

CANADIANS BUILDING CANADA

Performance Through Partnership

NATIONAL MASONRY
HUMAN RESOURCES
ANALYSIS

2000

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Glossary of Terms and Definitions

Basic Math	Sometimes referred to as “trade math”, it covers math skills essential to the trades (e.g., measuring, converting from metric to imperial).
Basic Skills	Trade math and basic reading skills relevant to the trade, such as reading labels and manufacturers’ recommended installation procedures.
C of Q	Certificate of Qualification
CCDA	Canadian Council of Directors of Apprenticeship
CCQ	Commission de la construction du Québec
CMCA	Canadian Masonry Contractors’ Association
CMHRC	Canadian Masonry Human Resources Council, a proposed name for a new group of industry stakeholders that would be created to implement recommendations from this report.
CPR	Cardio-pulmonary Resuscitation
Demographic Cliff	An abrupt reduction in the supply of skilled labour as a result of a significant block of workers reaching the age at which exit from a trade increases sharply.
Dependent Contractors	A person whose engagement is styled as a contract-for-specified-service, but whose engagement does not meet the substantive “common law” tests for being an independent operator. Dependent contractors are legally employees. This implies obligations on the part of their employers for deducting income tax at source and making contributions to EI, CPP, WCB, etc. Employers also have obligations under Occupational Health and Safety legislation.
Engineering Sector	Includes construction and repair of infrastructure, such as roads, bridges, dams, ports and pipelines.
HRDC	Human Resources Development Canada
ICI	Institutional, commercial and industrial sector. Includes construction, repair and renovation of non-residential buildings.
Independent Operators	Persons who are self-employed within the meaning of the <i>Income Tax Act</i> and other employment related legislation, such as Workers Compensation. Independent operators are engaged the basis of a contract-for-specified-service. There are several “common law” tests that are applied to determine if a person is an independent operator. These tests address the substance of the relationship, as opposed to its appearance. The “common law” tests include: degree of supervision, provision of tools, number of unrelated contractors, degree of reliance on a single contract, risk of loss, opportunity for gain, etc.

IUBAC	International Union of Bricklayers and Allied Craftworkers
LFS	Statistics Canada's Labour Force Survey
Mason	Refers to bricklayer and stone mason trades that are defined in various ways in each province.
NSAS	National Sectoral Adjustment Service
OCS	Ontario Construction Secretariat
OMCA	Ontario Masonry Contractors' Association
PAC	Provincial Advisory Committee
Self-employed	A description of a working relationship where the worker operates independently from the employer. Employers do not withhold funds from compensation for income tax, fees and dues for industry activities and benefit plans. This employment status is often associated with (but is not identical to) independent operator status under Revenue Canada or Workers' Compensation Boards (WCB) regulations.
SIC	Standard Industrial Classification
Skill Breadth	The range of work areas in which a worker has skill and experience. Skill breadth increases employability.
Skill Depth	The number of specific tasks or skills relevant to a particular work area. Skill depth reduces the risk of installation error and also increases productivity.
TAC	Trade Advisory Committee
WCB	Workers' Compensation Board
WHMIS	Workplace Hazardous Materials Information System — a national system of symbols identifying hazardous substances and the procedures for their safe use. WHMIS also requires Material Safety Data Sheets to be available to workers using a hazardous substance. WHMIS training (approximately 5-8 hours) is mandatory and is an employer responsibility.
WITT	Women in Trades and Technology
Work Area	A classification of distinct operations usually allocated to bricklayers. These categories correspond to "blocks" of work in the National Occupational Analysis.
Work Task	A distinct activity that is combined with other tasks to complete areas of work. This concept corresponds to "tasks" defined in the National Occupational Analysis.

Executive Summary

This study was initiated by the National Sector Adjustment Service (NSAS) Committee for the Masonry Trade, a labour-management group, with the support of Human Resources Development Canada (HRDC). The committee's mandate is to create a human resource strategy for the masonry industry that will anticipate the impact of demographics, new materials and technologies, industrial change, the underground economy and other factors. These factors are combining to create rapid and disruptive change in the industry. In particular, the industry intends to regain market share and attract new masons and tilers who are confident in masonry work as a rewarding career.

These findings and the following recommendations have been validated by industry and provincial groups and will be the basis for national initiatives. A crucial component of the implementation plan will be to seek to gain further support from industry groups and each province for specific changes in labour market support systems. The Committee recognizes that the authority and jurisdiction to manage most of these systems rests with these other groups. To effect change in the current situation, the onus is on the national group to prove the merit of its recommendations and to convince the industry, province or training institutions to change the existing situation.

These circumstances pose a special challenge. Industry leaders must create labour market support systems that can renew the supply of skilled masons — even adding new skills to meet opportunities — while minimizing the costs of unemployment and empty training facilities during recessions and skill shortages during booms. All of this must be managed through dramatic cycles and with limited government support.

A strategic plan for these core workers and employers would be a difficult challenge by itself — but it would not be enough. The vision that is sought here must extend to the much larger workforce that includes the unemployed, underemployed and future entrants who look for a rewarding career in masonry. The plan must also set out priorities and needs in sufficient detail to assist training institutions and government agencies with their plans for the trade. Finally, the interests and the future of manufacturers, distributors and designers are naturally intertwined with those of the trades. Altogether there is a large group of workers and businesses with a stake in the future for masonry products and skills. Until now this group has been fragmented. A common vision and plan is needed.

The plan must anticipate market needs for workers and for special new skills. Industry support systems such as recruiting, training, certification, product standards and WCB must be improved. To be effective the vision must be shared and implemented by designers, suppliers, contractors, workers, unions and trainers.

Leadership of the Canadian Masonry Contractors' Association (CMCA) and the International Union of Bricklayers and Allied Craftworkers (IUBAC) — the original members of the NSAS Committee — is recognized and appreciated.

The Committee engaged ARA Consulting Group, a division of KPMG Consulting LP, in April 1998 to prepare research based on interviews with employers and suppliers, a survey of the employees, projections of the supply and demand for labour, a review of apprenticeship and training and demographic analysis of the workforce. This report contains the study findings and recommendations.

Industry Background and Labour Market Profile

Masonry work is defined here as the installation of brick, block, other concrete, stone, refractory, tile and terrazzo products in new buildings as well as the maintenance and restoration of these structures. Two distinct trades, mason and tilesetter, are traditionally assigned to this work and a third group, stone masons, are sometimes distinguished. There were approximately 17,500 masons and tilesetters working (or seeking work) in the masonry trades in Canada in 1998.¹ Most of these workers are employed in some 3,600 small contracting businesses across Canada. The average firm employs just four workers and one-quarter of the workforce describes itself as “self-employed”.

These employers and their workers are part of a complex system that includes suppliers, general contractors, designers, owners, regulators and supporting systems like health and safety and training. Most of the suppliers and related businesses are much larger than the contractors and this leaves most masonry businesses with reduced leverage.

Masonry contractors serve most construction markets including residential, industrial, commercial and institutional (ICI), as well as heavy engineering. Residential and ICI building are the largest markets. Restoration and renovation work is important and potentially represents a growing and less volatile market for masonry work.

Masonry is a risky business with employers facing low margins, high rates of bankruptcy and intense competition. Workers face frequent periods of unemployment, some risk of injury and high variability in the hours of work.

Conditions in the 1990s favoured the expansion of the underground economy in construction — work that is concealed from tax, regulation and other costs. Masonry is not among the most vulnerable trades, but most stakeholders contacted for this study mentioned the underground economy as a threat.

¹ Many of the statistics used in this report refer only to masons. Tilesetters are often excluded because this is a small trade where data is less reliable and complete. Sources like Statistics Canada often suppress data for smaller groups because of lower statistical reliability.

National employment patterns have been volatile during the 1990s with gains or losses of 5,000 jobs (one fifth of the workforce) over two years being common. Workers cope with this volatility by accepting periods of unemployment or leaving the industry for work elsewhere. This means that a large component of the workforce has a limited attachment to the trade and this would impact their commitment to training and other improvements.

Employment data for masons and tilesetters shows a declining trend with 20,000 reported working (or seeking work) in 1987 and just 14,500 in 1998. A recovery is reported in employment in many other trades, but recent gains in jobs for masons have not kept pace with the overall improvement in construction.

