

Sheet Metal and Roofing Human Resources Analysis – Roofing Final Report - Executive Summary

1. Introduction

New materials, information and technology are changing patterns of work in the construction industry. Computers control highly customized work tasks previously executed by both unskilled and skilled workers. Information technology allows better and faster design, retooling, inventory control and product delivery. Flexible and customized manufacturing processes in capital-intensive factories produce both standardized and one-off goods, replacing the mass production of identical products.

These changes are directly affecting the roofing industry. New materials and technologies are replacing some traditional craft methods of work. New tools, materials and processes appear, disappear and reappear. Regulations initially impede and then facilitate change. The risks involved in decision making related to new systems, products and partners are significant: the right choice can present tremendous business opportunities, the wrong choice can be disastrous.

Compounding these challenges, a serious decline in labour demand began in 1990 and a dramatic shift in demographics is increasing the average age of the work force. Government policy is also creating difficulties as cuts to capital budgets reduce work and smaller training budgets discourage new entrants to the trade. As a result, extensive structural unemployment is placing considerable pressure on public social programs, while at the same time, ironically, employers cannot find workers with the skills needed for the new era of construction.

In this context, Human Resources Development Canada (HRDC) has offered assistance to the industry through sectoral councils and National Sector Adjustment Services (NSAS) committees. The Sheet Metal and Roofing Trades National Sector Study Committee was created with representation from all provinces and trades, and includes the Sheet Metal Workers International Association, the Canadian Roofing Contractors Association (CRCA) and the Sheet Metal Association of Contractors in North America (SMACNA). This Committee approached HRDC with a request to undertake a labour market analysis for their trades, in 1996. This report, prepared by The ARA Consulting Group Inc., and its associates, represents the results of that analysis.

The objective of the work is:

“...to provide a guide for training and labour force development and adjustment over the next decade for the sheet metal and roofing trades in Canada. The study will determine the requirements from the trades for put in place construction and maintenance and the new skills that are expected to come into demand over the period as a result of technological change. These estimates will be compared to the size of the existing trades

work force and its skills attributes to determine the training needs of the sheet metal and roofing sector over the period.”

This report presents conclusions and recommendations for consideration by the Sheet Metal and Roofing Trades National Sector Study Committee. Further reviews and validation discussions are planned so that a broad cross-section of the industry will have an opportunity to comment on these ideas. However, certain highlights and recommendations are apparent and are presented in this Executive Summary.

The ARA Consulting Group Inc. would like to acknowledge the assistance of the members of the National Sector Study Committee, the Steering Committee and the many survey respondents and participants in provincial advisory groups, focus groups and related interviews. This report is essentially a summary of their views and contributions.

2. Industry Overview

There are two distinct segments in the roofing industry. Low slope roofing systems are used chiefly in high rise residential and Industrial, Commercial and Institutional (ICI) construction. Steep slope roofing (i.e., asphalt or cedar shingling) predominates in low-rise residential construction. In both segments of the industry, demand is driven by new construction and the need to replace existing roofs.

The roofing industry comprises approximately 18,000 persons, employed as journeypersons, supervisors, owner-operators, apprentices and helpers. Of these, in 1996, approximately 11,000-12,000 workers worked exclusively or chiefly in the installation of various low slope roofing systems. Another 6,000-8,000 workers worked as asphalt or cedar shinglers in the steep slope sector. Approximately 40% of workers in the low slope sector also work in shingling.

The scale of work tends to be small — workers spend short periods on a job and contractors/installers operate with very small staff and limited resources. There are many players in this complex industry — roofing material suppliers, unions, owner/clients, general contractors, government regulators and inspectors — experience is essential and the competition is unforgiving.

There is evidence of specialization by contractors and an associated consolidation especially in larger markets. Contractor/installers develop strategic alliances with material suppliers and the combined operation grows to a critical size; serving a large market area. This shift in industry structure seems to be focused in single ply systems. If this process of specialization and consolidation continues and spreads to other types of roofing, workers may become more specialized with fewer opportunities for training and work experience involving a variety of roofing materials.

Another harsh reality that challenges both contractors and workers is the underground economy in construction that consists of many illegal and improper practices undermining the entire construction industry and the roofing trade. These practices include: accepting cash, “straight cheque” or any other payments that escapes the taxes and charges that are normally applied to construction compensation. Other practices seek to reduce the cost of construction by cutting corners or avoiding regulations.

Contractors can be categorized along lines similar to the work force — between residential shinglers and industrial, commercial and institutional (ICI) roofers. The industry is made up of small firms — but the average size of the shinglers is well below four workers. This suggests an entire industry of owner/operators that have a limited management structure, financial backing or capacity for training.

