prepared by PRAXIS Research and Consulting Inc. for the Canada Mortgage and Housing Corporation indicates that there are 11 prominent construction trades with carpentry being the most common occupation.<sup>5</sup> This report focuses on the carpentry trade due to its relative importance, especially in Residential Building and Development.

The Census estimates that there were 6,045 carpenters in the labour force in Nova Scotia in 2001. Approximately one-third of this total were classified as working in the Building, Developing and General Contracting sector while roughly 45% worked in the trade contracting sector of the Construction Industry. The remainder of the carpentry labour force was spread across a variety of industry sectors notably Manufacturing with 8% of the carpentry labour force.

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<sup>4</sup> This definition of the construction industry follows the Standard Industrial Classification System (SIC E 1980).

<sup>5</sup> See CMHC Research Highlight, April 2005, Socio-economic Series 05-009 (<http://www.cmhc-schl.gc.ca/publications/en/rh-pr/index.html>).



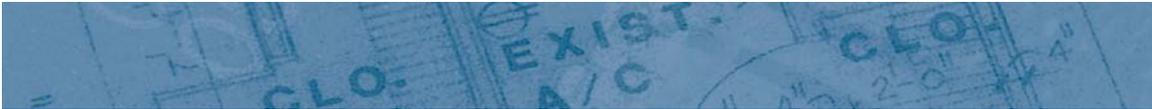
The 2001 Census estimates that approximately 86% of the carpenters in Nova Scotia who worked within the Building, Developing and General Contracting sector were classified as working in Residential Building and Development with the remaining 14% classified in Non-Residential Building and Development. Carpenters in the Trade Contracting sector were classified in the following sub-sectors: Interior and Finishing Work (52%), Structural and Related Work (41%) and Exterior Close-In Work (5%).

The Census labour force data cited above provide some information on the distribution of carpenters across industrial sectors but they do not provide information on the incidence of carpenters working in both the Residential and Non-Residential sectors of the Building Construction Industry. This issue is addressed in this section of the report followed by a discussion of the scale, characteristics, inter-relationships and interactions of the skilled and unskilled components of the home building labour market.

### **3.1 The Mobility of Carpenters Between the Residential and Non-Residential Sectors of the Building Construction Industry**

The 2001 Census classified workers by industry sector based on the sector they were working in during the reference week (Sunday to Saturday) prior to enumeration (May 15, 2001). If a person did not have a job during the reference week he/she was classified as being in the industry sector within which they worked the greatest amount of time in 2000.

The Census data provide a snapshot of the industry sectors within which the carpentry labour force worked in 2001 but provide no information on the movement of carpenters between sectors. For this reason, the Census data do not provide insights into the mobility of workers between residential and non-residential building. This section of the report provides information on mobility found in a number of studies that dealt with this issue.



A mobility study completed by Prism Economics<sup>6</sup> reported that 34.6% of carpenters in a national survey worked in both residential and non-residential building. The PRISM study indicates that this percentage was somewhat higher than the 28.5% reported by the Commission de la construction du Québec (CCQ) for carpenters in Québec.

A 2004 PRAXIS study prepared for the Canada Mortgage and Housing Corporation presents industry mobility data from two PRAXIS surveys of carpenters who drew Employment Insurance in Prince Edward Island and Nova Scotia in 2002. These results are summarized in Table 1.

**Table 1**

<b>EMPLOYMENT OF CARPENTERS BY SECTOR IN PEI AND NOVA SCOTIA IN 2002</b>	
<b>Sector</b>	<b>Share</b>
Exclusively residential	37%
Exclusively non-residential	12%
Both	45%
Miscellaneous	6%
<b>Total</b>	<b>100%</b>

Source: PRAXIS Research and Consulting Inc., “Report on Skilled Construction Labour Segmentation”, October 2004, p. 58

The PRAXIS report draws the following conclusions from the data presented in Table 1.

*“... 45% of carpenters in PEI and NS worked in both the non-residential and residential sectors in 2002. Also noteworthy is the percentage of carpenters who worked exclusively in residential construction. We have seen in Phase One of the report that 38.5% of carpenters in the construction industry labour force is employed by*

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<sup>6</sup> Prism Economics and Analysis, “The Mobility of Construction Workers: A Report to Human Resources Development Canada Labour Market Studies”, July 23, 2001.



*residential building firms. This suggests that among carpenters, at least, there is evidence of a distinct labour market for residential construction.”<sup>7</sup>*

The 2004 PRAXIS report also sheds some light on the mobility of carpenters between industry sectors. The study shows that a variety of factors including unionization and differing wage levels between residential and non-residential construction explain the lack of mobility between residential and non-residential building construction.

*“The degree of unionization and the resulting variation in wage levels affect the mobility of labour across industry sectors. Key informants also indicate that unionization inhibits mobility between sectors as a result of its restrictions on hiring in unionized work places. Unionized workers in non-residential construction sectors may be unwilling to move to residential sectors due to lower wages while non-union workers in the residential sector may be unable to work in the non-residential sector because they are not union members.”<sup>8</sup>*

### **3.2 Skilled and Unskilled Components of the Home Building Labour Market**

The National Occupational Classification system (NOC) groups all carpenters into one designated occupation regardless of skill levels and certifications. It is impossible to determine the proportion of highly skilled or journeymen carpenters by examining data based on the NOC system.

Evidence that the labour force for carpenters is segmented into skilled and unskilled components is based on information from employers and carpenters collected by PRAXIS from surveys, focus groups and individual interviews completed for studies in Prince Edward Island and Newfoundland and

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<sup>7</sup> PRAXIS Research and Consulting Inc., “Report on Skilled Construction Labour Segmentation”, October 2004, p. 58.

<sup>8</sup> Ibid, p. 63.



Labrador.<sup>9</sup> These studies show that employers and carpenters both believe that the carpentry labour force is segmented based on skill levels and that demand and supply conditions are different for the skilled and unskilled segments of the workforce. The PRAXIS research indicates that skilled workers are in high demand and short supply whereas there is a surplus of unskilled workers.

Employers and carpenters consulted in the PRAXIS research defined a skilled carpenter as someone having the on-the-job competencies required by employers. These individuals are capable of working independently with minimal supervision. Employers and carpenters consulted in the PRAXIS studies indicated that skill levels were not correlated with graduation from pre-employment carpentry training or the attainment of Certificates of Qualification. As a result, training and certification were not important factors that influenced hiring decisions of employers and the job prospects and wages received by carpenters. The PRAXIS research indicates that many employers in the residential construction industry do not look to training institutions as a source of new recruits, choosing instead to hire individuals based on referrals from within the industry or community.

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<sup>9</sup> See: (1) PRAXIS Research and Consulting Inc., “A Human Resources Study of the Construction Industry on Prince Edward Island – Findings and Policy Considerations”, August 2004; (2) PRAXIS Research and Consulting Inc., “A Human Resources Study of the Home Building and Renovation Sector, Phase III, for Newfoundland and Labrador, Key Findings”, January 2004; (3) PRAXIS Research and Consulting Inc., “A Human Resources Study of the Home Building and Renovation Sector, Summary Findings And Policy Implications for Newfoundland and Labrador”, May 2005.



## 4.0 National Occupational Analysis for the Carpentry Occupation – NOA 1998

### 4.1 Organization and Description of Skills

The HRDC National Occupational Analysis (NOA 1998) for carpentry is the basis for carpentry curricula and standards. It must be factored into occupational descriptions and training programs to ensure that provincial certifications are recognized inter-provincially. NOA 1998 is organized into Blocks, Tasks, Sub-tasks and Supporting Knowledge & Abilities as follows:

- ▲ *“BLOCK - is the largest division within the analysis and reflects a distinct operation relevant to the occupation.*
- *TASK - is the distinct activity that, combined with others, makes up the logical and necessary steps the worker is required to perform to complete a specific assignment within a "BLOCK".*
  - *SUB-TASK - is the smallest division into which it is practical to subdivide any work activity and, combined with others, fully describes all duties constituting a "TASK".*
    - *Supporting Knowledge & Abilities - The element of skill and knowledge that an individual must acquire to adequately perform the task.”<sup>10</sup>*

The top two levels of organization (i.e. Blocks and Tasks) for the carpentry trade are presented in Table 2. Table 2 shows that Block A describes the generic occupational skills of a carpenter while Blocks B through E describe trade specific skills for the four Blocks or trade specializations within the carpentry occupation: form work, framing, exterior and interior.

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<sup>10</sup> “Occupational Analyses Series – Carpenter, HRDC, 1998, page xiii.

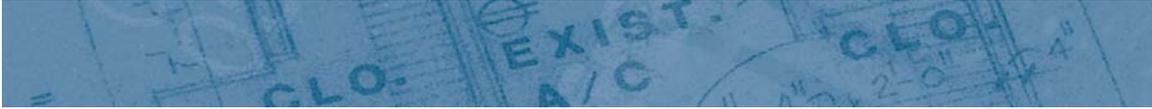


**Table 2**

<p><b>BLOCK A OCCUPATIONAL SKILLS</b></p> <p>Task 1 Uses tools, equipment and material</p> <p>Task 2 Uses contract documents</p> <p>Task 3 Performs project related skills</p> <p><b>BLOCK B FORM WORK</b></p> <p>Task 4 Builds footing, wall and column forms</p> <p>Task 5 Builds slab forms</p> <p>Task 6 Builds stair forms and auxiliary application</p> <p><b>BLOCK C FRAMING</b></p> <p>Task 7 Installs framing systems</p> <p>Task 8 Installs sheathing</p> <p><b>BLOCK D EXTERIOR</b></p> <p>Task 9 Installs doors and windows</p> <p>Task 10 Installs exterior trim and coverings</p> <p><b>BLOCK E INTERIOR</b></p> <p>Task 11 Installs flooring</p> <p>Task 12 Installs wall coverings</p> <p>Task 13 Installs ceilings</p> <p>Task 14 Installs interior doors/windows</p> <p>Task 15 Builds and installs stairs</p> <p>Task 16 Builds and installs cabinets, countertops and shelving</p> <p>Task 17 Installs architectural materials</p>
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[Occupational Analyses Series, Carpenter, HRSDC, 1998](#)

Sub-tasks that correspond to each of the Tasks identified in Table 2 are provided in NOA 1998. Specific skills associated with each Sub-task are described by the Supporting Knowledge and Abilities presented in NOA 1998. It is important to note that these skills are organized to support the completion of Sub-tasks and Tasks.



## 4.2 Essential Skills

Research completed for the Construction Sector Council (CSC) shows that there are nine essential skills<sup>11</sup> that are critically important in the construction industry.<sup>12</sup> The CSC has undertaken an Essential Skills Strategy designed to assist the workforce in the construction industry to achieve the levels of essential skills required to fully participate in training and employment. One component of this initiative is to incorporate essential skills into existing and new national construction trade/occupational standards. The Government of Canada has developed an essential skills profile for the carpentry occupation in conjunction with its efforts to update the National Occupational Analyses for this occupation.

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<sup>11</sup> The Government of Canada indicates that these skills are: Reading Text, Document Use, Writing, Numeracy, Oral Communication, Thinking Skills, Working with Others, Computer Use and Continuous Learning.

<sup>12</sup> See: The Construction Sector Council, “Essential Skills Strategy for the Construction Industry”, undated.



## 5.0 Apprenticeship for the Carpentry Occupation in Nova Scotia<sup>13</sup>

### 5.1 Overview of the Apprenticeship Program

Apprenticeship is a method of learning whereby the apprentice, “the learner”, works under the direct supervision of a journeyman to learn the practical dimensions of a trade. The typical length of an apprenticeship is four years. During this time, the apprentice’s on-the-job training is complemented with sessions of in-class technical training that allow the apprentice to take on increasingly difficult tasks when back on the job site.

The primary deliverer of the technical training portion of apprenticeship is the Nova Scotia Community College (NSCC). This training is course-based and lasts from five to six weeks each year during the apprenticeship. It is available through part-time and full-time classroom delivery, on-line delivery and blended on-line/classroom delivery. A training schedule for carpentry showing the dates and locations of training is available on the website of the Apprenticeship Training and Skill Development Division.<sup>14</sup>

It is important to distinguish apprenticeship training from the pre-employment certificate and diploma programs at the Nova Scotia Community College. The apprenticeship program gives credits to graduates of all pre-employment programs when they are in a relevant trade area and when the credit has been applied for within a prescribed period of time, usually two years from the point of obtaining the certificate or diploma.

Apprenticeship training in Nova Scotia is administered by the Apprenticeship Training and Skill Development Division (ATSD) of the provincial Department of Education. The Provincial Apprenticeship Board (PAB) advises the Minister of Education on all issues relating to the apprenticeship

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<sup>13</sup> This section is primarily based on a paper by PRAXIS Research and Consulting Inc. entitled: “Discussion Paper: Apprenticeship Training for Residential Construction Trades in Nova Scotia”, March 15, 2002; information provided by the Director of the Apprenticeship Training and Skill Development Division of the provincial Department of Education; and information obtained in an interview with the Executive Director of the Atlantic Home Building and Renovation Sector Council.

<sup>14</sup> See: <http://apprenticeship.ednet.ns.ca/>.



system and has the responsibility to recommend new trade designations and specifications of compulsory certified trades. The AHB&RSC is not represented on the PAB.

Trade advisory committees comprised of employers and employees are used in some provinces to facilitate industry input into training and curriculum development. In Nova Scotia, these committees were replaced in 1994 with a model of ad-hoc advisory committees that are used to review legislation, trade regulations and specific industry issues under the auspices of the PAB. As of 2005, the ATSDD is partnering with the NSCC to use the latter's program advisory committees as another avenue for industry to inform apprenticeship training. Industry is also invited to participate in week-long workshops to update curriculum standards maintained by the ATSDD for all apprenticeable trades as well as inform the NOA for its trade, and all aspects of examination development for the Red Seal trades.