Labour Demand and Supply

Demand projections for the period 1999-2008 are developed as two scenarios. These cases were built from industry input in late 1998 and describe a higher “Base Case” situation with continuing growth in the economy and a weaker “Recession Case”. The former projection assumes a recovery in the Asian economy and continuing growth in the United States. The Recession Case is designed to capture the risk of a downturn in the economy that is almost as severe as the 1990-1992 episode. Recovery begins only in 2002 and is weak for the balance of the decade.

The upper and lower limits represented by the Base and Recession scenarios are intended to represent the boundaries within which the industry must plan workforce supply. Facilities must train workers to sustain work quality while avoiding heavy unemployment in the event of downturns. Promoting the mobility of the workforce and related training standards, such as Red Seal, will create a flexible supply.

Projections of demand for masons in these scenarios were adjusted downwards to correct for expected loss of market share to other systems and/or materials. After this correction, the employment projections show modest growth during a 1999-2000 recovery in the Base Case, with very limited growth in the 2002-2008 period. The Recession Case shows a drop in employment of masons from 2000 to 2002 and then a settling out at levels of employment that were reached in the early 1980s. Demand projections for tilesetters are generally stronger with the Base Case showing a steady expansion of jobs to 2008. The Recession Case for tilesetters falls to a trough in 2002 and then shows steady recovery to 2008.

Supply side projections of the workforce begin with the existing age profile and add assumptions about new entrants and exits. Given the high average age of masons and past rate of apprentice completions, it is likely that the overall workforce will decline by about 1.5% per year or by 1,500 workers between 1998 and 2008. By 2008 this decline would reduce the workforce to levels well within the middle range between the Base and Recession Cases. This situation anticipates a high likelihood of shortages. The short-term response of the labour market will be to fill the gap with hundreds of workers drawn from outside the industry — likely uncertified, young people who will create new risks of poor quality and injury. To avoid potential shortages (and to rebuild the population of certified masons), the past rate of admissions (and completions) of apprentices must be increased.

Profile of the Workforce

This section covers the results of the workers' survey completed by 770 masons for this study. Respondents had an average age of 44 among union members and 38 for non-union members. These values are higher than found in other construction trades and the spread between union and non-union is also higher — suggesting that the union labour force will contract more rapidly than other groups in the future. In particular, less than 4% of the sample was under the age of 25.

It is likely that the sample reported here is skewed towards older, unionized and certified workers given the method used to gather responses. Wherever possible the analysis takes account of the apparent bias and avoids drawing conclusions that are sensitive to this situation.

Immigration was a traditional source of new masons and tilesetters in Ontario, Alberta and British Columbia. The younger members of the workforce, however, are more likely to be Canadians who know someone in the trade. Government policy will further reduce immigration as an important source of masonry workers in the future.

Younger workers in the sample have achieved higher levels of formal education, but are less likely to have a Certificate of Qualification (C of Q) in the trade. This tendency to low levels of certification is also apparent in provinces where certification is voluntary. Masonry is a mandatory trade in New Brunswick, Québec and Nova Scotia.

Certification is expected to increase the employability of workers as employers recognize the skills and offer jobs to certified workers first. Survey data verifies that certified workers had moderately more hours of work in the year preceding the survey.

The workers' survey identified eight broad areas of work (e.g., “walls and foundations”) and up to 20 specific tasks within each area (e.g., “lay concrete blocks”). Workers are considered to have a strong *breadth of skills* if their experience spans three or more work areas. *Depth of skill* is identified among workers who specialize in one area and have extensive experience in several tasks within that area. Skill shortages would be threatened where the sample reported low levels of experience in areas or tasks.

The sample had only limited breadth of skills outside of the key “walls and foundations” area. Mobility among one or two areas outside of walls and foundations seemed to maximize earnings and offer sufficient breadth of skill. The implication, however, is that the overall workforce has limited capacity to move among alternative types of work like refractory, restoration and other specializations.

Mobility among employers is similar for masons and other trades, with half of the sample working for one company and half working for two or more over the past year. Interprovincial mobility for masons is slightly higher than other trades with 18% of the workforce working in more than one province during the year preceding the survey. Mobility is more common among older and certified workers, especially among workers with a Red Seal. Apprentices are the least mobile of all worker groups.

Two-thirds of the sample reported holding certification in their province — with predictably higher proportions in Québec, New Brunswick and Nova Scotia where certification is mandatory. Ontario reported the lowest incidence of certification.

Skills Profile

The workers' survey gathered information on a wide range of work experience and skills among masons. A survey of tilesetters was circulated but returns were insufficient to allow detailed analysis. This section reviews findings on the basic (verbal, math, health and safety) and occupational skills. Respondents were asked to identify the frequency of their work experience (e.g., “no experience”, “...do this work, but not often”, “...do this work daily”) and this frequency of their experience is assumed to represent their skill level. That is, if a worker does a task daily he/she is assumed to have the needed skills.

A series of questions about health and safety revealed that over 40% of the sample is concerned about respiratory illness, with lesser degrees of concern about back injuries, scaffolding and falls. Findings revealed that, in spite of their concerns, less than half of certified and only 31% of uncertified workers had taken basic health and safety training. In fact, 22% of certified and 38% of non-certified workers have not taken WHMIS training.

A review of basic math and literacy skills also revealed gaps. Only forepersons and supervisors in the sample reported frequent use of key skills. Gaps among others in the workforce — especially uncertified workers — may reveal a need for upgrade training. Certainly where job crews are small or where self-employed workers are left without supervision, there is a risk of inadequate basic skills.

Trade skills for masons were reviewed in eight work areas:

- ❑ build masonry walls and foundations;
- ❑ construct masonry arches;
- ❑ build masonry chimneys and fireplaces;
- ❑ build smokestacks, install refractory/acid resistant materials;
- ❑ build walks, patios, piers, garden walls, planters and other similar installations;
- ❑ restore masonry work;
- ❑ work with pre-fabricated masonry units or pre-cast concrete units; and
- ❑ install granite/marble slabs.²

² This work area is not part of the mason's trade in Québec.

Skill breadth is measured as the extent of work experience across the eight areas. Certified workers in the sample demonstrated greater breadth of work experience than non-certified workers. Skill depth is measured for each of the eight areas.

Foundations and walls are the core work area, representing 75% of work done in the trade. In general, skill depth and coverage is adequate with only isolated areas of new or unusual work where gaps may exist. Certified workers show marginally more depth than non-certified workers.

Work on masonry arches is an occasional specialty with only 17% of the sample reporting that they do this work regularly. Skill depth is adequate and there is evidence that workers can move into this area as demand warrants. There is no difference between skill depth for certified and non-certified workers.

A similar proportion of the sample work in chimneys and fireplaces. There is a high level of coverage and good skill depth. Non-certified workers report equivalent depth to certified workers.

Refractory work is reported to be the second most important source of employment with 20% of the sample involved. This workforce is more specialized with fewer masons having enough experience to fill in when demand surges. Skill depth is adequate among the specialized workforce and their contractors.

A smaller proportion of the sample reported working on walks, patios and exterior systems. In Québec this work is not done by masons. Skill depth is adequate and there is measurable gain in skill depth among certified workers.

Restoration work is estimated by the Committee to represent a large market but only 10% of the sample reported an active role in this area. The labour pool included here is thus small. Skill depth may be an issue, especially since restoration work requires a broad range of masonry skills. Work in this area can be physically demanding and technically challenging. Many workers do not like restoration work and other trades and younger non-union workers might be gaining a larger share. The sample was not really adequate to evaluate the situation.

Work with pre-fabricated materials was also reported only by 10% of the sample. Again work in this area may have been lost to other trades and younger, uncertified workers.

The installation of marble and granite was reported as regular work by only 5.5% of the sample. This proportion seems low and further research may be required to determine if this represents a skill shortage or loss of market to other employers and workers.

Overall then, the survey results find evidence of basic skills shortages in areas of health and safety and the potential for gaps in literacy and basic math. Across the eight work areas the findings show adequate skill depth and coverage. Refractory work appears as a distinct specialization with little backup support available from masons working elsewhere. The sample seemed to be under represented in key areas like restoration, marble and granite and pre-fabrication. Certification seems to be an advantage to workers and employers seeking to move among three or four of the work areas. However, there is only minimal evidence that certification provides more skill depth within each area.