The roofing industry is subject to marked seasonal fluctuations. Overall, seasonal fluctuations in employment are greater in the roofing industry than in construction as a whole. There is, however, somewhat less fluctuation in roofing work over the economic cycle than in construction as a whole. This is largely attributable to the demand for re-roofing and for repair work which is less volatile than the demand for new construction.

Except in periods of a severe industry downturn, the roofing industry operates at virtually full employment capacity during the summer months. During the winter, unemployment typically exceeds 50%. Cyclical unemployment doubled from under 20% to nearly 40% during the boom-bust in the late 1980s. These conditions have a major impact on human resource management and labour market conditions. Individual employers have limited incentive or resources for training or long term human resource development. Mobility of the workforce and training needs have created a natural role for unions and construction relies on the unionized industry that has recruited, trained and mobilized the workforce for decades. In spite of this natural advantage, unionized firms have been losing share in recent years. Industry conditions also act to discourage new entrants and often “push” workers out of the trades or construction altogether. Overall construction is a unique and challenging environment for human resource development.

An important finding of the study is the high degree of both short-term and long-term inter-provincial mobility of labour. A key conclusion, therefore, is that a continuation of uncoordinated and disparate provincial regulation will weaken the industry by impeding the development of a mobile, skilled labour force. Almost one quarter of the workforce move among provinces seeking work and more would likely benefit if barriers were reduced. Everyone benefits if workers can increase their utilization by increased mobility — incomes rise, productivity increases and skills are used more effectively. Finally, a national or continental job market would encourage shared training facilities, equipment, teachers, curriculum and certification. Training costs are rising as available resources are declining. Sharing training costs across a larger workforce will save needed resources.

3. Technological Change

Currently evolving technology brings better weatherability, installation, improved membrane materials and aesthetics to roofing systems. The increasing efficiency of roofing systems also reduces maintenance costs. There are many large and small examples of new products and applications, but for the most part these changes are not major leaps forward. Rather, they are incremental to existing approaches and unfold over extended periods of time. Roofing manufacturers are responding to the needs of end-users with increasingly durable and efficient roofing products. With diligent planning and an understanding of specific systems, facilities professionals can realize long-term performance for their roofs.

The increasing emphasis on the durability, life-cycle costs, and energy savings of roofing systems is causing the industry to review existing approaches, in the context of the efficient use of natural resources. In some instances, industry is adopting completely new techniques or reintroducing “old” techniques which may have been too expensive in the past, but, have recently become viable because of total cost considerations over the service life of the roof.

Roofing materials and systems may not change “dramatically” in the future, but, there will be significant efforts to improve performance, reduce costs and mitigate environmental impact. There will also be a movement to the development of “high performance roof systems” — roofs with increased wind and fire resistance, longer service life, lower life cycle costs and improved energy efficiency. Most industry sources indicate that it is in the warranty-related areas that technological improvements and innovation are likely. Technology change will also include new products and methods, improved specification manuals, and more rigorous specification of products. Perhaps the most important trend on the horizon is the emergence of sustainable roofing and green buildings which will force, albeit in a subtle manner, innovative ways of installing new roofs and repairing/recovering old ones. It is in this latter activity that workforce changes, in demand and skills, are most likely.

Technological change, while slow, has the potential to exacerbate the problems of an already unstable diverse and fragmented roofing industry. The industry has a poor image due to litigation, premature roof replacements, and poor installation practices. The current roofing industry is largely driven by marketing and sales; product is marketed using “data” (raw numbers regarding material properties) rather than “information” (which leads to a decision). It is also an industry that relies heavily on specifications and awards projects based on “lowest-cost” because it is assumed that all contractors can perform to the same level of performance. This means that manufacturers “push” the advancement of technology by developing new products which can be promoted as having better properties in order to gain a marketing edge over competitors. There is some “pull” from builders and owners but, they are not motivated by technology change per se, rather they are primarily interested in roof systems which: do not leak, have an extended performance period, involve minimal maintenance and repair, perform in adverse environmental conditions (weather, number of penetrations, traffic, and chemical exposure) and involve the lowest installation cost.

The net effect of technological advancements and the developing structure of the industry on labour specific skill requirements is gradual over time, but significant. There will likely be a two or three tier workforce. At one level, the general roofing contractor segment will be characterized by a stable, relatively well-rounded and reasonably skilled workers. The diversity of jobs and work sites, in addition to the complexities of renovation work which involves many unforeseen circumstances, requires that workers be steeped in traditional skills, experienced with many different types of materials and capable of solving problems as they arise. At the second level, the specialty and large commercial contractors will have fewer fixed employees, but a large group of workers who have been trained to perform one or two relatively simple, repetitive tasks (such as welding seams, spraying a foam mixture or mechanically fastening the roof down give it more structural integrity), but lack understanding of the

underlying roofing system principles. The activities of these workers will be directed by a few skilled/trained supervisors.