A tripartite Memorandum of Understanding between the Province of Nova Scotia, Human Resources and Skills Development Canada and the Association of Sector Councils provides a vehicle to facilitate industry-government collaboration on the development and delivery of the apprenticeship program in Nova Scotia. The sector councils were part of the review process for the Apprenticeship Act and have been invited to consultations on proposed amendments. The AHB&RSC feels that it has a positive relationship with the Chair of the PAB and hopes that this input translates into more effective apprenticeship training in the near future.

Individuals must be employed in the carpentry trade before they can register as an apprentice. To register, individuals need to have successfully completed Grade 12, or an acceptable equivalent of education and experience. The ATSDD provides for the development of an individualized learning plan for apprentices who do not have Grade 12 or who need to refresh their essential skills in order to be successful in technical training. Apprentices participate in a user-friendly essential skills assessment and are provided tuition-free learning opportunities to enhance identified skills needs.

The term of apprenticeship for carpentry is four years. Upon successful completion of the program, the apprentice earns a Certificate of Qualification (CQ) recognizing the tradesperson as a skilled journeyman. Other ways of acquiring a CQ include challenging the certification examination upon



an approved Trade Qualifier application with the ATSDD or holding a provincial CQ that the Province of Nova Scotia recognizes.

Apprentices in the carpentry trade must complete 8,000 hours of time in the trade and all technical training requirements before qualifying to write the certification examination. Apprentices who have completed post-secondary training in the trade at the Nova Scotia Community College or a similar institution may receive theory and time credits towards their apprenticeship. Trade Qualifiers must complete 12,000 hours of time in the trade and make application through the ATSDD. The CQ is obtained when the candidate achieves a mark of 70% or higher on the certification examination.

Currently the ATSDD only has legislative authority to issue CQs for the full carpentry trade as defined by the NOA. Exceptions have been made in the Automotive Service Industry where sub-trades and exemptions have been in practice for many years. The ATSDD and hence government is required to be responsive to the needs of industry and the training system should have sufficient flexibility to be responsive to changing industry needs. At the same time, smaller jurisdictions such as Nova Scotia may have resource challenges associated with being more flexible and so a balance must be found. Industry has a responsibility to communicate the practical realities of a trade to government and to assist the government in developing a response that meets the identified needs.

## **5.2 New Initiatives**

The ATSDD is working to increase the accessibility of the apprenticeship system for under-represented groups, including women, African-Nova Scotians and Aboriginal Peoples. It is also very interested in increasing the likelihood that young people graduating from high school will choose a career in the skilled trades and technologies and has embarked on the development of a youth apprenticeship strategy, called “Workit!”, to provide program opportunities for in-school and out-of-school youth.

For the existing workforce, the ATSDD is investing in the development of a mentor/coach program for supervising journeypeople to assist them in helping their apprentices learn more effectively on-the-job.

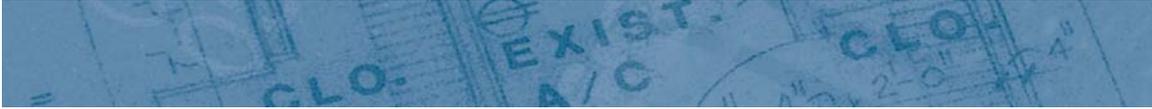


It is also creating a Blue Seal endorsement program in partnership with the NSCC to encourage leadership development and business management skills development for certified tradespeople.

### **5.3 Changes to Apprenticeship and Institutional Training Recommended by the AHB&RSC**

The AHB&RSC recommends the following changes to apprenticeship and institutional training:

- ▲ Recognition of trades specializations and the provision of industry-approved credentials for individuals completing the requirements of each trade specialty. This system would allow individuals interested in completing the full journeyman program to do so by receiving credentials in all of the trade specialty areas. The Sector Council believes that this system would allow people to enter the workforce more quickly with more appropriate skills. It also could provide the bases for a carpentry-based career path for individuals interested in this occupation. The Sector Council feels that this system would be beneficial for trainees who would receive credentials for skills competencies they develop and for employers who would be able to identify individuals with the specific skills they require.
- ▲ The initiation of Sector Council leadership in working with apprentice employers, to ensure professional employers, safe work sites and qualified journeymen as mentors. The Sector Council believes that this would encourage and support professionalism in the sector, provide support for good employers and journeymen, allow for appropriate training of apprentice employers and journeyman mentors and provide the Sector Council with an ongoing database of potential apprentice employers. The Sector Council also feels that it would provide a good starting point, and articulation, for the development of youth apprenticeship or co-op programs with high schools.
- ▲ Increased Sector Council involvement in the delivery of industry training, particularly overseeing the administration and required documentation where 'brokering' is required between employers to ensure that students are exposed to the full range of required skills. The Sector Council believes that skills obtained by individuals during the on-site training



component of apprenticeship are not being documented and this action would ensure an accurate documentation of these skills. The Sector Council feels this approach would relieve small employers of the burden of documenting skills on their own and would encourage more employers to participate in the apprenticeship program.

## **5.4 Organization and Description of Skills**

### **5.4.1 Tasks and Program Outcomes for the Carpentry Trade**

The National Occupational Analysis (NOA) for carpentry is used as the base document in the development of standards for the occupation. The Tasks contained in the NOA form the program outcomes for the trade although they do not necessarily delineate the units of instruction.

The program outcomes for carpenters list the 17 Tasks that apprentices must be able to accomplish to complete the program as presented in Table 3.<sup>15</sup>

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<sup>15</sup> See: ATLANTIC CANADA APPRENTICESHIP TRAINING STANDARD, CARPENTER, Printed: 01 September 2004, m:\curricul\carpentr\version2, p. 1.



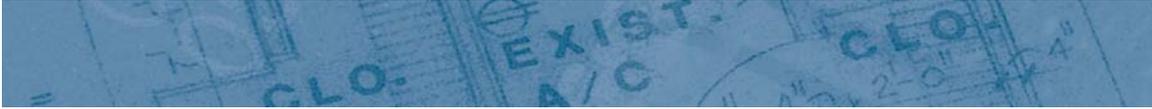
**Table 3**

Task 1 Uses tools, equipment and material
Task 2 Uses contract documents
Task 3 Performs project related skills
Task 4 Builds footing, wall and column forms
Task 5 Builds slab forms
Task 6 Builds stair forms and auxiliary application
Task 7 Installs framing systems
Task 8 Installs sheathing
Task 9 Install doors and windows
Task 10 Installs exterior trim and coverings
Task 11 Installs flooring
Task 12 Installs wall coverings
Task 13 Installs ceilings
Task 14 Installs interior doors/windows
Task 15 Builds and installs stairs
Task 16 Builds and installs cabinets, countertops and shelving
Task 17 Installs architectural materials

### **5.4.2 The Process for Developing the Apprenticeship Curriculum Standard**

Subject matter experts and/or curriculum developers are assigned to develop apprenticeship curriculum standards in a course-based format conforming to the structure and format process approved by the Atlantic Standards Partnership. This partnership is an agreement of the Atlantic Apprenticeship Council consisting of the Atlantic Directors of Apprenticeship and Board Chairs to cooperate in the development of curriculum standards.

An environmental scan is conducted of other jurisdictions and training institutions to see if there is curriculum currently available. In the case of the carpenter trade, the Interprovincial Common Core Curriculum Standard (ICCCS) was used as an overall content guide. The ICCCS was developed based on the NOA and contained all training elements common to jurisdictions across Canada.



Apprenticeship stakeholders (industry, government and education representatives) were asked to review the standards and provide feedback. Based on this feedback, more detail was added in many of the units and a new course in Renovation was included for delivery in Nova Scotia.

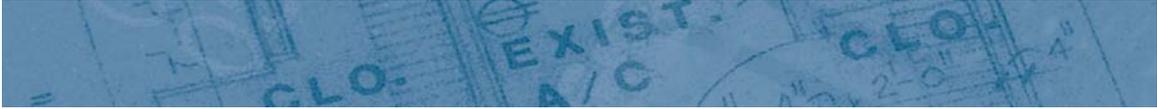
The ICCCS document was already divided into units of instruction with defined outcomes and content detailed as theory statements. The Apprentice Training and Skill Development Division was able to repackage the units for delivery based on provincial needs. For mobility purposes, an equivalency chart included at the beginning of the document relates the courses to the ICCCS course units. The carpentry courses in Nova Scotia and their alignment with the Interprovincial Common Core Curriculum Standard are presented in Table 4.<sup>16</sup>

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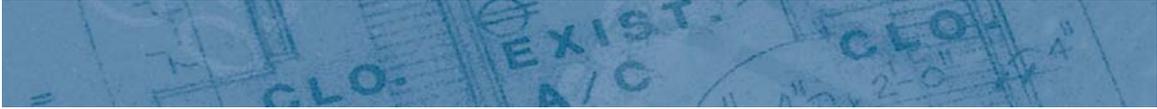
<sup>16</sup> Table 4 was provided by the Director of the Apprenticeship Training and Skill Development Division of the provincial Department of Education.

**Table 4**

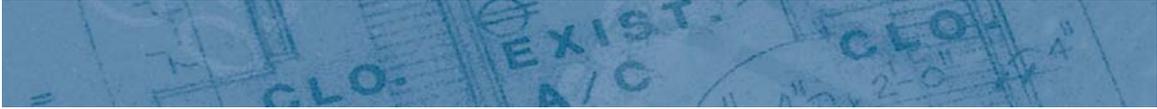
Nova Scotia Courses	NS Prerequisites	Alignment with Interprovincial Common Core Curriculum Standard
<b>Group A</b>		
CARA-0800 Construction Safety	None	A.3.1. Personal Protective Clothing and Equipment
		A.3.2. Fall Protection
		A.3.3. Working Environments
		A.3.4. Industrial Health Hazards
		A.3.5. Statutory Documents
		A.7.1. Ladders and Ramps
		A.7.2. Access and Temporary Structures
		A.7.3. Suspended Access Equipment
		A.7.4. Hoarding
CARA-0801 Carpentry Tools	None	A.2.1. Tools and Equipment Theory
		A.2.2. Tools and Equipment Application
CARA-1819 Residential Foundations	CARA-0800, 0801, 0824	A.6.1. Site Layout Theory
		A.6.2. Site Layout Application
		B.1.1. Footing, Slab-On-Grade and Grade Beam Forms Theory
		B.2.1. Footing, Slab-On-Grade and Grade Beam Forms Practical
		B.1.2. Wall, Column, Pier and Pile Forms Theory
		B.2.2. Wall, Column, Pier and Pile Forms Practical
CARA-1820 Residential Framing	CARA-0800, 0801, 0824	C.1.1. Beams and Supports Theory
		C.1.2. Floor Framing Theory
		C.2.1. Frame Floors (Platform) Practical
		C.1.3. Wall and Partition Framing Theory
		C.2.2. Frame Walls and Partitions Practical
CARA-0802 Construction Blueprints	None	A.4.1. Construction Documents



Nova Scotia Courses	NS Prerequisites	Alignment with Interprovincial Common Core Curriculum Standard
<b>Group B</b>		
CARA-1821 Gable Roofs	CARA-1820	C.1.4. Roof Framing Theory
		C.2.3. Frame Intersecting Roofs Practical
CARA-1803 Equal Sloped Hip Roofs	CARA-1821	C.1.4. Roof Framing Theory
		C.2.3. Frame Intersecting Roofs Practical
CARA-1804 Intersecting Roofs of Equal Slope	CARA-1803	C.1.4. Roof Framing Theory
		C.2.3. Frame Intersecting Roofs Practical
CARA-1805 Exterior Finish	CARA-0800, 0801, 0802, 0824	D.1.1. Windows Theory
		D.2.1. Windows Practical
		D.1.2. Roof Coverings Theory
		D.2.2. Roof Coverings and Accessories Practical
CARA-1806 Exterior Siding/Cladding	CARA-0800, 0801, 0802, 0824	D.1.3. Wall Coverings and Trim Theory
		D.2.3. Wall Coverings and Trim Practical



Nova Scotia Courses	NS Prerequisites	Alignment with Interprovincial Common Core Curriculum Standard
<b>Group C</b>		
CARA-1807 Floor, Wall and Ceiling Coverings	CARA-0800, 0801, 0802, 0824	E.1.1. Flooring Theory
		E.2.1. Flooring Practical
		E.1.2. Wall Coverings Theory
		E.2.2. Wall Coverings Practical
CARA-1808 Interior Doors and Trim	CARA-1807	N/A
		E.1.4. Doors and Jambs Theory
		E.2.4. Doors and Jambs Practical
		E.1.5. Hardware, Accessories and Fixtures Theory
		E.2.5. Hardware, Accessories and Fixtures Practical
CARA-1809 Common Stairs	CARA-0800, 0801, 0802, 0824	E.1.6. Stairs Theory
		E.2.6. Stairs Practical
CARA-1810 Cabinets and Millwork	CARA-0800, 0801, 0802, 0824	E.1.7. Cabinets Theory
		E.2.7. Cabinets Practical
		E.1.8. Interior Finish Theory
		E.2.8. Interior Finish Practical
CARA-1811 Advanced Roofs	CARA-1804	C.1.4. Roof Framing Theory
		C.2.3. Frame Intersecting Roofs Practical



Nova Scotia Courses	NS Prerequisites	Alignment with Interprovincial Common Core Curriculum Standard
<b>Group D</b>		
CARA-1814 Energy Efficient Construction	CARA-1804, 1805, 1806, 1819, 1820	A.5.1. Building Science Principles
		A.5.2. Building Science Techniques
		A.1.7. Building Envelope
CARA-1817 Renovation	CARA-1804, 1808, 1810, 1814	N/A
CARA-1812 Advanced Stairs	CARA-1809	B.1.3. Stair Forms Theory
		B.2.4. Stair Forms Practical
		E.1.6. Stairs Theory
		E.2.6. Stairs Practical
		E.1.6. Stairs Theory
		E.2.6. Stairs Practical
CARA-1813 Heavy/Commercial Construction	CARA-1807, 1819, 1820,	A.1.4. Concrete Theory
		A.1.5. Concrete Practical
		B.1.4. Forms for Precast
		B.1.5. Suspended Slab and Beam Forms Theory
		B.2.3. Suspended Slab and Beam Forms Practical
		E.1.3. Ceiling Theory
		E.2.3. Ceiling Practical
CARA-1815 Commercial Blueprint Reading & Estimating	CARA-0800, 0801, 0802	A.4.2. Quantity Surveying
CARA 1825 Review		N/A



Nova Scotia Courses	NS Prerequisites	Alignment with Interprovincial Common Core Curriculum Standard
<b>Other</b>		
Covered throughout the program where the information is applied (ICCCS)	None	A.1.1. Wood and Wood Products
		A.1.2. Non-wood Products
		A.1.3. Concrete and Concrete Products
		A.1.6 Fasteners/Adhesives/Sealants/Fillers
		A.5.3. Building Math/Geometry

The Curriculum Standard for the Carpenter trade describes the minimum theoretical content for the Nova Scotia apprenticeship training program. The document is intended to assist programming staff and instructors in the design and delivery of theoretical training and instruction. It has been developed based on the National Occupational Analysis for the Carpenter trade and the Interprovincial Common Core Curriculum Standard.