Contractors' Perspective

Contractors were invited to contribute their views through a series of focus groups and a short questionnaire. Forty employers in British Columbia, Alberta, Ontario and Atlantic Canada were involved. Comments were gathered on current business conditions, trends in technology, market segmentation, the availability of skilled workers, certification, apprenticeship and journeyperson upgrading.

Contractors reported weak markets, intense competition and low margins, noting that these conditions have persisted since at least the early 1990s. There were only limited references to a recent recovery. Most observed that markets are being lost to new materials and systems and that these competing products are often brought to market by alliances of producers and installers. In contrast, the masonry industry was portrayed as fragmented and unable to provide a united, industry wide defence.

Groups commented that new technologies are available to speed up or lower the cost of masonry installation, but few presented these new innovations as solutions to the industry's problems.

Market fragmentation was reported as a concern as workers and employers might be able to earn more if they were not so specialized. Refractory work was identified as a specific case where workers' skills are not easily transferred to other masonry work. One implication cited here was that it is harder now for apprentices to get broadly-based exposure to the trade.

Shortages were identified for supervisory and foreperson skills. There was also concern about the availability of support for the trade from mason tenders. Contractors also identified gaps in basic math, literacy and health and safety skills. Employers were in agreement that attracting and maintaining new recruits was difficult and that the very high average age of the workforce made this a priority.

There was extensive discussion about creating national standards or making masonry a mandatory trade in all provinces. Most contractors spoke in favour of the principal but many were sceptical about implementation. Government support was thought unlikely by some and others questioned the cost and effectiveness of enforcing regulations. Participants agree that both workers and employers need to be convinced of the benefits of certification.

Commenting on the mobility of the workforce, many employers noted the importance of meeting temporary peaks in demand with workers from other provinces. There is a concern that older workers are less interested in moving and they are the ones with the certification and experience to do the work. Some employers also raised hiring hall practices among union locals as a barrier to mobility.

Employers in Atlantic Canada and the Prairies were critical of apprentice training while contractors in Ontario and British Columbia were more supportive. They were also critical of apprenticeship administration through PAC/TACs and they advocated a greater role for the industry. Specific criticisms were aimed at the limited coverage of refractory skills in most apprenticeship training. Journeyperson upgrade training was not identified as an issue.

Report on Technology

Technology is defined to include system design, new materials, methods in the application of materials, equipment, tools, and products that affect the quality of masonry work and/or the skill content and productivity of the workforce.

Information on technological innovations was gathered from employers through the focus groups and through interviews and research with manufacturers, suppliers and research groups, such as the Canadian Masonry Research Institute in Edmonton. In general, these sources emphasized two key points. First, the rate of adoption of new technologies in the trade itself is slow. Second, the introduction of competing products that displace traditional masonry products is a continuing trend.

Masons on construction sites have little exposure to computer related systems and no change is anticipated. However, computers are an important source of innovation in design and project management. These changes have important indirect impacts on the job site as workers are called on to build more complex and creative patterns. Also, project scheduling and logistics are improved.

The increasing use of pre-fabricated products and materials is seen as a critical change. Customized and low cost exterior cladding products are replacing traditional masonry in all markets. Evidence in the survey done for this study and in other sources shows that masons are not regularly involved in installing these products. Labour skills and costs are lower for this work.

Restoration work requires a unique combination of broadly-based traditional masonry skills, new skills and a tolerance for physically demanding work. Older workers in the sample are more likely to be involved with this work than younger. There is also evidence that much of this work is going to other trades, including plasterers and steeplejacks.

Research revealed a wide range of new materials that are available for the trade. These include new mortars, epoxies, latexes and thin-sets. Cellular blocks were also mentioned as an exciting new product that engages the skills of the masonry trade and has the potential for gaining a large share of the market for interior walls and partitions. If this product is successful, it could add significantly to work for masons.

One factor that is expected to accelerate the pace of adoption of new materials, systems and products is the switch from prescriptive to objective building codes. This change, expected in 2003, will allow new products to be used where they meet specific product standards. Current, prescriptive codes often specify masonry products in particular applications. Another well established challenge to masonry in buildings is the acceptance of sprinkler systems as a substitute for masonry fire walls.

The most important implication of these changes for employment in the trade is the substitution of new products and materials for brick and block structures. This substitution will displace masons from the construction labour force. A second challenge is from equipment that increases the productivity of workers and allows fewer workers for a given job.

An overall assessment of the impact of these factors is needed to adjust the forecast for masonry hours and employment. Discussion with the industry indicated that an appropriate adjustment would be 2% per year. This assumption means that the same overall volume of construction work ten years from now will require about 20% fewer hours of work by masons. This is a consequence of both the substitution of new materials for bricks and block as well as the adoption of new installation systems.

Training Opportunities, Apprenticeship and Access to the Trade

This section of the report evaluates access to the masonry trade and the state of apprenticeship and upgrade training. Results are based on research on training programs, work with women's and Aboriginal groups seeking improved access to construction trades, the workers' survey done for this study and interviews with employers, trainers and government officials.

Masonry is a recognized trade in all provinces and mandatory in Québec, Nova Scotia and New Brunswick. Tiling is a mandatory trade only in Québec. There are significant variations in entry qualifications, as well as the in-school and on-the-job components in each province. Apprentice courses are offered in at least one Community College or training centre in every province. Trainers and government officials reported, however, that course delays and cancellations were common due to inadequate registrations. During 1998 and early 1999 when the research was done, it appeared that there was only limited training ongoing in the trade across Canada.

During the 1990s apprenticeship enrolment declined steadily and total national completions were just marginally over 100 by 1996. New registrations, withdrawals and new certifications had also declined to minimal levels. Projections of the workforce, mentioned above, imply a net loss of 1,500 masons between 1999 and 2008. This calculation assumes that some 300 to 400 new entrants join the trade each year and this partially offsets losses to retirement. Given the importance of certification to the safety of the workforce and mobility of the workers, at least half of these new entrants (and ideally all of them) should enter through the apprenticeship systems. *This would require at least doubling the number of apprentices completing certifications from the number reported in the 1990s.*

Consultants reviewed and discussed several studies and initiatives that target access to the masonry trades by woman and Aboriginal people. This research revealed that little data is available on participation by these groups but evidence suggests very low levels. This situation may have been due to limited demand and inadequate access by traditional groups in the past. However, results presented here make it clear that, even in the face of modest demand, demographic changes will require more intensive and creative recruiting strategies to attract new entrants over the next ten years. Minority groups are a natural source to draw on.

Workforce Conclusions

Markets for masonry products face significant challenges from alternative materials and systems. The age structure of the trade indicates that a relatively large number of workers will leave the trade during the next ten to twenty years. To meet these shifting conditions, the industry will need to rebuild the apprenticeship system and improve the use of standards and certification. Attracting new entrants will be a challenge. The top priority will be improvements in flexibility and mobility of the workforce among provinces, employers, markets and areas of work.

These findings and the following recommendations have been validated by industry and provincial groups and will be the basis for national initiatives. A crucial component of the implementation plan will be to seek to gain further support from industry groups and each province for specific changes in labour market support systems. The Committee recognizes that the authority and jurisdiction to manage most of these systems rests with these other groups. To effect change in the current situation, the onus is on the national group to prove the merit of its recommendations and to convince the industry, province or training institutions to change the existing situation.

Recommendations

It is proposed that a new group, referred to as the “Canadian Masonry Human Resources Council” (CMHRC) for the purpose of this report, be created to facilitate the implementation of the findings and recommendations reported here. The CMHRC would likely include representatives from labour, contractors, manufacturers, distributors, designers and trainers, both organized and independent. The name, mandate, composition, governance, funding, priorities and other details for this group will be determined by the new members of the CMHRC in the first stages of its creation. Membership of the CMHRC will be determined in cooperation with industry, labour, Human Resources Development

Canada and the Canadian Council of Directors of Apprenticeship. It is incumbent on the CMHRC to find industry-based funding for its work. Based on the findings in this report, the CMHRC will set goals and establish activities in eight areas. These areas are set out in this section and are linked to the findings found in this report. Each recommendation is intended as the first step to solve industry problems. Industry stakeholders must take leadership roles in driving the implementation process.