4. Contractors

In order to investigate the state of contractor related issues, six focus groups were organized in British Columbia, Alberta, Manitoba, Ontario, Quebec and with the National Board of Directors of Canadian Roofing Contractors Association. Fifty contractors, representing both the organized and unorganized sectors of the industry participated in the process.

In the larger markets (B.C., Ontario, and Quebec) there is a growing trend for manufacturers of roofing materials to play a larger role in the industry. Manufacturers certify certain contractors (by training their workers) as installers for their product/systems. The manufacturer in some cases works closely with the contractor in bidding jobs, and carries out some of the sales functions. Firms which are not certified are blocked out of the market, although in some cases if they win a large job, the manufacturer will give them a “quickie certification”.

According to contractors, the key trends in the roofing industry that will have ongoing impact on demand for skills and training are:

- ❑ *Innovation in Materials and Applications*: ongoing change requires a workforce that is constantly being upgraded in the latest materials and procedures. This puts much greater emphasis on journeyman training than apprenticeship;
- ❑ *Strategic Relationships Between Manufacturers of Roofing Materials and Contractors*: this trend gives manufacturers control over market entry. This limits some contractors as to the work that they can bid. It also results in more specialized contractors which, subsequently, narrows the range of skills that workers require;
- ❑ *Increasing Specialization of Contractors in Larger Markets*: in some markets contractors choose to specialize in one or two roofing materials. Workers with one or two materials cannot easily transfer those skills to another type of material; and
- ❑ *Manufacturers Play a Role in Training and Certification of Contractors*: this impacts on the structure of the market. However, there is disagreement about whether manufacturers offer the best training or if it should be a supplement to a regular apprenticeship program.

5. The Workforce

As part of this study, a survey was undertaken of the demographic characteristics, employment patterns and skills of the roofing industry work force. Participation in the survey comprised almost entirely workers who are employed by companies that operate either primarily or solely in the low-slope sector. The Worker Survey does not provide, therefore, information on the demographics and skills of individuals who work only in the asphalt shingle segment of the market.

The results of the survey are summarized as follows:

Demographics

- ❑ Average Age: Total Industry – 33; Low-Scope Roofing Only – 38.
- ❑ Steep-slope roofing is a young worker’s industry. There is a high rate of exit from this industry after age 35. In low-slope roofing, this high exit rate occurs after age 45.
- ❑ The industry is challenged by exceptionally high exit rate, compared to construction as a whole. The industry requires a human resource strategy that will both reduce this exit rate and also allocate scarce training resources in a manner which is most efficient in light of exit patterns within the industry.

Education

- ❑ Low levels of formal schooling are common. Basic skills weaknesses (reading, communications, trade math) are likely to be widespread.

Apprenticeship and Certification

- ❑ The incidence of trade certification varies radically across provinces. This is attributable to differences among provinces in the regulation of the trade. In Ontario, 60% of the industry work force are not certified.

Occupational Structure

- ❑ In provinces where certification is voluntary, the industry’s occupational requirements are for: journeypersons to function as crew leaders and assistant crew leaders (30%), apprentices (10%), non-certified, material handlers (50%) and trainee/helpers (10%).
- ❑ This model will provide an occupational ladder that may reduce industry turn-over. More important, this model will assist the industry in allocating its scarce training resources in the most efficient manner.
- ❑ Structuring occupations along these lines will maximize the industry’s return to training investments by allocating training resources roughly in proportion to propensity to remain working in the roofing industry.
- ❑ In provinces where certification is mandatory, the key issues are the appropriate ratio between journeypersons and apprentices and managing apprentice entry and training so as to keep attrition within construction industry norms.

Employer-Based/Sponsored Training

- ❑ The roofing industry is distinctive in the importance of proprietary materials, methods and systems. It is essential to bring manufacturers of roofing systems to the training table and to track, certify and monitor training in proprietary roofing systems.

Employment Trends

- ❑ In the medium term, increases in the demand for labour can be met without increasing the absolute size of the industry work force. New entrant intake should be approximately 6% in relation to an estimated annual exit rate of 7%.
- ❑ 2/3 to 3/4 of industry members worked for only one contractor during the past twelve months. This is consistent with the prevalence of proprietary roofing systems in localized markets.
- ❑ 16% of apprentices reported working in only one roofing system in the past year. This raises an important issue of skill breadth in the administration of apprenticeship.
- ❑ Interprovincial Mobility is significant in both the short-run and the long-run:
- ❑ 10% of industry members worked in more than one province in the past twelve months.
- ❑ 33% of industry members worked in more than one province in the past ten years.
- ❑ 12.5% of certified industry members are currently resident in a province other than the province in which they obtained their certification. This points to the importance of red seal certification and the maintenance of national standards.