A copy of the Curriculum Standard document can be viewed at [www.apprenticeship.nsc.ca](http://www.apprenticeship.nsc.ca).



## **6.0 Carpentry Training Provided by the Nova Scotia Community College**

### **6.1 Overview**

There are two carpentry curricula delivered at the Nova Scotia Community College (NSCC): the Diploma program and the Certificate program. The Diploma program is two years in duration and was being taught at five campuses in Nova Scotia as of summer of 2005. The Certificate program is one year in duration and was being taught at the Lunenburg campus of the NSCC in the summer of 2005.

The curriculum consultant for trades and technology at the NSCC provided the following overview of the status of the Carpentry Certificate and Diploma programs in an interview completed for this study.

The Carpentry Certificate program has been around for a long time and has not changed a lot in recent years. There were plans to terminate the program in the past but it is still offered at the Lunenburg campus. Officials at the NSCC are reviewing what to do with this program at the present time. One option would be folding it in with the Carpentry Diploma program. The Carpentry Certificate program closely reflects the first year of the Carpentry Diploma program but the programs should be fully aligned if the Certificate program is to continue. The second option would be to differentiate the program by developing something new using basic carpentry as a base of knowledge.

The Carpentry Diploma program was designed based on the skills and outcomes defined in the apprenticeship program and local focus group input rather than being based on NOA 1998. This was possible because the skills and outcomes defined in the apprenticeship program were based on NOA 1998.

Courses in the NSCC programs are designed to be self-contained and do not have to be delivered in sequence, although there are some basic prerequisites. Current NSCC delivery of core Carpentry is program-based. In order to accommodate training for specific carpentry specialties, the NSCC would have to schedule courses at specific times of day so that individuals could select and complete all courses related to a specific trade specialization. The College has no immediate plans to go in this direction due to the costs and logistics involved. There are many other possibilities that could be looked at to provide



flexible, specialized carpentry training such as evening courses or Internet-based training. Funding, of course, is always an issue.

Both the Carpentry Certificate and Diploma programs are oriented towards the residential construction sector. Energy efficient materials and techniques are covered in each course and neither have specific non-residential content.

Individuals graduating from the two year Carpentry Diploma program earn one year's worth of hours towards their certification as journeyed carpenters through the apprenticeship program plus credit for the corresponding (by outcomes) technical training courses.

The Diploma program has work terms in both years of the program. Students sent to work placements in May are usually successful in finding employment. There is a strong demand for carpenters evidenced by the fact that companies sometimes contact NSCC campuses in November looking for trainees who may have discontinued their programs.

A carpentry focus group was held to facilitate industry input into Diploma program outcomes and the program has been developed based on that input. Later attempts to convene meetings with industry were unsuccessful for a variety of reasons but the curriculum for the carpentry Diploma program was circulated widely for comment from the industry including sector councils, the Nova Scotia Home Builders' Association and through recorded meetings between faculty and industry contacts at a local level.

Participants in the focus groups asked for an "introduction to renovation course" which has been added to the NSCC curriculum. A separate renovation program is not possible because individuals need to acquire basic carpentry skills before they can take such a program, and NSCC programming does not go beyond basic skills. The provision of more advanced skills is the responsibility of apprenticeship.

Despite the industry consultation efforts noted above, the AHB&RSC expressed concern about the responsiveness of the NSCC to its input.



There is an initiative underway at present to set up an industry advisory council called the Dean’s Advisory Council for high level policy and programming advice. There will likely be a second level of consultation for input into specific programs. There are a number of levels involved in the linkages between institutional training and employers in terms of providing employment opportunities to graduates of training programs. The first is the PAC although this committee has been inactive. The second is the Department Chairs and faculty at the various NSCC campuses who maintain industry contacts and set up placements for program graduates.

## 6.2 Organization of Skills

The Certificate program for carpentry at the NSCC was organized by course as follows as of August 2005 as shown in Table 5.

**Table 5**

<b>2005 PROGRAMS &amp; COURSES CARPENTRY CERTIFICATE PROGRAM NSCC</b>	
CARP 1000 Construction Safety I	60 hrs
CARP 1001 Hand Tools	60 hrs
CARP 1002 Portable Power Tools	60 hrs
CARP 1003 Stationary Power Tools	60 hrs
CARP 1004 Blueprint Reading	60 hrs
CARP 1005 Construction Estimating	60 hrs
CARP 1006 Foundations	120 hrs
CARP 1007 Floor and Wall Framing	120 hrs
CARP 1008 Roof Framing	120 hrs
CARP 1100 Work Experience I - CARP	175 hrs
COMM 1227 Communications I	30 hrs
COMM 1228 Communications II	30 hrs
COMP 1217 Computer Applications I	30 hrs
COMP 1218 Computer Applications II	30 hrs

Nova Scotia Community College Website: as of August 19, 2005:  
[http://www.nsc.ca/Learning\\_Programs/Programs/PlanDescr.aspx?prg=CARP&pin=CARPENTRY](http://www.nsc.ca/Learning_Programs/Programs/PlanDescr.aspx?prg=CARP&pin=CARPENTRY)



The courses included in the Diploma program as of August 2005 are included in Table 6.

**Table 6**

<b>2005 PROGRAMS &amp; COURSES            CARPENTRY DIPLOMA PROGRAM            NSCC</b>	
CARP 1010 Construction Safety	75 hrs
CARP 1011 Tools I (Hand Tools)	75 hrs
CARP 1012 Tools 2 (Portable Power Tools)	60 hrs
CARP 1013 Foundations I (Site Layout)	60 hrs
CARP 1014 Building Science	30 hrs
CARP 1016 Foundations II (Forms/Footings)	60 hrs
CARP 1017 Tools 3 (Stationary Power Tools)	60 hrs
CARP 1018 Construction Estimating	60 hrs
CARP 1021 Floor and Wall Framing	150 hrs
CARP 1100 Work Experience I - CARP	175 hrs
CARP 3001 Construction Blueprint Reading	60 hrs
CARP 3002 Common Stairs - Intro to	60 hrs
CARP 3003 Roof Framing I (Gable Roof)	90 hrs
CARP 3004 Trade Practice/Self-Identified Projects	90 hrs
CARP 3005 Siding and Cladding	60 hrs
CARP 3006 Exterior Finish	60 hrs
CARP 3007 Trade Communications	60 hrs
CARP 3009 Roof Framing II (Hip Roof)	60 hrs
CARP 3010 Roof Framing III	60 hrs
CARP 3011 Interior Trim	60 hrs
CARP 3012 Renovation - Intro to	60 hrs
CARP 3100 Work Experience II - CARP	175 hrs
COMM 1227 Communications I	30 hrs
COMM 1228 Communications II	30 hrs
COMP 1217 Computer Applications I	30 hrs
COMP 1218 Computer Applications II	30 hrs

Nova Scotia Community College Website as if August 19, 2005:

[http://www.nsc.ca/Learning\\_Programs/Programs/PlanDescr.aspx?prg=CARD&pln=CARPENTDIP](http://www.nsc.ca/Learning_Programs/Programs/PlanDescr.aspx?prg=CARD&pln=CARPENTDIP)



The entrance requirements to the NSCC are completion of Grade 12 or equivalent. The NSCC has access pathway programming available to individuals who do not meet admission requirements. The Adult High School program of the Department of Education program is delivered by the NSCC to assist applicants to meet entrance requirements.

## **6.3 Description of Skills**

### **6.3.1 Carpentry Certificate and Diploma Programs**

The skills included in the latest detailed Carpentry curricula<sup>17</sup> for the Carpentry Certificate and Diploma programs are identified in two areas of the curricula: Program Outcomes and detailed course descriptions. The skills listed in the Program Outcomes for the Carpentry Certificate and Diploma programs are presented in Appendix 2 and 3 respectively.

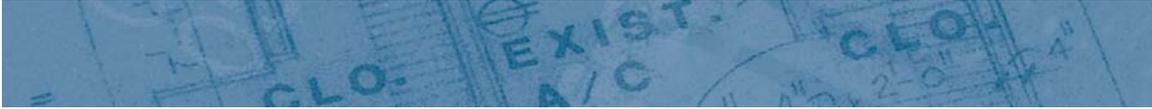
## **6.4 Concerns of the AHB&RSC**

The AHB&RSC expressed a number of concerns about carpentry training at the NSCC:

- ▲ Employers and/or the Sector Council are not involved in the training process. The Sector Council feels that it is not able to provide input into the portfolio of skills and experience that students develop as they go through the program. The portfolio would allow employers to match their requirements to the skills and experience of trainees.
- ▲ Potential students are not adequately screened to ensure they have a good awareness of what residential construction involves. As a result, individuals are entering the carpentry training program and then finding that they do not like or are not suited to the industry.
- ▲ The current training system jumps around too much between the carpentry trade specialties areas (i.e. foundations, framing, etc.), never completing one set of skills at a

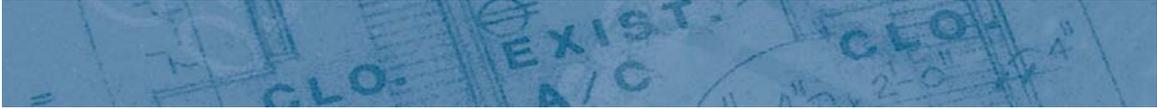
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<sup>17</sup> See the Carpentry Certificate, CURRICULUM, Carpentry Revision 1.1, NSCC, May 2000 and the Carpentry Diploma, CURRICULUM, Revised June 10, 2004, NSCC, May 2003.



time. This makes it difficult to encourage a more immediate reinforcing of skills either through the classroom training or through on-site experience. As a result, the AHB&RSC feels that the skills and knowledge acquired by students are mostly superficial and not helpful for students or employers who hire them.

- ▲ Carpentry students at the NSCC cannot get any credential unless they complete a lengthy training program that includes all aspects of construction, from rough framing to finish carpentry. As a result, the AHB&RSC believes that many drop out of the program or become bored with the parts they do not like.
- ▲ The AHB&RSC feels that the teaching of residential construction skills is not consistent at the various NSCC campuses. The AHB&RSC also feels that some instructors do not stay abreast with changes in building methods and technology.



## 7.0 Competency-Based Training and Certification in the Residential Construction Sector of Nova Scotia

PRAXIS Research and Consulting Inc. produced a report on March 23, 2003 entitled “Report on Research and Consultations – Competency Based Assessment Framework for the Residential Construction Sector”. The report summarizes the findings from research and consultations undertaken by the AHB&RSC. It identified five core priorities for human resource development.<sup>18</sup> Two of these priorities are directly relevant to this study:

- ▲ Recognition of the Home Building and Renovation (HB&R) Sector

*“The HB&R sector has specific and unique characteristics that are not adequately recognized and addressed in institutional policies and programs and in occupational standards.” ... “Despite these distinctive elements, HB&R industry leaders have continuing concerns that governments and training institutions still see the HB&R sector as the same as, or simply as a sub-sector of, the industrial, commercial and institutional (ICI) construction industry.”*

- ▲ Training and Certification for Trades Specializations

*“Current education, training and apprenticeship programs are often not suited to the diverse and changing labour force conditions that are typical of residential construction. Employers (particularly those engaged in sub-contracting work) are often looking for people with advanced knowledge and skills in particular trades specialisations, and find that graduates of full programs lack these specific competencies. By the same token, trades students and apprentices who return to industry jobs before completing their full programs receive no formal recognition for the knowledge and skills they have acquired. Employers, and many students and*

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<sup>18</sup> PRAXIS Research and Consulting Inc., “Report on Research and Consultations – Competency Based Assessment Framework for the Residential Construction Sector”, March 2003. pp. 1-3.