Recommendation: Recapture Masonry Market Share

Evidence from several sources indicates that the share of brick, block, stone and other traditional masonry products is being lost to other products in new construction. This report cites the decline and weak recovery in employment by masons and the declining shipments of masonry products relative to overall construction. There is also evidence that restoration and renovation work is only a small component of work in the study sample, while market information suggests that this is a large, relatively stable and growing market for masonry. A general initiative targeting a gain in market share is recommended with particular emphasis on the repair, restoration and renovation segment.

For this initiative to succeed, it must include designers (architects, engineers, interior designers) who now receive too little training in masonry products. Evidence cited here shows that masonry products are under-represented in training programs and this must be improved.

See Sections 2.4, 2.5, 2.6, 3.1, 7.3 and 7.4 for more information on the loss of market share. Section 2.2 refers to a recent study of the extent of material-specific training in Canadian architecture and engineering schools.

Recommendation: Strengthen Management Skills (Business Acumen) of Contractors

Low margins, bankruptcy, the underground economy and new regulations and technology all challenge the capacity of masonry contractors. Suppliers do not offer adequate support and competitors with new products and systems are backed by strong industry promotion and guarantees.

Masonry contractors must find new skills and systems that will raise the quality and the image of their products. In particular, bidding, accounting, marketing and planning systems must improve and new standards are needed to prevent inexperienced entrants from undercutting realistic bids and weakening efforts by other to rebuild the industry's image.

Section 2 documents challenging market conditions and Section 7 records the loss of markets. Contractors comment in Section 6 on the impact of industry fragmentation.

Recommendation: Improve Health and Safety Practices within the Industry

Masonry workers and employers face special challenges in the area of health and safety. In most provinces WCB assessment rates are among the highest for masonry. The study survey showed that less than half of masons have necessary training in areas like first aid and working on scaffolding. Improving the extent of health and safety is a priority for the new CMHRC. Particular focus is needed on new entrants — especially those entering outside of apprenticeship — as well as independent operators or mason tenders.

See Section 5.1 for results on health and safety training in the study sample. Contractor's comments on health and safety are in Section 6.

Recommendation: Improve and Expand Apprenticeship Training

There are important benefits for workers, employers, owners and the public when certified workers install masonry products. For example, safety training and records are superior, a greater breadth of work experience offers certified workers higher income, and masons have more depth of skill in core areas like walls and foundations. Apprenticeship is the best system for certifying workers and the evidence shows that workers and employers are generally satisfied with this model. However, improvements are essential (such as a renewed focus on refractory work) and many new apprentices will need to be recruited in the next decade.

The Red Seal program is an essential part of the current system and it must be expanded as too few masonry workers are now qualified. Enhancing national training standards is needed because of the widely varying apprenticeship programs among provinces. One potential solution here is a core curriculum for the masonry trades. The CMHRC will be structured to be effective in the role of promoting national initiatives and working with government to improve training standards.

A general description of certification in the trades is found in Section 2.1 and results on the impact of certification are reported in Sections 4 and 5. Contractors comment on certification in Section 6.6. Data on the extent of certification is included in Section 8.

Recommendation: Maintain Size of Workforce by Balancing Entry and Exit to and from the Trade, to Meet Projected Market Demands

The age structure of the entire trade, but in particular of unionized and certified workers, shows that large numbers of skilled workers will exit through retirement during the next twenty years. Replacing this group will require special attention to attracting new entrants. However, this process is complicated by dramatic cycles that create massive unemployment, followed by surging demand and shortages. New and more intense efforts are required to monitor the trades and attract new entrants so that both long-term trends and short-term cycles are balanced in the plans for intakes. A target of increasing the number of certified masonry workers

must guide the planning. Immigration should be viewed as an important tool for managing the labour market and encouraged by the CMHRC when appropriate. Likewise, recruiting from non-traditional groups such as women and Aboriginal people should be included in supply management strategies.

Demographic projections are included in Section 3.2 and contractors' comments on labour demand are found in Section 6.5. Recent research on women and Aboriginal people in the trades is reported in Section 8.5. Data on apprentice entry, withdrawal and completion is included in Section 8.7

Recommendation: Improve Relations (Communication) with CCDA and PAC/TACs

Contractors report that the relations between the industry and governments — in particular training institutions — need improving. Strong communications will be essential to implement recommendations noted above in areas such as core curriculum. The CMHRC must improve the industry's relationship with the Canadian Council of Directors of Apprenticeship (CCDA) and provincial PAC/TACs. In particular, the CMHRC should accumulate and maintain a complete inventory of masonry training opportunities in Canada to provide an accurate and comprehensive reference source for improving training in the trade.

Contractor comments are in Section 6.7 and a general description of apprenticeship training is found in Section 8.

Recommendation: Improve Work and Career Opportunities Available to the Workforce

Workers and contractors in the masonry trades face significant financial and other work-related risks. Profit margins are low, unemployment is high and competition is intense. Even with the improving construction environment, opportunities are limited. However, better management of the workforce can improve the situation. Mobility among employers, among work areas and between provinces can allow both contractors and workers new opportunities. These broader horizons can smooth out risks during cycles and add needed jobs and incomes.

The key here is training. Upgrade training will add depth and breadth to a worker's career. In particular, masonry journeymen are traditional candidates for promotion to supervisor and management positions. Demographics and changing technology are threatening these opportunities. Also, the CMHRC recognizes that there are special needs to upgrade the workforce in refractory, renovation and restoration work.

Risks and challenges are documented in Section 2. Contractors regard the pending shortage of forepersons and supervisors as a priority issue (see Section 6.5.)

Recommendation: Improve Labour Market Planning

The need for trained masonry workers will likely fluctuate between dramatic peaks and troughs. Planning to sustain the quality and quantity of the workforce will be a major challenge. Continuous monitoring and regular projections are essential. But even the best planning will often fail to anticipate events. Flexibility in management plans and mobility among the workers are key features of an effective human resource planning strategy. It is further proposed that masonry contractors, working with general contractors, could derive means to extend seasonal working periods. This would increase the effective utilization of the workforce.

The starting point for labour market planning is included in Sections 3, 4 and 5 where new and detailed information describes the work in the trades. Results on apprentice registration and completions in Section 8 document how the current system will over react to cycles and leave the certified workforce dangerously short of talent.

Validation Process and Next Steps

The Steering Committee recognizes that the implementation of the recommendations will require the extensive participation of representatives from the industry in all provinces. The first step in securing this participation was to validate the findings and recommendations presented in this report with a wide group of industry stakeholders.

A series of workshops were organized across Canada and masonry industry representatives were invited, including management, labour, PAC/TAC representatives and suppliers. Forty-eight industry representatives participated in the validation process.

Each workshop participant was sent a draft copy of the National Masonry Human Resources Analysis along with a list of key findings, conclusions and recommendations. They were asked to rate their level of agreement with each point on a scale of 1-5, with 1 being 'Strongly Disagree' and 5 being 'Strongly Agree'. In addition, they were asked to rank the three most important recommendations.