Basic Skills (Reading, Writing, Trade Math)

- ❑ Reading and math skill requirements for non-supervisory jobs are moderate and compare approximately with grade 11.
- ❑ Basic computer literacy is not widely required at present.

The key recommendations resulting from the survey are presented by category as follows:

Trades Training and Certification

1. Increase resources committed to basic skills upgrading (reading, math, communications). This will be needed for both journeypersons and apprentices. In some provinces — especially in Ontario — English as a second language should be part of basic skills upgrading.
2. Designation of roofing as an apprenticable trade should be the norm in all provinces. In particular, this implies that steps should be taken to have roofing designated as a trade in Ontario.
3. In provinces in which certification is voluntary, introduce certification and training that reflects the tiering of the workforce among journeypersons, semi-skilled roofers and helpers/trainees. Journeypersons would continue to receive traditional apprenticeship training based on employment time and trades school instruction. Semi-skilled roofers would receive training in at least one type of roofing. Helpers/trainees would receive training in basic construction

procedures and safe working practices. The helper/trainee level would be the standard entry point into the industry for persons with no prior experience. Persons wishing to move from the helper/trainee level to semi-skilled roofers or to an apprenticeship should receive credit for their experience and prior training.

4. In provinces in which certification is mandatory and in which there is also a high rate of attrition from apprenticeships, greater use should be made of pre-apprentice training. If recommendation No. 3 is adopted, the training proposed for semi-skilled crew members would fulfill this role.
5. Establish a training council in which manufacturers of roofing systems are brought in as critical stakeholders in the industry. Introduce a system of tracking, certifying and recording training in proprietary roofing systems. Develop standards applicable to such training.
6. Expand upgrade training opportunities in: estimation, membrane welding and basic supervision skills.
7. Take steps to ensure the breadth of the trade by designing and administering apprenticeships that counter-balance specialization in only one type of roofing system. These steps might include increasing the trades school component. In light of the tendency of tradespersons and apprentices to work with one employer and the prevalence of employer specific training on proprietary roofing systems, rotation of apprentices across employers will not be practical in most cases.
8. Until approximately 2000/2001, new entrants should not exceed exits. A new entrant rate of approximately 6% in relation to an estimated exit rate of 7% would represent an appropriate re-balancing of supply of demand. After the balance between supply and demand is improved, average annual hours of employment will return to levels that prevailed in the 1980's. With lower turnover rates, the average level of proficiency in the industry will increase. This, in turn, will enable the industry to realize a greater return on its investments in training.
9. Make the red seal standard the operative standard in each province. Consideration should also be given to seeking mandatory status for the roofing trade in those provinces which currently make certification voluntary.

Basic Skills Training

1. Promote the adoption of a national occupational standard which specifies a reasonable degree of both skill breadth and skill depth.
2. Develop a system of recording, monitoring and certifying training in proprietary roofing systems and adopt standards applicable to this type of training.
3. Consider strategies for undertaking training in proprietary roofing systems on a multi-employer basis or using colleges to augment the generic and portable content of such training.

4. Make upgrade training available to supervisors in basic computer literacy with particular emphasis on retrieval and manipulation of computer-based drawings (i.e., CAD).
5. Ensure adequate math, reading and communications upgrading opportunities for apprentices entering the trade with less than grade 11.

6. Training Opportunities

The inventory of training opportunities was compiled by contacting the Canadian Labour Force Development Board, all the provincial roofing contractor associations and associate members of the Canadian Roofing Contractors Association by means of a simple questionnaire and telephone follow-up. A similar inquiry was sent to all SMWIA locals with training centers.

The inquiry identified six distinct training deliverers:

- Community Colleges and CEGEPS;
- Industry Associations;
- CCQ (Quebec);
- Union-Affiliated Training Centers;
- Non-Profit Non union Training Center; and
- Private (for profit) Training Centers.

Generally, apprenticeship programs are similar in structure but vary in distinct details across the provinces. Completing an apprenticeship and/or obtaining a Certificate of Qualification is only required to work in Quebec and British Columbia, in all other provinces the training and certification is voluntary. There are ongoing changes in some aspects of the system with Ontario now considering the regulation of roofing and Manitoba acquiring the training system now in place in Saskatchewan. Overall, the quality and quantity of roofing training programs is improving.