*apprentices, are interested in shorter-term, modularized training to provide advanced competencies as framers, drywallers, finish carpenters, roofing specialists, etc.”*

The PRAXIS report proposes a new approach to dealing with the human resource priorities of the home building and renovation sector. This approach includes:<sup>19</sup>

- “1. Development of industry supported occupational standards for certification and licensing for the HB&R sector, including the recognition of trades specializations;*
- 2. Establishment of a formal governance body to carry out certification and licensing based on the new standards;*
- 3. Implementation of a prior learning and assessment process to certify or license contractors and tradespersons who are already established professionals but have not had formal training; and*
- 4. Building effective partnerships between industry and the deliverers of training and apprenticeship to harmonize curricula and program designs with new industry standards and occupational categories.”*

The PRAXIS report calls for the introduction of a competency-based assessment approach to training and certification that is defined as follows:

*“Use of the term ‘competency’ is increasingly accepted as a means to describe the blend of knowledge, practical skill and experience needed to master a discrete workplace task or responsibility. ‘Competency-based assessment’ is an alternative approach to certification that focuses on the actual ability to carry out workplace tasks and responsibilities rather than on the traditional training ‘credentials’. It does not*

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<sup>19</sup> Ibid, p. 4.



*matter how the individual acquired the competency – the challenge is simply to determine whether s/he has it.*<sup>20</sup>

The PRAXIS report develops a competency-based assessment model where:

*“... competencies are assessed on the basis of pre-defined units of knowledge, skills and experience required for the successful and safe performance of discrete workplace tasks. Once these competencies are defined, and methods of assessing whether an individual has them or not are identified, it becomes possible to reorient certification procedures to actual work competencies, and to integrate prior learning assessment and recognition with regular human resource management processes in the workplace.”<sup>21</sup>*

The PRAXIS report indicates that the AHB&RSC received direction from the residential construction industry to proceed with the development of a competency-based assessment model as a foundation for new training and certification approaches. In this light the PRAXIS report:

*“... elaborate(s) an up-to-date, competency based assessment framework for HB&R contractors and for carpentry trades workers (including trades specializations) within the HB&R sector in Nova Scotia.”<sup>22</sup>*

The PRAXIS report developed a Competency-Based Assessment Grid based on consultations with employers in the residential construction industry which is described as follows:

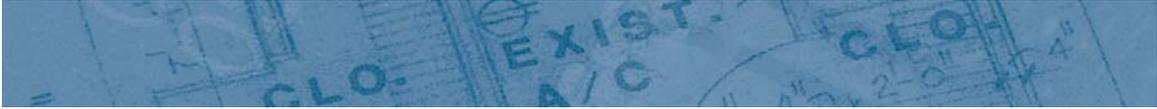
*“The framework would provide a basis for certification of home builder owner operators, residential construction supervisors, and residential carpentry trades*

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<sup>20</sup> Ibid, p. 5.

<sup>21</sup> Ibid, p. 6.

<sup>22</sup> Ibid, p. 6.



*workers. It would also facilitate designation of trades specializations within the carpentry field. The listing of tasks and sub-tasks in the occupational framework was adapted from the National Occupational Analysis (NOA) system for carpenters, residential construction supervisors, and for new home builders and residential renovation contractors. Changes were made to the existing NOCs to more accurately reflect competencies specifically relevant to residential construction, and to add in elements having to do with ‘soft skills’.”*

*“The grid is a framework of competencies: it would be left to a licensing certification board to determine the professional categories (including trades specializations) to be utilized, and the specific knowledge, skill and experience standards for each competency.”<sup>23</sup>*

The grid contains five levels of competencies as identified by employers in various sectors of the residential construction industry: (1) Entrant Helper, (2) Apprentice, (3) Journeyperson, (4) Master and (5) General Manager/Owner Operator.<sup>24</sup> The grid was subsequently reviewed and revised by eight individuals representing key sectors of the home building and renovations industry.

The PRAXIS report identified follow up work required before a new competency-based system could be finalized and implemented including:

*“There is also a need to access specialized technical expertise in competency-based assessment and PLAR to move the system design to a more advanced stage of elaboration now that it has substantial industry support.”<sup>25</sup>*

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<sup>23</sup> Ibid, p. 22.

<sup>24</sup> Ibid, pp. 23-24.

<sup>25</sup> Ibid, p. 27.



## 8.0 Alternative Approaches to Training and Certification

### 8.1 Saskatchewan

#### 8.1.1 Overview of the Saskatchewan Initiative

The Saskatchewan Home Builders' Association (SHBA), in conjunction with the Saskatchewan Apprenticeship and Trade Certification Commission (ATCC), has developed occupational analyses for the following trade specializations within the carpentry occupation: concrete former, framer, exterior finisher and interior finisher.

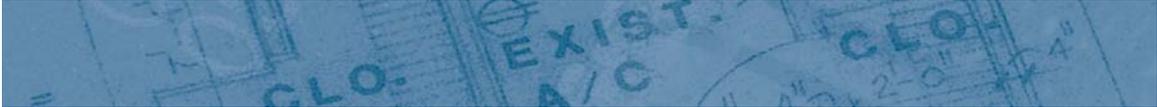
This initiative is part of a training strategy developed to encourage individuals to pursue a career in residential construction and to promote a professional image of the industry. The SHBA felt that it was necessary to develop this strategy because the supply of carpenters was inadequate to demand in the residential construction industry. The Saskatchewan Home Builders' Association described their training strategy as follows:

*“The strategy was for industry, in partnership with the Apprenticeship and Trade Certification Commission, to develop residential occupations, which would lead to training and certification within the provincial Apprenticeship system. The goal is to ensure that all people entering the residential construction industry have the opportunity to work towards a designation within the provincial Apprenticeship system.”<sup>26</sup>*

The process used to develop the occupational analyses for the residential construction industry was described as follows on the Saskatchewan Home Builders' Association website:

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<sup>26</sup> Saskatchewan Home Builders' Association, “SHBA CURRENT ISSUES HUMAN RESOURCE STRATEGY DEVELOPMENT”, <http://www.saskhomebuilders.ca/sections.php?op=viewarticle&artid=15>.



*“A list of job activities (both in the office and in the field) was compiled by interviewing construction managers and other individuals involved in, and knowledgeable about, the residential construction industry in Saskatchewan. With their assistance, the job activities were then grouped into residential construction occupations.*

*A Development Group and a Validation Group were compiled to help develop occupational profiles for each identified occupation. The groups consisted of people that have worked in residential construction for several years on a daily basis, and ranged from individuals working in large organizations to those working in small, owner-operated companies. The responses from the Development Group were used to develop draft Occupational Profiles.*

*The draft Occupational Profiles were sent to the Validation Group, which was asked to verify the information in the Occupational Profiles.*

*Because the Occupational Analyses (produced by HRSDC) do not distinguish between tasks for non-residential and residential construction, each Occupational Analysis was reviewed and analyzed. Tasks that were identified as being applicable to residential construction were identified and separated from the document.”<sup>27</sup>*

Two of the four trade specializations of the carpentry occupation appear on the designated trades list of the Apprenticeship & Trade Certification Commission (ATCC) of the Government of Saskatchewan.<sup>28</sup> These are framer and concrete former. The website indicates that the course content and certification requirements for the framer trade specialization are currently under review. The ATCC had already

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<sup>27</sup> See the Apprenticeship & Trade Certification Commission of the Government of Saskatchewan website: [http://www.saskapprenticeship.gov.sk.ca/modules.php?name=Files&\\_action=securefiles\\_DirectorySelect&entry\\_id=36&ms=1125670652#Concrete%20Finisher](http://www.saskapprenticeship.gov.sk.ca/modules.php?name=Files&_action=securefiles_DirectorySelect&entry_id=36&ms=1125670652#Concrete%20Finisher).

<sup>28</sup> Ibid.

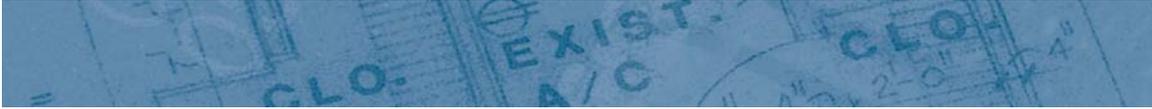


developed carpentry curriculum on a trade specialization basis, including curriculum for the framer trade specialization. As a result certification examinations for framers could be developed. The SHBA has been encouraging employers and carpenters to write the examination to become certified as framers and approximately 90 individuals had done so as of September 2005. Twelve individuals passed the examination and are awaiting ATCC verification of the hours on the job required for certification as a framer.

Individuals wishing to enter the apprenticeship program for the concrete former trade must be under the supervision of a certified trades person. The website indicates that employers usually prefer individuals with a Grade 12 education and that high school completion will ensure entry into the trade but that academic requirements for entry into this trade are no longer related to high school grade level. Successful completion of apprenticeship in this trade specialization requires a total of 3,600 hours of training over three years including two four-week classroom training sessions.

An interview with the Executive Director of the SHBA indicates that:

- ▲ A survey of SHBA members revealed that members felt that the carpentry trade lacked value and there was no career path in the trade. Questions also arose in the survey about the appropriateness of apprenticeship for the residential construction industry. Members felt it was oriented more to the Institutional, Commercial and Industrial (ICI) sector.
- ▲ The ATCC was receptive to the SHBA's plans for the carpentry trade. This response from the ATCC reflects the positive relationship between the SHBA and the ATCC. The ATCC provided an official to coordinate the development of occupational descriptions of the carpentry trade specializations.
- ▲ The occupational description for the framer trade specialization is not specific to residential construction and could apply to all industry sectors where framers work.
- ▲ One aspect of training in carpentry that the SHBA feels needs improvement relates to new technology and the on-going updating of the technology skills of journeymen.



### 8.1.2 The Occupational Analysis of Framers

The occupational analyses for the carpentry trade specializations in Saskatchewan follow the same organizational structure that is used in NOA 1998 as outlined in Section 4 of this report, that is, Blocks, Tasks, Sub-tasks and Supporting Knowledge & Abilities. Block A in the Saskatchewan system describes the occupational skills of the various carpentry trade specializations while Block B describes the trade specific skills for each trade specialization. A comparison of the Blocks and Tasks for framers contained in the Saskatchewan and NOA 1998 systems is presented in Table 7.

**Table 7**

<b>OCCUPATIONAL ANALYSIS FOR FRAMERS</b>	
<b>Saskatchewan Home Builders' Association</b>	<b>NOA 1998</b>
<b>Occupational Skills (Block A)</b>	<b>Occupational Skills (Block A)</b>
- Task 1 - Uses tools and equipment	- Task 1 - Uses tools, equipment and material
- Task 2 - Uses building materials	
- Task 3 - Interprets construction documents	- Task 2 - Uses contract documents
- Task 4 - Performs project related skills	- Task 3 - Performs project related skills
<b>Framing (Block B)</b>	<b>Framing (Block C)</b>
- Task 5 - Lays out framing systems	- Task 7 - Installs framing systems
- Task 6 - Constructs framing systems	- Task 8 - Installs sheathing
- Task 7 - Installs exterior doors	

Sources: "Framer - Subtrade of Carpenter", Provincial Occupational Analysis, Draft #2, Saskatchewan, 2005 and "Occupational Analyses Series - Carpenter", HRSDC, 1998

Table 7 shows that the skills of a framer are organized into seven Tasks in the Saskatchewan system compared to five in the NOA 1998 system. A detailed comparison of skills, Sub-tasks, Tasks and Blocks for carpenters in the Saskatchewan system to those in NOA 1998 is presented in Appendix 4. The comparison shows that while there were some differences in the skills included in the two systems the major difference was the way skills were organized into Sub-tasks, Tasks, Blocks and ultimately occupations. The most important difference is that carpentry skills in the Saskatchewan system are organized into four carpentry trade specializations rather than one general carpentry occupation. It is



this organization of skills that is the main innovation of the Saskatchewan system and the main difference between this system and the Nova Scotia system.

## 8.2 Alberta<sup>29</sup>

A key reason for undertaking efforts to improve carpentry training in Alberta was an acute shortage of framers in the province. This shortage made it important to increase the supply of qualified trades workers through improvements in the training system.

A survey of 200 workers undertaken in 2000 revealed that the workers were resistant to apprenticeship training due to the generalized model of training while work requirements were specialized. This mismatch caused workers to question the relevance of apprenticeship training and resulted in resistance in participating in and completing apprenticeship. In response to this finding the Carma Centre began to examine the apprenticeship program for carpentry with the objective of designing a program that would be more relevant for workers.

The initiative of the Carma Centre took place at a time when the public school system in Alberta was implementing a Career Pathways model of education. A significant proportion of individuals working as carpenters (40%) received their carpentry training in high school. This program fit well with the initiative of the Carma Centre in terms of developing a career path for high school graduates.

The approach to training developed by the Carma Centre recognizes that youth do not see the trades as a long term career. It responds to this reality by developing a career path that begins with pre-employment training followed by training in technical skills in a specific trade specialty and progressing to providing skills needed to become a trades contractor. The concept behind this approach is that individuals entering training have the option to work within one of four carpentry trade specializations or to acquire training in all of the trade specialties and become a certified carpentry journey person.

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<sup>29</sup> The discussion in this section is based on an interview with the Executive Director of the Centre for Excellence in Home Building and Land Development (Carma Centre).



The first phase of the initiative of the Carma Centre dealt with the development of occupational descriptions for 48 newly defined occupations. This process began with the National Occupation Classification descriptions. Tasks and skills not appropriate to the occupations were removed and then industry input into the revised occupational descriptions was sought. Two to four representatives from industry sectors that were significant employers of the occupations were asked to review the revised occupational descriptions and provide their advice for further amendments. Revised occupational descriptions were developed with this input and these descriptions were reviewed by a group of industry leaders. The occupational descriptions were finalized with input from these groups.