Overall, the level of agreement with the findings of the study was high. The average rating across all of the items was 4.2 out of a possible 5. There was discussion around some of the findings where the degree of agreement was not unanimous, or where the findings did not fit with existing perceptions. For example: in the survey, older workers reported a higher proportion of mobility than did younger workers. Some workshop participants felt that finding was counter-intuitive, while others agreed with it. In other cases, the discussion re-

affirmed the findings, conclusions and recommendations, and made a stronger case to support them. Some of the perceptions and concerns from the workshops are captured in the following list:

- ❑ There was a degree of surprise in more than one group regarding the survey findings on health and safety statistics. Participants indicated that they would like to see some progress in that area.
- ❑ There are problems with certification. In some groups participants noted that the Red Seal exam is not reflective of the industry or of what is being taught in school.
- ❑ Testing is not satisfactory as different provinces apply different degree of rigor.
- ❑ Refractory workers are being certified without appropriate in-school training for refractory work. Refractory should have its own certification.
- ❑ There is not enough hands-on exposure for apprentices.
- ❑ Some contractors are not sending their apprentices to school until issues around testing are sorted out.
- ❑ In some areas, there were complaints about the quality of masonry products (block). The blocks were "out of square" and suppliers don't stand behind their products.
- ❑ Some of the newer types of construction (e.g. block warehouses) de-skills and/or under-utilizes the skills of a competent worker.
- ❑ Many new journeypersons do not have sufficient time on the tools before they get their certificate and are not worth journeyperson rates.
- ❑ Many of the industry-wide associations are disintegrating, contributing to further fragmentation.
- ❑ Immigration should not be ruled out as a future source of labour, particularly to meet short-term needs.
- ❑ There was discussion around labourers (mason tenders) and the awkwardness of accessing them from another union. This was seen as a barrier to entry to the trade.
- ❑ Some participants did not understand how there could be shortages in the trade while unemployment remains high. There was concern expressed by some labour representatives around the focus on apprenticeship and new intake, when most journeypersons were not getting sufficient hours in a year (some years it was less than 900 hours).
- ❑ Journeypersons are not retiring, they are being "burnt-out". There is no respect for the trade. Too much emphasis is put on speed and not enough on quality. Laying heavy blocks for extended time periods also could shorten a worker's career.
- ❑ The new Employment Insurance system penalizes seasonal workers.

The recommendations received a high level of approval, measuring from 4.3 to 4.8 on the scale of 1-5. The recommendation on “recapturing masonry market share” received the number one ranking in terms of importance. The second most important recommendation, as prioritized by the participants, was to “improve and expand apprenticeship training”. There was no clear third-place ranking in terms of priority.

The validation process described here was just one of several efforts to reach out to Canada’s masonry industry. This report represents the cumulative input of nearly one thousand workers, employers, suppliers and trainers in the masonry industry. Their views are the foundation of the findings, recommendations and next steps. The Steering Committee and the consultants wish to thank all those people for their contribution.

1. Introduction and Key Findings

Masonry is the oldest building trade. Not so long ago masonry was the most important material in buildings and masons were the leaders in the construction process. In the last 20 years the dominant position of masonry has eroded and workers are focused now on more specialized tasks. New materials and equipment offer the potential for expanded work opportunities and there is a steady demand for restoration and renovation work. Indeed, masonry products offer excellent long-term value in comparison to competing materials.

These opportunities can renew the promise of future work for those in the trade now and they can build a future market for the next generation of masons. In the near term, however, the evidence points to a gradual decline or perhaps a modest increase in employment. These trends will be hidden by continuing construction cycles that drive employment up and down, confounding the plans of employers, unions and trainers. Limited growth prospects, however, do not imply that the workforce can be allowed to erode in terms of quality of skills or age. Instead, the evidence suggests that builders will continue to need the full range of competencies that now characterize the trade.

These circumstances then pose a special challenge. Industry leaders must create labour market support systems that can renew the supply of skilled masons — even adding new skills to meet opportunities — while minimizing the costs of unemployment and empty training facilities during recessions and skill shortages during booms. All of this must be managed through dramatic cycles and with limited government support.

This report describes the current situation in the masonry trades and proposes a strategy for the future. The focus is naturally on the current workforce which has made large investments in training, certification and skills development. There is a similar priority attached to the employers who invest in apprentices, participate in planning for the whole industry and see the future of their businesses tied to a strong market for high quality masonry work.

A strategic plan for these core workers and employers would be a difficult challenge by itself — but it would not be enough. The vision that is sought here must extend to the much larger workforce that includes the unemployed, underemployed and future entrants who look for a rewarding career in masonry. The plan must also set out priorities and needs in sufficient detail to assist training institutions and government agencies with their plans for the trade. Finally, the interests and the future for manufacturers, distributors and designers are naturally intertwined with those of the trades. Altogether there is a large group of workers and businesses with a stake in the future for masonry products and skills. Until now this group has been fragmented. A common vision and plan is needed.

A human resource plan for masonry requires a vision that considers the future impact of demographic and technological change, new government regulations and codes, and economic conditions. The attractions and pressures of the growing underground economy are also an issue.

A vision is needed to focus on what is of lasting value to the masonry trade and the customers that they serve. Traditional values, priorities and skills are being challenged by new materials, tools, building systems, illegal and unsafe practices and restrictive government policies. It is necessary to create a strategy that builds the trade around work of lasting value and discards potentially damaging and inferior work.

1.1 Statement of Objectives and Mandate

Human Resources Development Canada (HRDC) has offered assistance to industry and workers through sector councils and National Sectoral Adjustment Services (NSAS) committees. These initiatives are joint efforts, by industry and HRDC, which target labour force adjustment. The construction industry was invited to take advantage of this system in the early 1990s. The result has been the creation of a series of construction NSAS committees.

The Canadian Masonry Contractors Association and the International Union of Bricklayers and Allied Craftworkers approached HRDC with a plan in 1998 and this report represents the results of this effort. The NSAS Committee for the Masonry Trade was created with representation from across Canada and from both union and non-union employers. Members of the NSAS Committee are listed in Appendix A. This initiative follows many years of joint industry efforts to build consensus on change and create new ways to promote and improve masonry products and systems. Indeed a major report in 1995 reviewed the strengths, weaknesses, opportunities and challenges facing the industry and concluded that a national review of human resources was a priority. These efforts have included the government agencies and training institutions that support the trade. In particular, these groups have been aware that training and occupational certification are provincial jurisdictions and that all provinces must be included in the implementation of change.

A Request for Proposals for a labour market analysis for the trade was circulated and a contract was awarded to ARA Consulting Group, a division of KPMG Consulting LP and its associates. The objective of the work is:

“ . . . to provide a guide for training and labour force development and adjustment over the next decade for the masonry trade. The trade is comprised of the following components — brick and block laying, refractory masonry, stone masonry, marble, tile and terrazzo setting, restoration and related activities. The study will determine the requirements for the trade to 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 trade workforce and its skills attributes to determine the training needs of masonry over the period.”³

³ See “Industrial Adjustment Committee request for Proposals for Labour Market Analysis for the Sheet Metal and Roofing Industry Trades and Occupations” Sheet Metal and Roofing National Sectoral Study, April 1995.

The following activities were proposed to achieve these objectives:

- interviews with the National Study Committee and regional/trade subcommittees;
- projections of hours worked by the trades for the period 1999-2008 and a discussion of factors driving this demand;
- projections of the workforce for the trade for the same period based on analysis of the age structure of the workforce, apprenticeship, exit rates and other factors;
- assessment of the skills attributes of the workforce based on a survey of union members and the non-union workers;
- a review of the pattern of technological change in the trades and an assessment of its impact on skills, training, hours worked and employment;
- a review of regional and equity issues related to entry into the trades by designated groups who are now under-represented in construction;
- an inventory of training resources available to the trades;
- analysis of the apprenticeship entry process; and
- a series of workshops to validate all of the above analysis.

Results of this research and analysis is described in this report and highlights of the key findings are summarized here:

- many masons are employed in very small businesses (see Section 2.2);
- contractors face a volatile and competitive market (see Section 2.4);
- margins are low, bankruptcies are high and opportunities to grow are limited (see Section 2.4);
- employment opportunities are both cyclical and seasonal (see Section 2.6);
- masons and tilers, like other trades, have shifted to self-employment and sometimes work in the underground economy (see Section 2.5);
- restoration and renovation work is important for masons and represents a growing and less cyclical market (see Section 2.3);
- a general recovery in construction has not yet raised employment past the 1990 peak and prospects for growth past 2000 are limited (see Section 3.1);
- employment of masons will move within a range of +/- 5,000 between 2000 and 2008 — the near term risks are of shortages in certain skills and areas (see Section 3.1);
- contractors are concerned about the fragmentation of the trade and loss of broadly skilled workers to retirement in the next ten years; there is a particular concern about the availability of forepersons and supervisory skills (see Section 6.5);
- consolidation of the industry's strength and focus is a key objective (see Section 6.5);
- current levels of apprenticeship registration will not meet the expected demand (see Section 8.7);
- there is evidence that certification is declining among young workers (see Sections 4.3 and 4.4);

- hours of work each year are higher for workers with a greater breadth of experience (see Section 4.4);
- mobility among provinces, employers and areas of work is greater among older and certified workers (see Section 4.4);
- in some areas of the trade (e.g., walls and foundations) certified workers report greater depth of skill, in other areas there is no difference (see Section 5.3);
- new materials and building systems are displacing traditional masonry cladding and interior systems (see Sections 7.3, 7.4, and 7.5);
- changes in building codes could facilitate the substitution of new materials and systems for traditional masonry products as well as encouraging the introduction of new materials to be installed by current masonry contractors and their employees (see Sections 7.3, 7.4, and 7.5);
- in general new materials and methods are reducing the number of hours and skills required from masons (see Section 7.8);
- contractors are concerned about the challenge of attracting young people to the trade (see Section 6.5);
- specialized products and pre-fabrication are encouraging subcontracting (see Section 6.2);
- demand for renovation workers will remain strong and this market requires workers who know most aspects of masonry work (see Section 5.3);
- demographic trends suggest a trend decline in the workforce of over 1.5% annually without renewed emphasis on apprenticeship and immigration (see Section 3.2);
- apprentices often need six or more years to complete — many drop out (see Section 8.7); and
- younger masons and tilers are less likely to be certified and more specialized in their work (see Section 4.3).