In provinces such as Alberta and Ontario, the industry wishes to create their own training school to meet its needs, as the industry finds that the programs currently available are not effective. In Quebec, there is a recently opened training facility which is well received by the industry. In Manitoba, a roofing apprenticeship program was recently put in place. While in Nova Scotia and New Brunswick there are no training facilities. In Nova Scotia workers are trained solely on the job, New Brunswick has no curriculum, and any training materials are out of date. Saskatchewan has a mobile training delivery system which goes to where the workers are; relying on employers to become involved in training. In British Columbia, an industry association operated school supplies workers to both the union and non-union sectors.

In addition to the formal in-class training for roofing apprentices, many of the roofing trade associations provide in-class instruction related to the application of various roofing materials. These are primarily focused on the health and safety related to the installation of products.

Due to the complexity and unique characteristics of various roofing materials, several product manufacturers offer worker training. Some manufacturers require training and certification of applicators as part of their licensed applicator agreements with roofing contractor firms. This is particularly prevalent with manufacturers of synthetic single ply, modified bitumen, elastomeric coatings and sprayed polyurethane foam. Training is conducted at the manufacturer's/supplier's facilities or at the roofing contractor's shops.

Some training is being provided by private (for profit) organizations. However, the primary focus of these providers is the managerial or maintenance personnel of public and private sector organizations. Courses on roofing are generally constructed in seminar and workshop settings.

7. Recommendations

The National Study Committee has prepared draft recommendations that are presented in this section. It is important to recognize that conditions vary across provinces and the need for change is not the same everywhere. Furthermore, the recommendations are intended to balance the needs of both the workers (union, non-union and future entrants) and contractors. In general, the workers are best served by fewer barriers to mobility and access to more work through enhanced personal skills. Contractors require access to skilled workers at competitive rates with the flexibility to manage their business to maximize growth and profit.

It is recommended that the "Sheet Metal and Roofing Trades National Sector Study Committee" work with industry leaders and structure activities that will:

- ❑ *A National Roofing Human Resources Committee* — structure a national roofing committee to implement the recommendations of this report;
- ❑ *National Standards* — encourage the further development of national occupational standards for roofing industry journeypersons and apprentices based on the established work in this area. Work with the provinces to gain their support for these standards;
- ❑ *Basic Skills Upgrading* — increase resources committed to basic skills upgrading (reading, math and communications) for journeymen and apprentices;
- ❑ *Certification and Training for a Tiered Workforce* — introduce trade certification and training for a tiered workforce structure that includes: journeyperson roofers (skilled); apprentices (journeypersons – skilled); material handlers (task-skilled) and roofer trainees (semi-skilled);
- ❑ *Tracking Certification of Proprietary Systems* — devise a system for certifying employer-based training in proprietary roofing systems. This system might include the adoption of a "training passport";
- ❑ *Specialized Upgrade Training* — expand upgrade training opportunities in estimation, computer operation, membrane welding and blueprint reading;
- ❑ *Broaden Apprentice Scope* — take steps to ensure the breadth of the trade by designing and administering apprenticeship so as to counter-balance the

specialization in only one type of roofing system. These steps might include increasing the trades school component;

- ❑ *Balance Entry and Exit to the Trade* — over the next five years the industry should be careful to limit the number of new entrants into the workforce to equal the number of exits. This should be accomplished by limiting new entry to roughly equal 6% of the workforce. Once a more satisfactory balance of supply and demand for labour is established the level of utilization will rise for workers;
- ❑ *Open Access for Equity Groups* — encourage an openness to proposals and requests from designated groups (women, aboriginal groups, handicapped people, visible minorities and others) that fit with the other recommendations noted here; and
- ❑ *Improved Human Resource Records* — develop a national, computerized standard system for keeping human resource records including hours of work, work experience, educational attainment, employment records (construction and non-construction), upgrade training, and certification and exit/retirement age. Records should track the certifications of workers on proprietary roofing systems.

These recommendations are based on the understanding that all roofing workers, regardless of their employment level, career aspirations, organizations of the crew, or the type of roofing (steep or low slope) require a basic and quantifiable set of skills in order to work efficiently and productively as members of a roofing crew.

The basis training will, therefore, be the minimum required by all individuals working in roofing, and should include instruction in such areas as safety, work organization, basic roofing technology and materials, equipment handling, math, communication, etc.

Upon completion of the basic roofer training, individuals who aspire to become journeyperson roofers may apply for apprenticeship training which would consist of the more structured and formal training currently in place.

This structure would most effectively meet the current and anticipated future demand for workers given a tiered workforce.