Two occupational descriptions developed through this initiative were for a cribber contractor and framer contractor. A cribber undertakes formwork involved in assembling and constructing forms used to shape concrete into footings and the foundation of a house. A cribber contractor is an independent businessperson responsible for acquiring contractual agreements with home builders and for organizing, coordinating, and training people to provide the cribber services. The occupational description for a cribber contractor includes a career ladder with the following steps: (1) labourer, (2) 2nd hand cribber, (3) 1st hand cribber, (4) field supervisor and (5) cribber contractor.

A framer is a skilled craftsman who is responsible for building the structure of a building. A framing contractor is responsible for organizing, coordinating and training a team of people that are capable of providing a framing service. The occupational description for a framer contractor includes a career ladder with the following steps: (1) framer's helper, (2) framer, (3) lead framer and (4) framer contractor.

One key issue to be resolved is whether there should be a uniform standard for carpentry trades or whether employers should be permitted to train carpenters for specialty trades. Employers in the industry have differing views on whether individuals should be trained and certified in trade specialties or whether carpenters should receive a journeyman's certificate based on the completion of an apprenticeship program that includes all the Tasks, skills and Blocks included in NOA 1998. The position of the Carma Centre on this issue is that it does not favour one approach over the other but



believes that individuals should have the option of choosing certification in a specialized sub-trade of carpentry or in the conventional carpentry program as defined in NOA 1998.

The second phase of the initiative of the Carma Centre will be to develop training programs for the 48 trades. Curriculum development will not be an issue because the Alberta Apprenticeship and Industry Training Board has already developed a modular training program for carpenters that would support training and certification for the trade specialties defined by the Carma Centre.

## **8.3 British Columbia**

### **8.3.1 Organization of Skills**

The Canadian Home Builders' Association of British Columbia (CHBA-BC) is proposing a new training and certification model for carpentry.<sup>30</sup> The model separates carpentry training into four technical programs:

- ▲ Home Builder Forming Technician
- ▲ Home Builder Framing Technician
- ▲ Home Builder Interior Finishing Technician
- ▲ Home Builder Exterior Technician

The four technical programs are part of a career ladder developed for the home building industry that begins with home building entry skills and culminates with a home builder owner-operator.

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<sup>30</sup> This model is presented in the following documents: (1) "CHBA-BC Credential Submission to the Industry Training Authority of BC: Industry Training Authority Approval of a New Residential Construction Framing Technician Trade and Credential", Submitted by: The Canadian Home Builders' Association of BC, April 26, 2004; and (2) "RCFT Program Outline: Residential Construction Framing Technician", Developed by the Residential Construction Training Organization and the Canadian Home Builders' Association of BC, 2005.



The features of the BC model were described as follows in the CHBA-BC, April 26, 2004 document:<sup>31</sup>

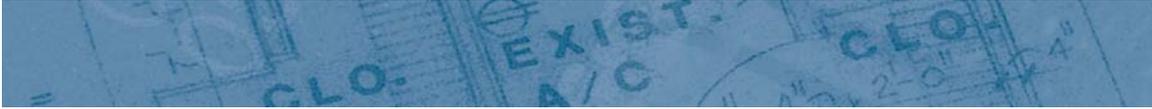
- ▲ *“Competency-based, modularized industry training and assessment training programs*
- ▲ *Reflects the reality of how work is organized and performed in the home building and renovation industry*
- ▲ *Provides more pathways for young people, unemployed persons and workers to advance within the industry and into broader traditional trades*
- ▲ *Reflects new home building and renovation technologies, materials, equipment, techniques and business models*
- ▲ *Bridging and laddering between various home building careers, with formal recognition and credentials for all training*
- ▲ *Access through multiple entry and exit points*
- ▲ *Skills and credentials that can be built on to move into new jobs – not simply a hierarchy, career progressions and training opportunities represent lateral moves (e.g. from one specialty occupation to another)*
- ▲ *Clear connections among new specialty occupations and existing trades*
- ▲ *New national standards will be developed that will dovetail with existing Red Seal standards”*

Additional features of the program are:<sup>32</sup>

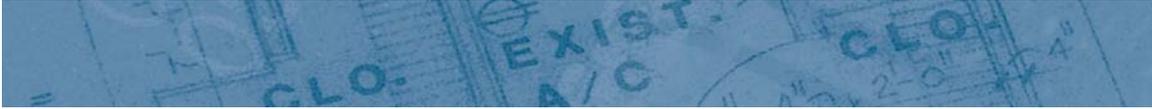
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<sup>31</sup> “CHBA-BC Credential Submission to the Industry Training Authority of BC: Industry Training Authority Approval of a New Residential Construction Framing Technician Trade and Credential”, Submitted by: The Canadian Home Builders’ Association of BC, April 26, 2004, pp. 9 & 10.

<sup>32</sup> Ibid, pp. 11-13.



- ▲ An expanded role for employers within the in-school training process – employers and employees in the home building sector had significant input into the development of a skills profile included in the various Blocks and Lines of the Framing Technician program.
- ▲ Hundreds of CHBA-BC member home building companies have expressed a commitment to hire and train Framing Technician participants. The Executive Director of the CHBA-BC indicated that under the program employers get skilled labour faster and the trainees have the on-the-job competencies required by employers. As a result, there is less onus on employers to provide basic on-the-job competencies.
- ▲ The CHBA-BC Training Accreditation Committee, made up of employers and chaired by a home builder/renovator establishes curriculum standards for the program.
- ▲ The CHBA-BC Training Accreditation Committee has provided interim accreditation for modules within the current carpentry curriculum in the province of BC.
- ▲ On-the-job training is designed to correspond directly to competencies taught in the in-school portion of the program.
- ▲ A redefinition of the in-school portion of training to focus on providing individual competencies leading to certification on a module by module basis.
- ▲ Credentials will not be awarded until individuals demonstrate competencies in the skills and knowledge covered within a specific competency.
- ▲ Individuals completing the Framing Technician program may complete additional sub-trade specialty programs and also may progress into the traditional carpentry program with some advanced credit. Individuals may ladder or bridge into existing trade programs.
- ▲ The CHBA-BC will work with training providers to pilot Workplace Assessor positions. The CHBA-BC and/or trainers will monitor on-the-job training and provide on-going support to employers.



- ▲ The Framing Technician program has multiple entry and exit points. Individuals can start at any of the three Blocks of in-school training included in the program depending on an assessment of their past learning.
- ▲ Workers will be able to move from one specialty sub-trade to another without having to repeat training. Previous training and learning will be recognized through competency-based assessments.
- ▲ Training for the specialty sub-trades will be directly linked to NOA 1998.

The four technical programs organize Tasks and skills into three levels: Blocks, Lines and Competencies. The Tasks and skills included in these levels have been fully developed for the Home Builder Framing Technician and will be described and analyzed in this report.

The Framing Technician program is comprised of three Blocks:

- ▲ Block 1: Residential Construction – Core Competencies
- ▲ Block 2: Residential Construction – Basic Framing Competencies
- ▲ Block 3: Residential Construction – Advanced Framing Competencies

Blocks are defined as groups of skills that meet employability requirements of employers in the residential construction industry. Individuals who successfully complete a Block receive a certificate that is recognized by employers in the home building industry.

The program is based on practical competency-based assessments built into each module (Block) during in-school training and at the end of the program (prior to certification).

Upon successful completion of all three Blocks and an assessment, trainees will receive an industry Framing Technician credential. Work is underway to have an Industry Training Authority (ITA) credential provided by the province of British Columbia.

The BC government supports the industry initiative and has set up Industry Training Organizations (ITOs) in Automotive, Horticulture and Residential Construction. This organization will define and



describe trade specializations from this point forward and play a leadership role in determining training needs in the Residential Construction sector. The ITO initiative was described as follows on the website for the Canadian Red Seal Program:

*“Underlying all of this is an ITA strategy to ensure that industry has a true leadership role in both training development and delivery. Based in part on highly successful models from other jurisdictions (most notably, New Zealand and Australia), the ITA is working with various industry sectors to launch Industry Training Organizations (ITOs), which will become the vehicles for industry engagement.*

*ITOs will be tasked with determining training requirements within their sectors, and with recommending program standards and training plans for approval and funding by the ITA. They will also play an important role in advising when, where and how training should be delivered, and an active role in promoting participation in industry training to both employers and prospective apprentices.”<sup>33</sup>*

The Blocks contain Lines that are comprised of competency groupings as depicted in Table 8.

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<sup>33</sup> See: [http://www.red-seal.ca/Site/products/spring05\\_news01\\_e.htm](http://www.red-seal.ca/Site/products/spring05_news01_e.htm).



**Table 8**

<b>FRAMING TECHNICIAN – BLOCKS AND LINES</b>	
<b>Blocks</b>	<b>Lines</b>
Block 1: Residential Construction – Core Competencies	Line A - Residential Construction Career Exploration Line B - Residential Construction Career Access Skills Line C - Residential Construction Equipment Certificates
Block 2: Residential Construction – Basic Framing Competencies	Line C - Residential Construction Equipment Certifications Line D - Drawings, Specifications and Layout Line E - Basic Residential Forming Line F - Constructing Residential Floors Line G - Constructing Residential Walls Line H - Constructing Residential Roofs Line I - Constructing Residential Stairs
Block 3: Residential Construction – Advanced Framing Competencies	Line D - Drawings, Specifications and Layout Line G - Constructing Residential Walls Line H - Constructing Residential Roofs Line J - Constructing Residential Stairs Line I - Installing Residential Windows and Doors Line K - Renovating Residential Buildings Line L - Residential Construction Building Science

Lines are comprised of competencies that must be obtained by trainees. Appendix 5 presents a Competency Profile Chart for Framing Technicians developed by the CHBA-BC. The chart shows the competencies that must be attained within each Line.

The CHBA-BC, April 26, 2004 document notes that on-the-job and classroom training can be provided in flexible combinations to provide the competencies included in each of the three Blocks of the Home Builder Framing Technician program. Successful attainment of competencies for each Block results in certification for each of the three Blocks of the Framing Technician program. All three certifications can be obtained in 38 to 52 weeks for an individual to become a Certified Residential Construction Framing Technician.



The Executive Director of the CHBA-BC indicates that the positive attitude of the provincial government towards industry involvement in training has been key to the implementation of the new training system in BC. The Executive Director described government support as “fantastic”. The support of the provincial government stems from a policy that training should be industry-led. This policy has enabled the process that resulted in the training system outlined above.

### **8.3.2 Description of Skills**

The CHBA-BC, April 26, 2004 document (page 16) states that:

*“Appendix D clearly shows how 52 of the 103 Carpentry modules in the provincial standard are covered by the proposed Framing Technician Program and new additional modules will be added. Additionally, there are 15 new Framing Technician competencies not directly covered in the Carpentry profile.”*

The fact that the Framing Technician Program covers approximately one-half of the carpentry modules is significant. The narrower focus of the program allows framers to complete their training more quickly and acquire the framing skills they need without having to acquire carpentry skills that are not related to framing.

The fifteen competencies included in the BC program but not in the carpentry profile are presented in Table 9.



**Table 9**

Introduction to Residential Construction Electrical
Introduction to Residential Construction Plumbing
Introduction to Residential Construction Carpentry
Introduction to Residential Construction Roofing
Introduction to Residential Construction Sheet Metal
Introduction to Residential Construction Mechanical (HVAC)
Level One First Aid
Install Roof Back – Framing
Use and Maintain Table Saws
Use and Maintain Radial Arm Saws
Use and Maintain Pneumatic Nailers and Staplers
Use and Maintain Power Actuated Tools
Use and Maintain Portable Electric Drills and Screwdrivers
Use and Maintain Reciprocating Saws
Use and Maintain Mitre and Chop Saws

The Executive Director of the CHBA-BC indicated that individuals are trained faster in the new system as a result of a shorter curriculum. The Executive Director also stated that there was less attrition in the new system and that students are taught in a more focused way. Another benefit of the new approach is that courses are more easily changed in response to changes in techniques and materials in the industry. In addition, trainees do not have to travel to the same degree as under the previous training system and their training costs are lower.



## 9.0 Conclusions

The purpose of the report is to provide an up-to-date analysis of the needs of the residential construction industry in Nova Scotia for skilled labour, and of the capacities of the formal training and apprenticeship systems to meet these needs. The most critical constraints are identified, and alternative approaches to labour force renewal are proposed.

This report has drawn upon the existing research literature, and on new research and consultations, to describe the residential construction labour force in Nova Scotia and the challenges associated with its ongoing development and renewal. The focus is on the largest and most critical element of this labour force – the carpentry occupation. Evidence is also brought to bear from parallel research and consultation activities in other Atlantic Provinces and in other regions of Canada.

The evidence presented in this report confirms that residential construction represents a distinct segment of the overall construction labour force. Approximately two-fifths of the total carpenter population works exclusively in the residential sector, while a slightly higher proportion works in both the residential and the industrial, commercial and institutional (ICI) construction sector depending upon job availability. The fact that over 80% of the total carpentry labour works all or some significant part of its time in the residential sector points to the need to expand training opportunities geared to residential construction in terms of both content and delivery methods.

The second important conclusion drawn by this study is that the shortage of skilled carpenters in the residential construction industry in Nova Scotia is already serious and will become much more so in the near future. Recruitment data indicate that current shortages could escalate dramatically in the future due to significantly reduced recruitment of young people into the trade over the past 10 to 15 years.