The report is organized into an executive summary and nine sections. This introduction is followed by an industry overview and labour market profile that sets the background. Section 3 presents projections of demand for masons and tilers and the availability of the workforce over the next eight years. Sections 4 and 5 present a detailed profile of the bricklayer workforce in Canada based on the results of a special workers' survey done for this report. Section 6 covers the viewpoint of contractors based on a series of focus groups held across the country. Section 7 reviews the impact of new materials and technology. Section 8 reviews entry to the trade and considers access by designated groups and the state of apprenticeship training. Section 9 contains draft recommendations and proposals for next steps.

2. Industry Overview and Labour Market Profile

Key Findings

- Approximately 14,000 masons and tilesetters were identified in Statistics Canada's Labour Force Survey in 1998, down from 20,000 in the early 1990s.
- The masonry industry is defined here to include contractors and workers installing refractory material, brick, block, stone, tile and terrazzo products.
- A broader industry can be identified that becomes a complex web that encloses contractors and their workers.
- Supplier businesses are many times larger than contractors and have considerable market power.
- Masonry contractors and workers serve all construction, repair and renovation markets with a focus on residential and industrial, commercial and institutional buildings.
- New construction markets are more volatile and repair/renovation activity promises less cyclical growth in the future.
- High and cyclical unemployment represents risks for workers.
- Low and cyclical profit margins and a high incidence of bankruptcy reflect risks for employers.
- The Underground Economy in construction is growing and masonry work has characteristics that encourage this type of work.
- The masonry workforce has less formal education and is older than other trades and has shifted towards self-employment since 1987.
- The downward trend in employment from 1987-1998 has been volatile with as many as half the workforce forced into unemployment or out of the industry at different times during the decade.

This section provides background on the masonry contracting industry and its workforce. The material orients the reader; providing basic information on the scope of the industry, key issues and risks, labour market conditions and the industry's capacity to plan and adapt to new conditions.

2.1 Industry Structure and Definition

There are several ways to describe the “masonry industry”. The focus of the study is on a narrow, trade-oriented perspective, but a wider context is also frequently used and it offers a broader and more complete view of issues and prospects.

Current statistics indicate that, during 1998, there were 14,500 workers seeking employment or working as masons and another 3,000 tilesetters in Canada. Of these, some 12,900 masons and 2,500 tilesetters were in the construction industry.⁴

This report is focused on these workers and their employers. These trades and their work are commonly called the “masonry industry” and their primary business is installing and repairing masonry products in structures across Canada. Within this overall class of activity, two groups are commonly separated: masonry and tilesetting. The skills and requirements of these activities are distinct and they are regarded as separate trades in most jurisdictions. It is, however, sometimes difficult to separate measures in statistical sources. Where it is possible to make the distinction between masons and tilesetters it is done.

A useful point of departure for this work comes from the National Occupational Analysis for masons, which includes the following areas of work in the description of the trade:

- participating in workplace health and safety;
- performing related tasks and planning work activities;
- building masonry foundations and walls;
- working with pre-fabricated masonry units;
- building masonry, chimneys, smokestacks and fireplaces;
- constructing masonry arches;
- building walks, patios, piers, garden walls, planters and other similar installations;
- installing refractory materials;
- restoring masonry work; and
- performing miscellaneous masonry work.

There is no comparable analysis for tilesetters.

⁴ Source: Statistics Canada, Labour Force Survey, a monthly survey of Canadian households that identifies people working, seeking work and unemployed.

A second source for workforce statistics is the 1996 Census and this shows 14,000 masons and 4,800 tilers. This relatively close correspondence of the Labour Force Survey is likely due to the distinct nature of these trades — people are not likely to identify themselves as masons without some specific training or work experience in the activities that we are studying here. Other construction trades are not so clearly identified.

To understand the broader context for the trades and their employers, it is useful to step back to a broader perspective that includes other related businesses. This would take in brick, block and stone manufacturers, designers (engineers, architects and interior decorators) and distributors. This broader coalition of businesses share concerns about the role of masonry materials in structures, building codes, design practices and market conditions.

Figure 2-1: The Broader Industry (Building)

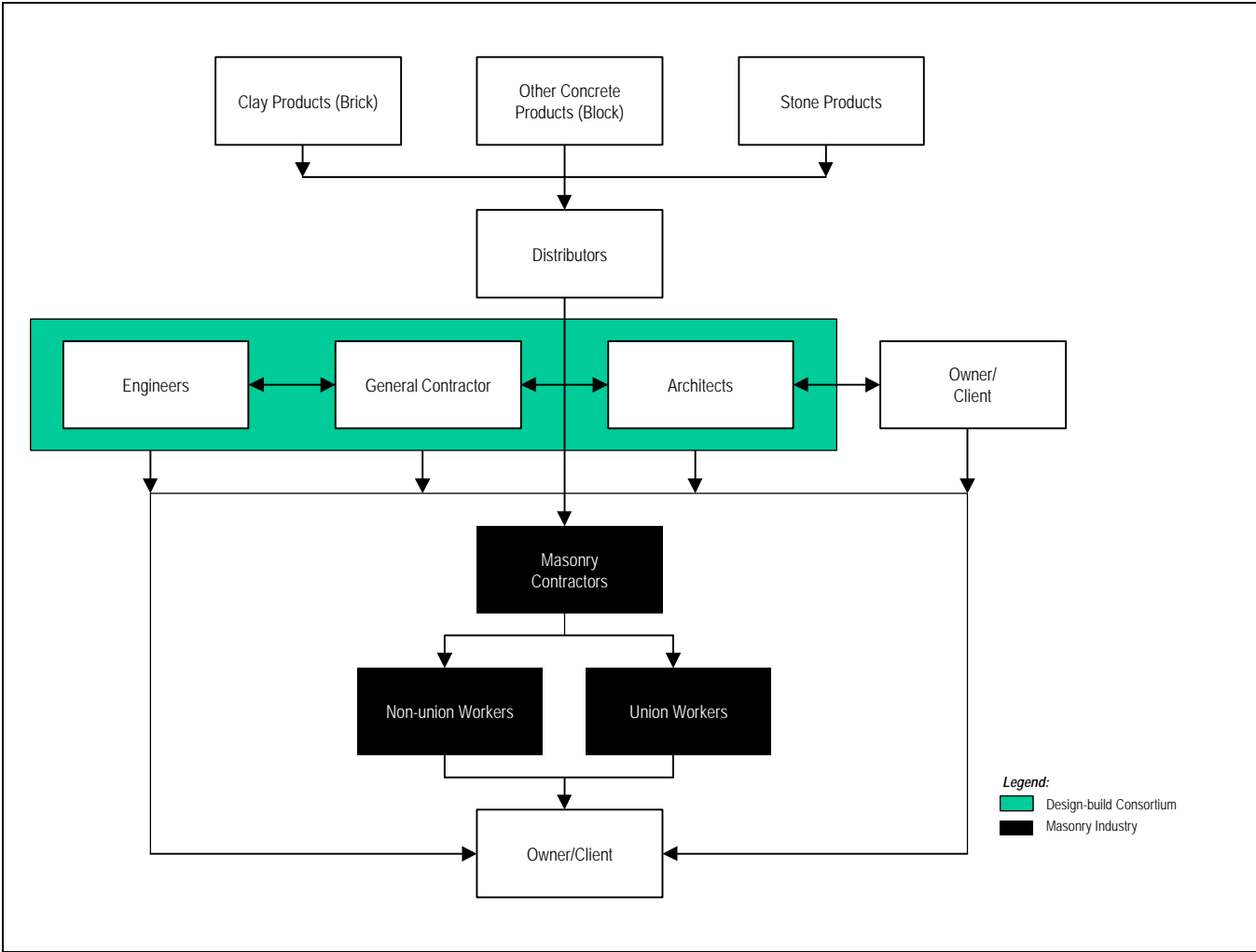


Figure 2-2: The Broader Industry (Building and Regulation)

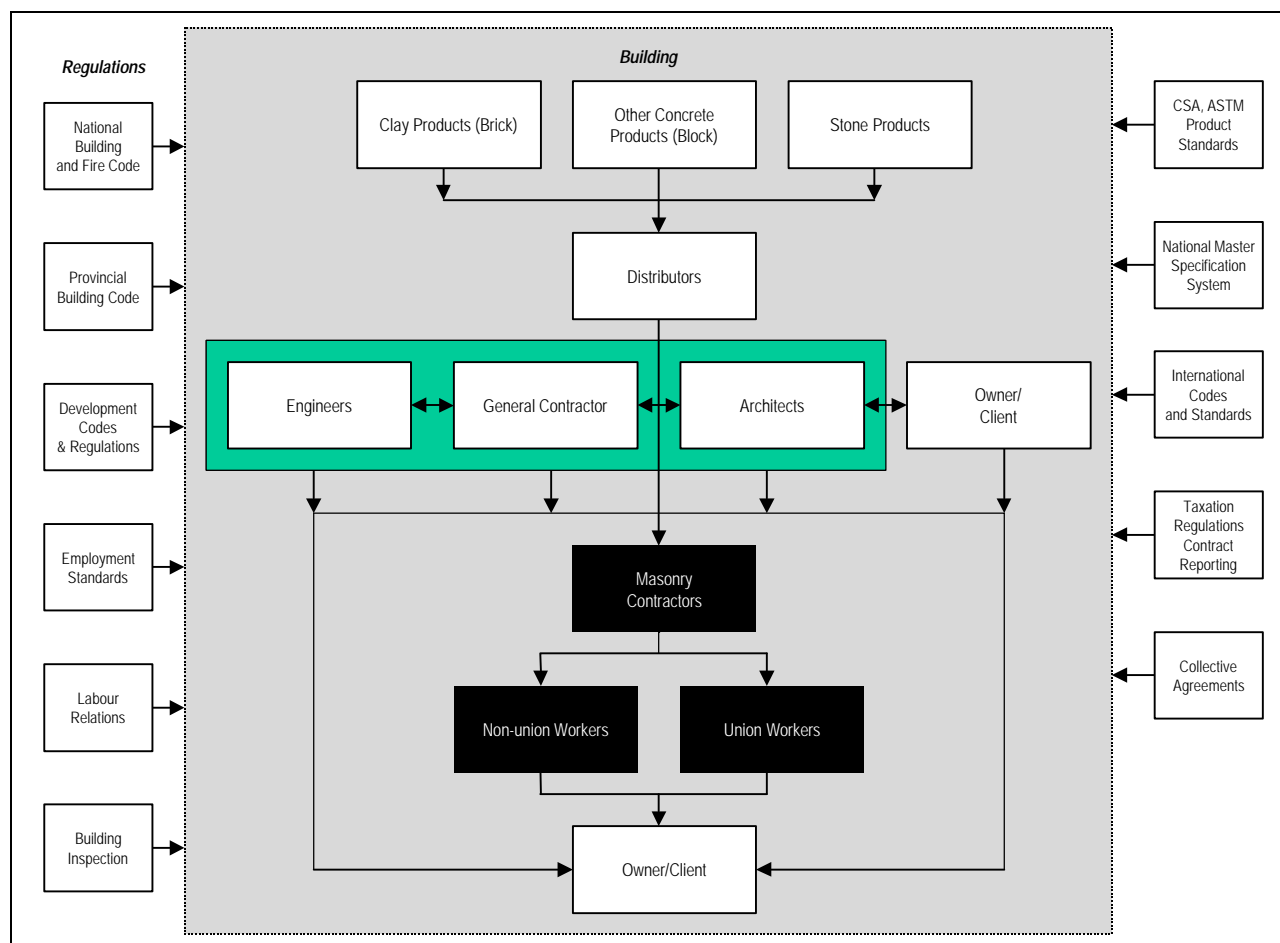
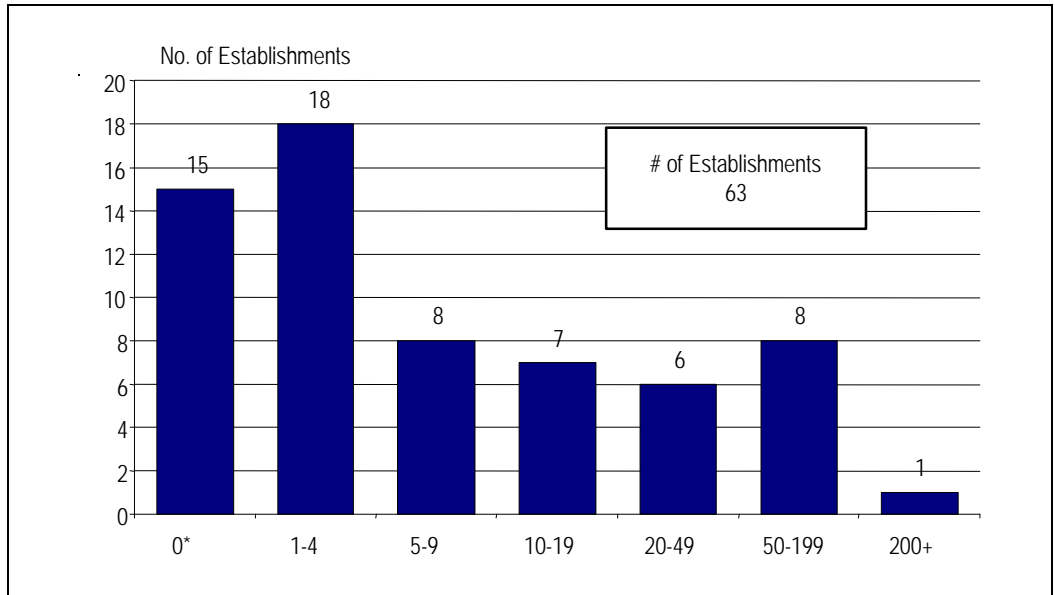


Figure 2-1 shows the various businesses involved in the actual building of masonry structures. All of these groups are joined together in complex, commercial relationships and share the goal of delivering quality structures to the owner/clients. These relationships are further complicated by the roles of codes, laws and regulations that restrict almost every aspect of building. These are illustrated in Figure 2-2. The final image is one of contractors and workers caught in the centre of a complex web of commercial and regulatory relationships.