The third significant finding of this report is that conventional carpentry training and apprenticeship systems<sup>34</sup> do not at present have the capacity to meet the demand for skilled residential construction

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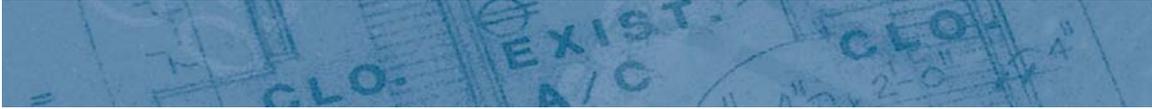
<sup>34</sup> A conventional carpentry training and apprenticeship system is one which provides a Certificate of Qualification in Carpentry for an individual who completes a given number of hours of training. In Nova Scotia it is 8,000 hours.



tradespersons. There are two aspects of this problem. First of all, there are simply not enough people entering and completing programs related to residential construction. Secondly, there continues to be a mismatch between the skills acquired in institutional training and the requirements of employers in the residential sector. As a result of these two factors, skills shortages are not being reduced in terms of either numbers of workers or the specific competencies of new entrants to the sector. There is substantial evidence that the current duration of training and apprenticeship programs limits the effectiveness of training and contributes to low completion rates for apprentice carpenters.

The three western provinces of Canada face critical carpenter shortages and have recognized that conventional carpentry training and apprenticeship programs are not able to overcome these challenges. They are developing innovative programs to produce larger numbers of qualified tradespersons with the specialized skills required in residential construction. Key features are:

- ▲ The creation of trade specializations that correspond to the four Blocks of NOA 1998:
  - Concrete Former;
  - Framers;
  - Exterior Finisher; and
  - Interior finisher.
- ▲ The development of occupational descriptions for these trade specializations based on industry requirements as specified by employers.
- ▲ The development of training and certification programs based on the occupational descriptions. These programs are still in development but key features that are emerging are:
  - Shorter periods of training which provide employer-recognized credentials for the attainment of competencies directly related to the requirements of employers in the residential construction industry;
  - Competency assessments;
  - Development of career ladders within the designated trade specializations;
  - Consistency with NOA 1998;



- Integration with existing carpentry apprenticeship programs; and
- Integration of training with hiring by employers in the residential construction industry.

The trades specialization approach offers potential advantages:

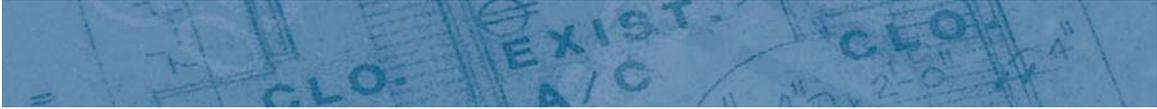
- ▲ Officials from the Western Provinces indicated that the development of career ladders was essential for increasing recruitment of young people to the trade. There is evidence that young people often do not think of carpentry as a long-term career choice but would be attracted by the prospect of a business career related to the trade.
- ▲ Providing trainees with competencies that make them employable at an early stage of their training may help to improve retention of young recruits while meeting employer requirements for new workers with job-ready skills.

A common feature of the training and accreditation systems emerging in Western Canada is that they are industry-driven. The residential construction industry played a leading and decisive role in the design of these systems with support from their respective provincial governments. Interviews with industry officials responsible for the development of the new systems in western Canada indicate that an industry-government partnership is a prerequisite for success.

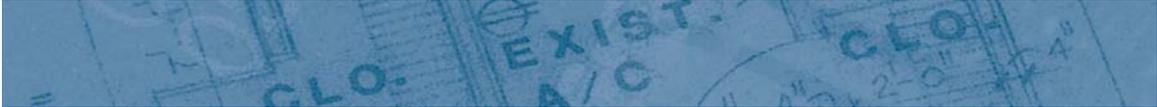
Although modular approaches are being developed in Western Canada, it cannot be concluded that conventional training and certification of journeyperson carpenters should be abandoned. There is ongoing debate about the merits of qualifying individuals for sub-sets of carpentry skills. Western Canadian officials interviewed for this study felt that a modular training system should be linked with the traditional apprenticeship training system. For example, an individual could become a certified journeyperson carpenter by acquiring certifications in all four of the trade specialization modules.

Efforts to improve carpentry training and apprenticeship should also incorporate the work on essential skills completed by the Construction Sector Council (CSC) and the Government of Canada.

The advantages of the new carpentry training systems being implemented in Western Canada, and under active consideration in Atlantic Canada, are a significant response to the recruitment and skills



shortage challenges in the residential construction industry. While the advantages are evident, the feasibility of these systems in a Nova Scotia context remains to be determined. Financial and administrative constraints limit the ability of the Nova Scotia carpentry training and apprenticeship systems to implement major innovations. In addition, research completed for this study suggests that more work needs to be done to establish the effective working relationships among industry, government and the training system that are a prerequisite for such innovations. Further research and consultations are required to identify changes to the current training and apprenticeship systems in Nova Scotia that are both beneficial and feasible.



## **Appendix 1 – Human Resource Problems Stemming from Training Systems in Atlantic Canada**

PRAXIS Research and Consulting Inc. completed a number of studies of human resource and labour supply issues in the construction and residential construction industries in Nova Scotia, Prince Edward Island and Newfoundland from 2001 to 2005. These studies show that recruitment and labour supply of trades workers and carpenters is a major problem in all three provinces and that the trades training systems contributed to these problems in all three provinces. The PRAXIS studies point to a need to restructure trades training in order to increase its ability to produce workers with the skills required by employers in a timely and cost effective manner.

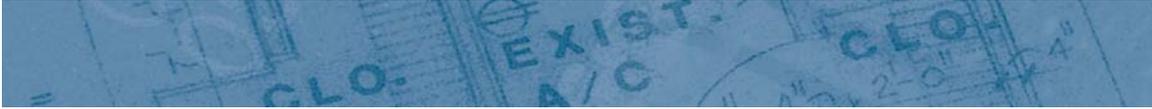
The findings and recommendations of the PRAXIS studies support the introduction of modular trades training with a high degree of input and direction from the residential construction industry. The ensuing sections of this appendix summarize the relevant findings from the PRAXIS studies in each province.

The western provinces of Canada are in the process of developing training systems designed to improve the efficiency and timeliness of carpentry training. The design and operation of the training systems in Saskatchewan, Alberta and British Columbia are reviewed in this report and the advantages of these systems in meeting the needs of both the trainees and residential construction industry are examined.

### ***Findings from Human Resource Studies in Nova Scotia***

PRAXIS completed a number of studies of the residential construction sector and carpenters between 2001 and 2004, including:

- ▲ Human Resources Sector Study for the New Home Building and Renovation Industry in Nova Scotia, Phases III and IV, March 31, 2001
- ▲ Report on Research and Consultations, Competency Based Assessment Framework for the Residential Construction Sector, March 2003



- ▲ Overview of Residential Building and Development and Its Workforce in Nova Scotia, March 2004
- ▲ Nova Scotia Carpenters EI Beneficiary Survey, June 2004
- ▲ A Study Of Worker Shortages & Surpluses In Nova Scotia, Findings Report, July 2004

Data on the age profile of carpenters shows that the number of carpenters under 25 years old declined from 845 in 1991 to 490 in 2001 – a decline of 42%.<sup>35</sup> The number of carpenters aged 25-34 dropped at an even steeper rate of 46% while the average age of carpenters in Nova Scotia rose from 37 in 1991 to 42 in 2001.

A survey completed for the March 2001 PRAXIS report found that 82% of employers felt that the residential construction industry in Nova Scotia was facing a shortage of finish carpenters while 52% felt that there was a shortage of framers. This survey confirmed findings from a 1999 Statistics Canada study that estimated that 68% of respondents in the residential construction industry in Nova Scotia felt that the industry was facing a shortage of skilled labour. Twenty-one percent of the employers in the PRAXIS survey attributed the shortages to a lack of appropriate training and cutbacks or lack of funding in schools.

The most frequently mentioned reason cited by employers in the survey completed for the March 2001 study was lack of a career path in residential construction which was mentioned by 20% of respondents. The March 2001 report concluded as follows:

*“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*

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<sup>35</sup> PRAXIS Research and Consulting Inc., “Overview of Residential Building and Development and Its Workforce in Nova Scotia”, March 2004, p. 27.



*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.”<sup>36</sup>*

Despite reports of shortages of finish carpenters and framers, the unemployment rate for carpenters recorded in the 2001 Census was 16% compared to approximately 9% for the Nova Scotia labour force as a whole.<sup>37</sup> The Census data also showed, however, that the Census unemployment rate for carpenters dropped from 29% in 1991 to the level of 16% recorded in 2001.

The July 2004 PRAXIS study entitled “A Study Of Worker Shortages & Surpluses In Nova Scotia, Findings Report” showed that there were approximately seven EI Claimants per job vacancy in Nova Scotia in 2002 – up from three EI Claimants per job vacancy in 1999.<sup>38</sup> These data point to a growing surplus of carpenters over the 1999-2002 period. The apparent paradox of employer-reported shortages of skilled carpenters and high levels of carpentry EI Claimants was summed up as follows:

*“Research conducted for this project provides evidence of significant problems in labour supply for both plumbers and carpenters. It was shown above that employers in the PRAXIS survey indicated that they were having difficulties finding workers with the skills and experience required to fill vacant positions. They also indicated that they did not feel that their labour supply problems were caused by a lack of bodies but by a lack of individuals with the skills and experience that were required on jobsites.”<sup>39</sup>*

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<sup>36</sup> PRAXIS Research and Consulting Inc., “Human Resources Sector Study for the New Home Building and Renovation Industry in Nova Scotia, Phases III and IV”, March 31, 2001, p. 31.

<sup>37</sup> PRAXIS Research and Consulting Inc., “Overview of Residential Building and Development and Its Workforce in Nova Scotia”, March 2004, pp.32-33.

<sup>38</sup> PRAXIS Research and Consulting Inc., “A Study of Worker Shortages & Surpluses in Nova Scotia, Findings Report”, July 2004, p. 19.

<sup>39</sup> Ibid, p. 35.



## ***Findings from a Human Resources Study of the Construction Industry on Prince Edward Island***

Studies completed by PRAXIS on the supply of carpenters conclude that recruitment into the occupation has declined precipitously since the early 1990s and that the collapse in recruitment will increasingly reduce the availability of labour in future years. For example, a study of the construction labour force on PEI showed that there were 53% fewer carpenters under 25 years old in 2001 compared to 1991.<sup>40</sup> The PEI report showed that a number of factors, including wages and seasonality of employment, contributed to the drop in recruitment:

*“A number of forces have contributed to the decline including changes in career preferences, public attitudes towards the trades, exposure to and experience with trades in high school, and increases in admission requirements for trades training. It was demonstrated in previous sections of this report that trades jobs are highly seasonal and wages have not kept pace with those in other industries.”<sup>41</sup>*

The study also showed that the number of certified trades workers on PEI declined significantly in recent years:

*“Conversely the proportion of 20-24 year olds with trade certificates declined from 3% (335) in 1986 to 1.2% in 2001 (105).”<sup>42</sup>*

The studies completed by PRAXIS showed that while employers experienced difficulties recruiting skilled trades workers, there were large numbers of unskilled (structurally) unemployed trades workers in the construction industry.

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<sup>40</sup> PRAXIS Research and Consulting Inc., “A Human Resources Study of the Construction Industry on Prince Edward Island, Findings and Policy Considerations, Final Draft - Full Report”, August 2004, p. 43.

<sup>41</sup> Ibid, p. 42.

<sup>42</sup> Ibid, p. 43.



Studies completed by PRAXIS indicate that the length of apprenticeship programs contributes to the recruitment and labour supply problems of the construction industry. As stated in the PEI study:

*“The length of time required to become certified in the trades may reduce the number of young people who enter and complete apprenticeship programs. The seasonal nature of employment means it can take over six years for an apprentice to become certified. Significant numbers of potential tradespeople drop out of the apprenticeship program because of their inability to find the steady employment required to complete their program. This problem reduces the production of skilled trades workers and contributes directly to structural unemployment.”<sup>43</sup>*

*“It appears, however, that the greatest constraint on supply may be the proportion of apprentices who complete their programs and the proportion of Holland College graduates who find direct employment in their trade.”<sup>44</sup>*

The study showed that withdrawals from the apprenticeship carpentry program on PEI were roughly 80% of completions between 1990 and 2001.<sup>45</sup> The PEI study concludes that:

*“Data on enrolments, withdrawals and completions indicates that attrition from the apprenticeship program may undermine efforts to reach the targets for producing certified tradespeople specified in the March 2002.”<sup>46</sup>*

A lack of experience with and knowledge of their chosen trade by entrants into institutional training was one of the reasons why completion rates for apprenticeship training were low.<sup>47</sup> Focus groups

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<sup>43</sup> Ibid, p. 52.

<sup>44</sup> Ibid, p. 62.

<sup>45</sup> Ibid, p. 65.

<sup>46</sup> Ibid, p. 66.



conducted for this study found that some graduates from classroom training were not hired by employers because of their lack of practical carpentry skills or “job readiness” in the words of employers.<sup>48</sup> The lack of job readiness was attributed to two problems with the training system: (1) inadequate integration of classroom training and work on job sites and (2) a lack of exposure to trades in high schools. The employer survey and focus groups conducted for the PEI study showed that the disconnect between institutional training and the on-the-job requirements of employers resulted in many employers in the industry not looking to the training system as a source of labour supply. Instead they hired workers that they felt had the right attitude towards work and provided practical training to these workers on-the-job. The paradigm for hiring and training in the construction industry on PEI is summed up in the following quotations:

*“The employer survey shows that most employers in the industry did not hire community college graduates in the last five years and that a minority of employees in many trades were certified. A relatively low proportion of employers rated Grade XII completion, post secondary trades training and trade certification as highly important in influencing hiring decisions. By contrast, positive attitudes and aptitudes were rated highly by the vast majority of employers. Focus groups indicate that employers often hire new entrants based on their attitudes and provide training for these individuals on-the-job.”<sup>49</sup>*

*“Employers who participated in the focus groups indicated that, when recruiting new entrants, most builders/contractors said that they tend to try to “grow their own”, that is, find someone such as a young labourer who seems to have the interest, aptitude and motivation, and encourage him toward skills development and training. They*

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<sup>47</sup> Ibid, p. 67.

<sup>48</sup> Ibid, p. 69.

<sup>49</sup> Ibid, p. 71.



*indicated that they do this as a solution of last resort and expressed a great deal of frustration with the current approach to the recruitment, screening and training of construction tradesmen.*<sup>50</sup>

The employer survey went on to show that training and certification were not important factors that influenced hiring decisions in the construction industry.

*“Training and certifications were among the lowest rated factors that influenced employers’ hiring decisions with 37% and 34% of employers respectively rating these factors as important or very important.”*<sup>51</sup>

The PEI study also found that telephone surveys with trades program graduates completed by Holland College indicate that roughly 50% of graduates from 1995 to 2001 were employed directly in their trade in the first full week of May following graduation.<sup>52</sup> These data point to problems with the integration of the classroom component of apprenticeship training and employment opportunities for individuals who complete classroom training. A significant proportion of individuals who complete classroom training in a specific trade do not find employment in that trade. The inability of individuals with classroom training in the trades to find jobs limits the supply of workers in that trade, contributes to the recruitment problems discussed above and undermines the pay-off of public investments in trades training.

The difficulties faced by individuals who complete classroom training in a specific trade in finding employment in that trade is perplexing given the documented difficulties of employers in the construction industry in finding skilled trades workers.

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<sup>50</sup> Ibid, p. 73.

<sup>51</sup> Ibid, p. 72.

<sup>52</sup> Ibid, p. 63.



Employers who participated in focus groups and the employer survey conducted for the PEI study provided advice on how to improve the relevance and effectiveness of trades training as summarized in the following quotation:

*“Employers feel that there should be a closer integration of institutional training and the workplace. In a practical sense, this would mean more time spent on job-sites by individuals enrolled in pre-apprenticeship training courses. The pay-off from closer integration would be an improvement in the job-readiness of graduates.”<sup>53</sup>*

In fact, more industry input into the training system, and more linkages of training with on-the-job experience, were the highest priority changes to the training system suggested by employers. The use of short training modules, updating curricula and more industry experience for trainers also were frequently mentioned as priorities.<sup>54</sup> Employers in the construction industry had the following suggestions for restructuring the trades training system:

*“Many builders and contractors who participated in the focus groups felt that a more formal relationship between industry and educational institutions was required to address some of the issues identified above. This relationship must go beyond industry providing feedback on program curricula and begin to look at ways to address some of the more fundamental training related issues in the industry.”<sup>55</sup>*

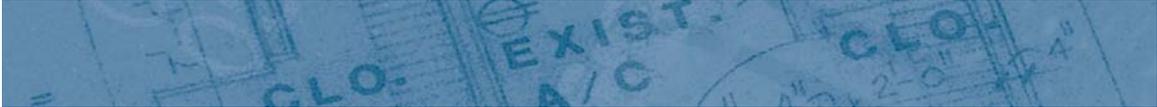
The study concluded that admission requirements for trades training may act as a barrier to individuals seeking a career in the trades.

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<sup>53</sup> Ibid, p. 79.

<sup>54</sup> Ibid, p. 80.

<sup>55</sup> Ibid, p. 81.



*“Admission requirements for trades programs at Holland College usually include Grade 12 and sometimes Grade 11 Math, English and Physics. These requirements may act as a significant barrier for prospective tradespeople.”<sup>56</sup>*

### **Findings from a Human Resources Study of the Home Building and Renovation Sector in Newfoundland and Labrador**

As in PEI, recruitment of carpenters in Newfoundland and Labrador (NL) declined precipitously since the early 1990s raising serious concerns about the future supply of workers in this trade. The situation was summed up as follows in a human resource study completed by PRAXIS:

*“The 1991 Census estimated that there were 550 carpenters under 25 years old in NL. By 2001 this number had declined to an estimated 165. The Census estimated that approximately 4% of the carpentry labour force was under 25 years of age in 2001 compared to 10% in 1991. By comparison, 14% of the labour force in all occupations in NL was under 25 years old in 2001.”<sup>57</sup>*

The NL study found that there was a disconnect between employers in the residential construction industry and training institutions and that this disconnect contributed to the recruitment problems for carpenters in the province.

*“A disconnect between employers and the institutional training system inhibits efforts to fill a training void that exists in the residential construction industry. The disconnect has contributed to a collapse in the recruitment of skilled workers into the*

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<sup>56</sup> *ibid.*, p. 67.

<sup>57</sup> The Atlantic Home Building and Renovation Sector Council and PRAXIS Research and Consulting Inc., “A Human Resources Study of the Home Building and Renovation Sector Summary Findings and Policy Implications for Newfoundland and Labrador”, May 2005, p. 2.



*industry in the last 10 – 15 years. The lack of recruitment could reduce labour supply to critical levels in the future and restrict the development of the industry.”<sup>58</sup>*

The study found that training institutions were not producing graduates who were job ready, that is, who could be immediately productive on job sites. Employers in the residential construction industry were reluctant to hire and provide training for workers without basic job readiness skills – including new graduates of training institutions. As a result, a void existed between training institutions and employers in the industry with a number of negative consequences including:

- ▲ Graduates from training institutions had difficulty finding employment in the residential construction industry.
- ▲ Employers had difficulty finding workers with the practical on-the-job skills that they required.
- ▲ Employers in the residential construction industry in NL were alienated from training institutions.

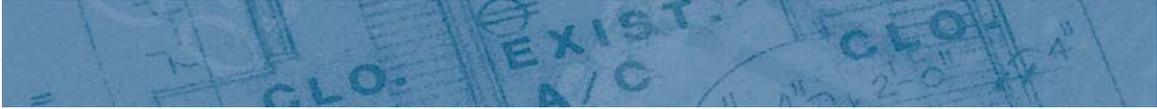
The NL study also found that the majority of skilled carpenters in the residential construction industry did not have a certificate of qualification. The study also found that a certificate was not a significant factor that influenced the hiring decisions of employers. The bottom line is that hiring and skills acquisition in the residential construction industry of NL operated largely outside the institutional training system.

An important policy implication of the NL study was summarized as follows:

*“The primary policy challenge faced by this study is to increase the proportion of new carpenters who enter and remain in the occupation. This challenge could be met by improving job readiness training for new entrants to the carpentry occupation. These*

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<sup>58</sup> Ibid, p. 3.



*improvements would increase the success of new entrants in finding and maintaining jobs in the residential construction industry.”<sup>59</sup>*

Four specific actions were recommended:<sup>60</sup>

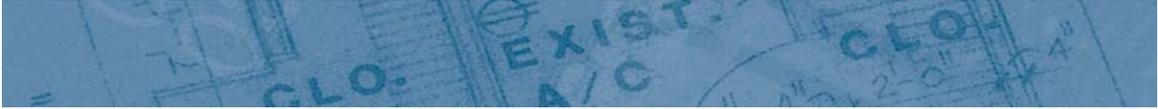
- ▲ Increased training support from employers.
- ▲ Improvements in the job-readiness of graduates of training institutions through the introduction of a significant on-the-job component into institutional training programs and the use of modular training to impart the specific skills needed to improve the job readiness of trainees.
- ▲ An employer based placement system to link new entrants, especially graduates from training institutions, into the hiring processes of the industry.
- ▲ The provision of more information on and exposure to the trades in high schools.

An overriding policy recommendation of the NL study was the development of a greater level of integration between employers and training institutions with the objective of increasing recruitment in the residential construction industry.

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<sup>59</sup> Ibid, p. 9.

<sup>60</sup> Ibid, p. 10.



## **Appendix 2 – Skills Included in the Carpentry Certificate Program of the Nova Scotia Community College**

1. Recognize unsafe conditions in the workplace and work safely.
2. Demonstrate correct use of power tools and shop equipment.
3. Select and demonstrate use of portable power tools.
4. Select and demonstrate use of stationary power tools.
5. Interpret the National Building Code as it applies to the residential construction industry.
6. Read and interpret residential construction drawings.
7. Sketch basic diagrams in orthographic and isometric views.
8. Perform basic site layout.
9. Construct footings of various designs.
10. Identify foundation wall systems.
11. Construct and install beams and columns.
12. Lay out and frame joists and headers.
13. Install sills, bridging, and sub-flooring.
14. Lay out, frame, and erect load and non-load bearing walls.
15. Construct and install lintels, backing, and bracing.

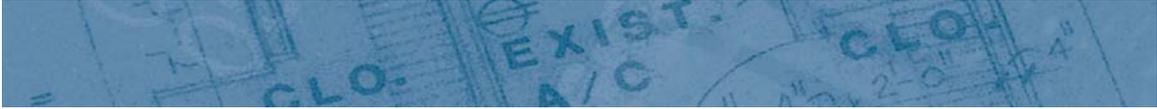


16. Apply various types of sheathing.
17. Layout and erect common roofs.
18. Install cornices and roof trim.
19. Lay common asphalt roof coverings.
20. Describe and apply building science principles related to construction.
21. Utilize trade specific mathematics for construction.
22. Describe and apply window and door units.

#### Employability Skills

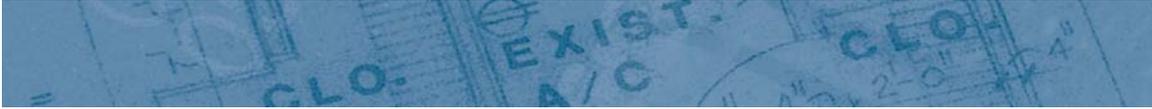
1. Apply appropriate thinking skills and strategies that will facilitate decision making and problem solving.
2. Define business organizations, assess entrepreneurship skills, and resources required to develop a business.
3. Identify and develop effective communication techniques and the skills necessary to build and improve relationships with others and produce job search documents such as a résumé.
4. Use computer systems and basic operating systems to create documents, record storage, and Computer Aided Drafting as it relates to the Carpentry Program.
5. Define roles and responsibilities in the workplace, evaluate workplace situations and behaviours, and interact effectively with coworkers, supervisors, and clients.
6. Apply mathematical concepts and techniques with the degree of accuracy required to solve problems and make decisions.
7. Apply a portfolio approach to the personal management of learning, career planning and job search.

A more detailed description of skills is included in each respective course description.



## **Appendix 3 – Skills Included in the Carpentry Diploma Program of the Nova Scotia Community College**

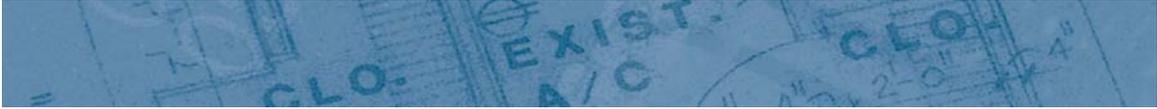
1. Work safely and recognize unsafe conditions in the workplace.
2. Select and demonstrate use of power tools and shop equipment.
3. Select and demonstrate use of portable power tools.
4. Select and demonstrate use of stationary power tools.
5. Interpret the National Building Code as it applies to the residential construction industry.
6. Read and interpret residential construction drawings.
7. Sketch basic diagrams in orthographic and isometric views.
8. Perform basic site layout.
9. Construct footings of various designs.
10. Identify foundation wall systems.
11. Construct and install beams and columns.
12. Lay out and frame joists and headers.
13. Install sills, bridging, and sub-flooring.
14. Lay out, frame, and erect load-bearing and non-load bearing walls.
15. Construct and install lintels, backing, and bracing.



16. Apply various types of sheathing.
17. Lay out and erect common roofs.
18. Install exterior trim.
19. Install siding and cladding.
20. Lay common asphalt roof coverings.
21. Describe and apply building science principles related to construction.
22. Apply trade specific mathematics for construction.
23. Install window and door units.
24. Build and install common stairs.
25. Install basic types of interior trim.

#### Employability Skills

1. Apply appropriate thinking skills and strategies that will facilitate decision making and problem solving.
2. Define business organizations, assess entrepreneurship skills, and resources required to develop a business.
3. Identify and develop effective communication techniques and the skills necessary to build and improve relationships with others and produce job search documents such as a résumé.
4. Use computer systems and basic operating systems to create documents, record storage, and Computer Aided Drafting as it relates to the Carpentry Program.



5. Define roles and responsibilities in the workplace, evaluate workplace situations and behaviours, and interact effectively with co-workers, supervisors, and clients.
6. Apply mathematical concepts and techniques with the degree of accuracy required to solve problems and make decisions.
7. Apply a portfolio approach to the personal management of learning, career planning and job search.



## Appendix 4 – Comparison of the Saskatchewan Occupational Descriptions to NOA 1998 for Carpentry

Table 7 of the main text compares the Tasks for framers in the Saskatchewan system to those in NOA 1998 for the carpentry trade. This table is reproduced here to facilitate a comparison of the two systems.

<b>Occupational Analysis for Framers</b>	
<b>Saskatchewan</b>	<b>NOA 1998</b>
<b>Occupational Skills (Block A)</b>	<b>Occupational Skills (Block A)</b>
- Task 1 - Uses tools and equipment	- Task 1 - Uses tools, equipment and material
- Task 2 - Uses building materials	
- Task 3 - Interprets construction documents	- Task 2 - Uses contract documents
- Task 4 - Performs project related skills	- Task 3 - Performs project related skills
<b>Framing (Block B)</b>	<b>Framing (Block C)</b>
- Task 5 – Lays out framing systems	- Task 7 – Installs framing systems
- Task 6 – Constructs framing systems	- Task 8 – Installs sheathing
- Task 7 – Installs exterior doors	

Sources: “Framer - Subtrade of Carpenter”, Provincial Occupational Analysis, Draft #2, Saskatchewan, 2005 and “Occupational Analyses Series – Carpenter”, HRSDC, 1998

The table shows that two of the Tasks included in the Saskatchewan system, Task 2 - Uses Building Materials and Task 7 – Installs Exterior Doors, are not included within the Framing Block of the NOA 1998 system.

Task 7 in the Saskatchewan system corresponds to Task 9 – Installs Doors and Windows which is in Block D (Exterior) of NOA 1998. The HRSDC system does not organize the Sub-tasks and Supporting Knowledge and Abilities (skills) involved in using building materials into a distinct Task. Instead, it groups the Supporting Knowledge and Abilities (skills) involved in using building materials under Sub-task 1.06 (Installs Building Materials) within Task 1 - Uses Tools and Equipment.

Another difference in the way the occupational analysis systems deal with Tasks relates to framing systems. The Saskatchewan document has two Tasks pertaining to framing systems: (1) lay out (Task



5) and (2) construction (Task 6) of framing systems. The HRSDC, 1998 document also has two Tasks but uses different terminology to describe them, namely: (1) installation of framing systems (Task 7) and (2) installation of sheathing. A comparison of the Sub-tasks and Supporting Knowledge and Abilities (skills) involved in these Tasks is undertaken later in this report.

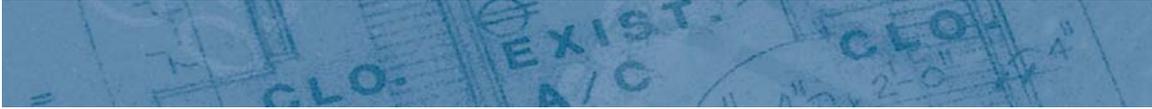
The remaining five Tasks in the Saskatchewan system correspond to those in the HRSDC system although there are some obvious differences. A detailed comparison of the Saskatchewan system to NOA 1998 for the carpentry occupation on a Sub-task and skill basis is presented in the remainder of this Appendix.

Skills correspond to Supporting Knowledge and Abilities in both the NOA 1998 and Saskatchewan systems and Supporting Knowledge and Abilities are included within Sub-tasks in both systems. In order to understand the relationship between skills in both systems, it is necessary to understand the relationship between Sub-tasks.

### **Sub-task Comparison**

An associated paper completed for this study provides a detailed comparison of the two systems at the Sub-task and Supporting Knowledge and Abilities levels. Analysis of the Sub-tasks in both systems shows that they are for the most part very similar. The main differences relate to the placement of Sub-tasks within Blocks and Tasks rather than in the specification of Sub-tasks. The paper shows the following differences at the Sub-task level:

- ▲ The HRSDC system does not organize the Sub-tasks and Supporting Knowledge and Abilities (skills) involved in using building materials into a distinct Task. Instead, it groups the Supporting Knowledge and Abilities (skills) involved in using building materials under Sub-task 1.06 (Installs Building Materials) within Task 1 - Uses Tools and Equipment.
- ▲ In some cases, Sub-tasks in the Saskatchewan system correspond to Supporting Knowledge and Abilities in the NOA 1998 system. For example, Sub-task 3.03 (Estimates materials) of the Saskatchewan system has no correspondence in NOA 1998. It does, however,



correspond to a number of skills (Supporting Knowledge & Abilities) in Task 3 (Performs project related skills), Task 7 (Installs framing systems) and Task 8 (Installs sheathing) of the HRSDC document. Tasks 7 and 8 are components of the Framing Block (Block C) in the HRSDC system.

A number of Sub-tasks in the Saskatchewan system have no correspondence in the Sub-tasks and skills specified in the NOA 1998 system. For example, there is no correspondence in the NOA 1998 system for Sub-tasks 3.04 (Schedules work sequence), Sub-task 4.01 (Performs site layout) and Sub-task 5.04 (Lays out stairs) in the Saskatchewan system.

- ▲ A number of Sub-tasks in the NOA 1998 system have no correspondence in the Sub-tasks and skills specified in the Saskatchewan system. For example, there is no correspondence in the Saskatchewan system for Sub-tasks 3.03 (Performs quantity take-offs) in the NOA 1998 system.

### **Supporting Knowledge and Abilities (Skills) Comparison**

The background paper comparing the Saskatchewan and NOA 1998 systems shows that the Supporting Knowledge and Abilities (skills) are for the most part very similar. The main differences relate to the placement of Supporting Knowledge and Abilities (skills) within Blocks, Tasks and Sub-tasks rather than in the specification of Supporting Knowledge and Abilities (skills). The following differences at the knowledge and skills level are documented in the paper:

- ▲ Some Supporting Knowledge and Abilities (skills) found in the Saskatchewan system have no counterpart in NOA 1998. For example, some skills found in Sub-task 1.02 (Uses portable power tools) of Task 1 of the Saskatchewan system have no counterpart in NOA 1998. These skills are illustrated in the following table:

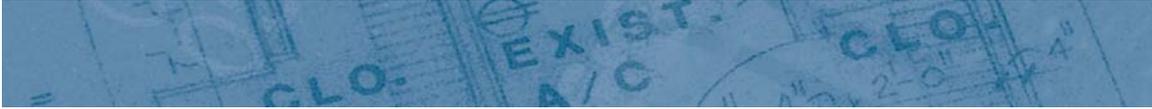


**Table 10**

SASKATCHEWAN, 2005 SYSTEM	
1.02.02	Knowledge of types and uses of blades, bits and grits
1.02.03	Knowledge of types of pneumatic powered portable power tools such as framing nailers and brad nailers
1.02.08	Knowledge of manufacturers' specifications
1.02.09	Ability to recognize hazards such as worn cords, leaking hoses and dull blades
1.02.10	Ability to select and install blades bits and grits appropriate to specific tasks
1.02.12	Ability to shut down, dismantle and store portable power tools

Another example relates to the task of using power tools: Supporting Knowledge and Abilities (skills) 1.03.02 (Knowledge of manufacturers' specifications), 1.03.03 (Ability to recognize hazards such as worn cords, leaking hoses and dull blades) and 1.03.05 (Ability to shut down, dismantle and store portable power tools) in the Saskatchewan system are not found in the HRSDC system. Other examples of significance are:

- The Saskatchewan system identifies Supporting Knowledge and Abilities (skills) associated with applications of the various types of building materials. There are no corresponding Supporting Knowledge and Abilities (skills) identified in NOA 1998.
- The Saskatchewan system identifies a Supporting Knowledge and Ability (skill) associated with knowing the problems related to installing fasteners, adhesives and connectors such as moisture, pressure and wind loads. There is no corresponding Supporting Knowledge and Ability (skill) in NOA 1998.
- The Saskatchewan system identifies Supporting Knowledge and Abilities (skills) associated with knowledge of properties associated with the various types of building materials. Properties include: composition, moisture content, sizing and strength. There are no corresponding Supporting Knowledge and Abilities (skills) in NOA 1998.



- The Saskatchewan system identifies Supporting Knowledge and Abilities (skills) associated with assessing the condition, quality or grade of structural and non-structural materials. There are no corresponding Supporting Knowledge and Abilities (skills) in NOA 1998.
- ▲ Some Supporting Knowledge and Abilities (skills) found in the NOA 1998 system have no counterpart in the Saskatchewan system. For example, the Supporting Knowledge and Ability 1.02.07 (Ability to use routers and laminate trimmers) in the HRSDC system is not listed in the Saskatchewan system.

There are no corresponding Supporting Knowledge and Abilities (skills) in the Saskatchewan system for the following Supporting Knowledge and Abilities (skills) listed under Sub-task 1.06 of NOA 1998:

- 1.06.05 (Knowledge of mechanical ventilation);
- 1.06.09 (Knowledge of different concrete additives); and
- 1.06.13 (Ability to install ventilation systems).
- ▲ There are some significant wording differences in the Supporting Knowledge and Abilities (skills) found in both systems. An example is provided in the following table:

**Table 11**

<b>SASKATCHEWAN, 2005 SYSTEM</b>		<b>NOA 1998</b>	
1.04.02	Knowledge of survey tools such as levels and plumb bobs	1.05.04	Ability to use water, hand, laser and builders levels
1.04.03	Knowledge of survey instruments such as builders levels, transits, theodolites, and total station	1.05.05	Ability to use a theodolite, transits, distometers and total station



## Appendix 5 – CHBA-BC Residential Construction Framing Technician Competency Profile Chart – June 30, 2005

### Block 1: Residential Construction – Core Competencies

Residential Construction Career Exploration	Describe work performed by framing technicians	Describe the construction industry structure	Use standard industry terminology	Describe residential construction trades			
Residential Construction Career Access Skills	Obtain Level One First Aid Certification	Describe Workplace Hazardous Materials Information System (WHMIS)	Perform Basic Construction Calculations	Perform Basic Blueprint Reading	Use Safe Work Practices	Work Safety Around Material Handling Vehicles	Explain WCB Construction Regulations
Residential Construction Equipment Certificates	Use and Maintain Hand Tools and Measuring Devices	Use and Maintain Circular Saws and Saw Blades	Use Ladders and Scaffolds	Use and Maintain Chain Saws	Use and Maintain Portable Generators	Use and maintain portable electric drills and screwdrivers	Use and maintain reciprocating saws



## Block 2: Residential Construction – Basic Framing Competencies

Residential Construction Equipment Certifications	Use and maintain table saws	Use and maintain pneumatic nailers and squares	Use and maintain mitre and chop saws	Use and maintain radial arm and/or sliding mitre saws	Use and maintain powder actuated tools	Use and maintain laser and builders levels
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Drawings, Specifications and Layout	Read construction drawings and specifications	Identify material types and quantities
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Basic Residential Forming	Install Footings	Install foundation wall	Install form for flatwork	Install formwork for columns
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Constructing Residential Floors	Assemble sill plate	Assemble floor system	Assemble decks
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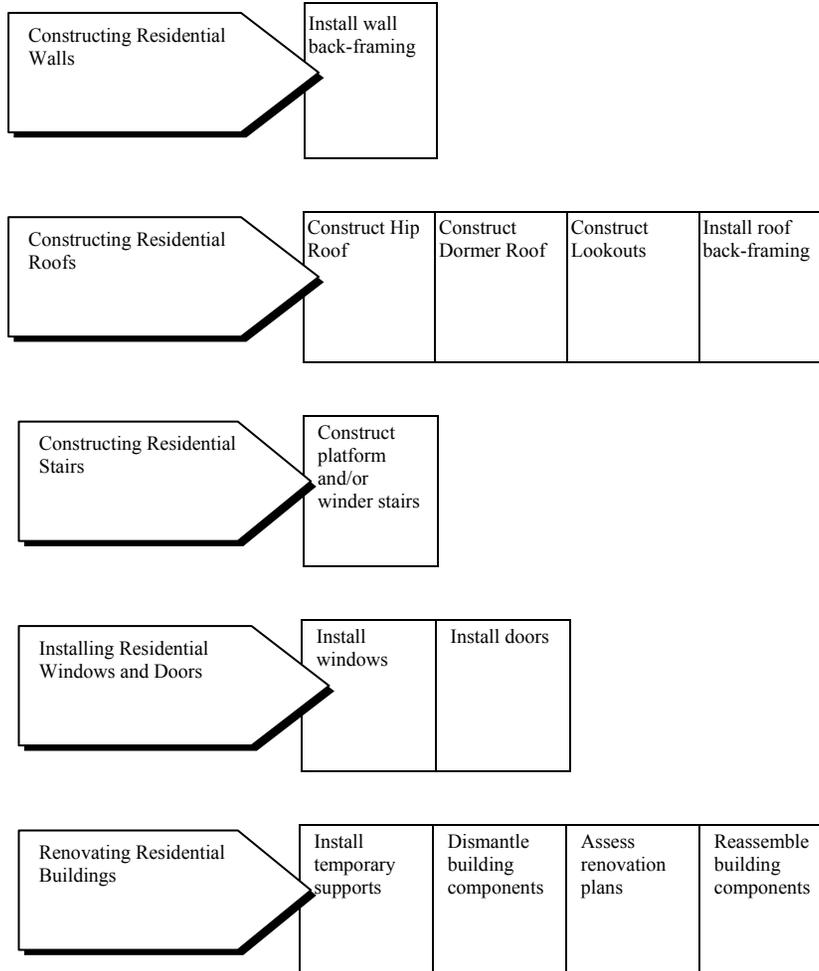
Constructing Residential Walls	Construct exterior walls	Install posts and beams	Construct interior walls
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Constructing Residential Roofs	Construct roof joist system	Construct gable roof	Install strapping and sheathing	Install pre-fabricated trusses
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Constructing Residential Stairs	Construct straight stairs
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### Block 3: Residential Construction – Advanced Framing Competencies

Drawings, Specifications and Layout	Identify building codes and bylaws
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Residential Construction Building Science	Explain the forces acting on a building	Explain heat and sound transfer principals	Explain air, moisture movement in building	Explain methods for controlling the forces acting on a building	Explain methods of controlling heat and sound transmission	Explain methods of controlling air and moisture flow
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