2.2 Industry Size and Distribution (1998)

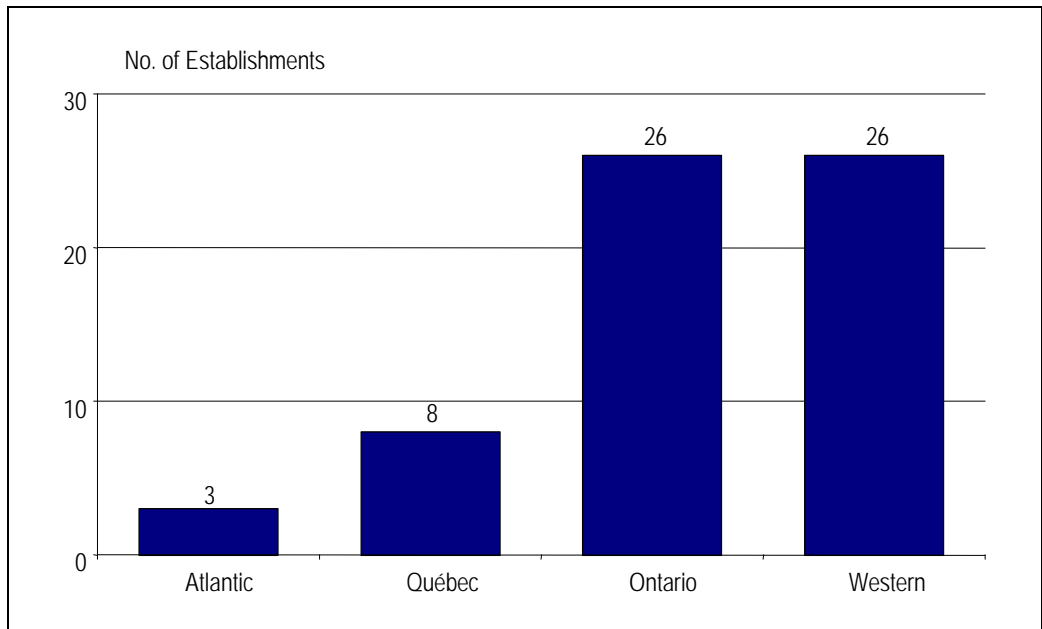
There is a very large discrepancy among the size and market conditions of businesses in the more broadly defined masonry industry. The suppliers are large manufacturing concerns, where economies of scale promote growth and consolidation. Figure 2-3 shows the distribution of clay products (largely brick) manufacturers by employment and Figure 2-4 shows their location across Canada. There are only 63 such manufacturers in all of Canada and they are heavily concentrated in Ontario. Indeed, even this small number is misleading as Statistics Canada includes many non-construction businesses in this total. The very largest firms produce that vast majority of bricks and have considerable market power. For example, one concrete block plant in Ontario has the capacity to supply the entire province. Contractors in some regions are obliged to purchase materials, likely through local distributors, from manufacturers in distant locations. This separation often weakens access to the latest information on products and processes.

Figure 2-3: Clay Products (from Domestic Clay) Manufacturing
1997 Size Distribution of Establishments (Canada)*



Note: '0' refers to establishments with no paid employees (i.e., self-employed)
Source: Statistics Canada; Canadian Business Patterns, Business Register Division

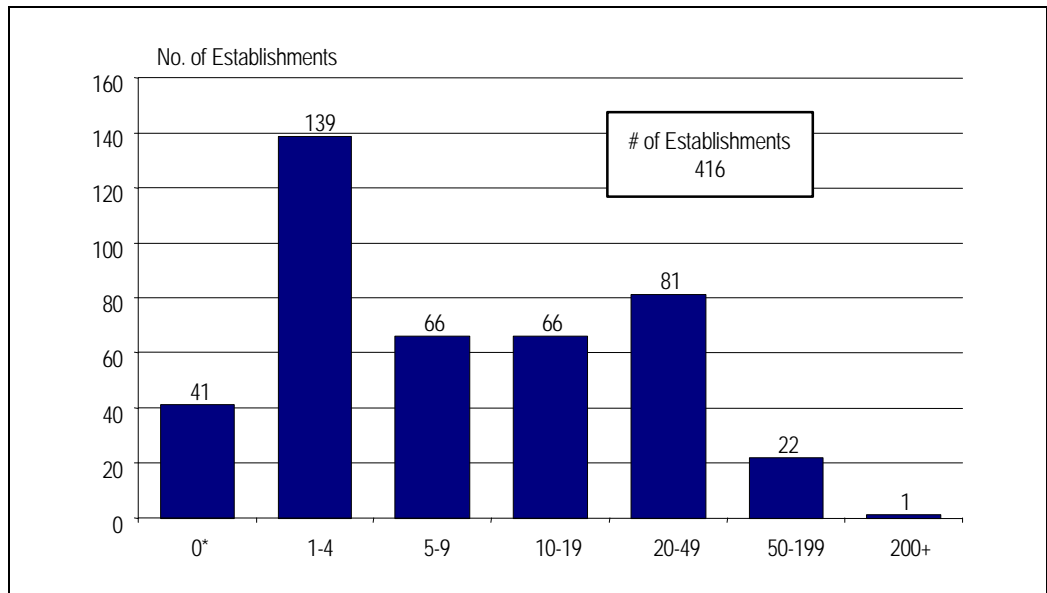
Figure 2-4: Clay Products (from Domestic Clay) Manufacturing
1997 Geographic Distribution of Establishments (Canada)*



* Including Concrete Brick and Building Blocks
Source: Statistics Canada; Canadian Business Patterns, Business Register Division

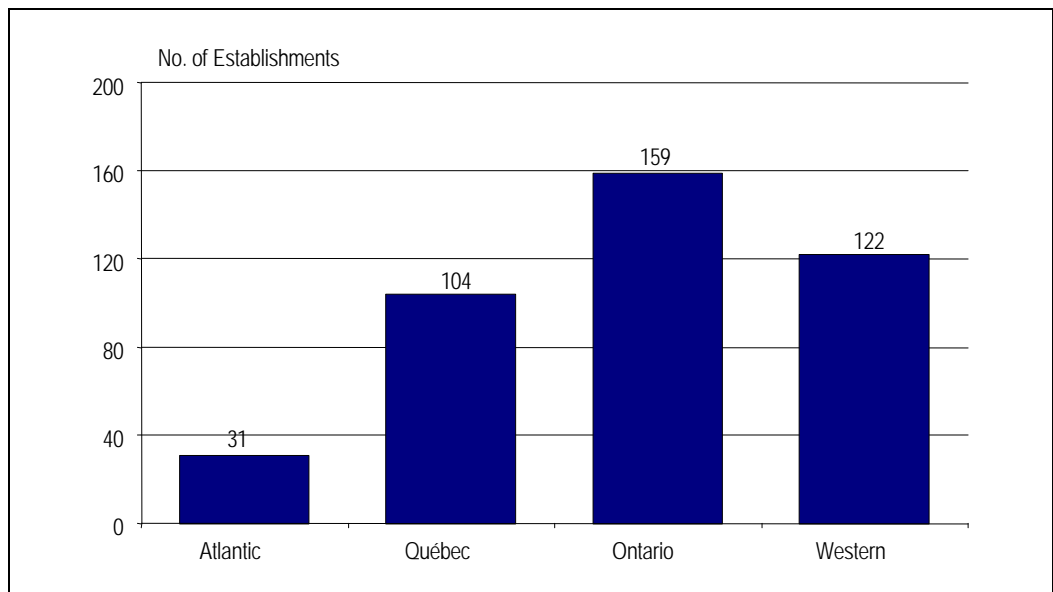
Figures 2-5 and 2-6 show the same data for other concrete product manufacturers. This category excludes ready-mix concrete suppliers and includes various pre-fabricated products, as well as traditional masonry blocks. There are only 416 such businesses in Canada. These businesses are quite large and are focused on markets that span several provinces. Indeed, trade in brick, block, concrete forms and other related building materials is expanding and this suggests that the natural scope for these businesses is growing larger.

Figure 2-5: Other Concrete Products Manufacturing
1997 Size Distribution of Establishments (Canada)*



Note: '0' refers to establishments with no paid employees (i.e., self-employed)
Source: Statistics Canada; Canadian Business Patterns, Business Register Division

Figure 2-6: Other Concrete Products Manufacturing
1997 Geographic Distribution of Establishments (1997)*



* Including concrete brick and building blocks
Source: Statistics Canada; Canadian Business Patterns, Business Register Division

Scale economies in production are just part of the reason for this wider scope. Larger firms can support more research and development, and sales and marketing expense. As this consolidation continues, it builds market power in the suppliers and alters the balance with contractors. A similar shift is apparent as specialty suppliers introduce new products to the market and seek special relationships with contractors. These arrangements tend to fragment markets and create distinct conditions in market segments. One variation on this would be a regional focus where a supplier uses market strength to increase share and lock up special relationships with contractors.

The industry has signalled its commitment to research and development of masonry products through the endowment of the “Martini, Mascarin and George Chair for Masonry Design” at the Engineering Department at McMaster University in Hamilton. This initiative is funded by the Ontario Masonry Contractors’ Association. Designers (architects, engineers, interior decorators) are key players as they often make the crucial decision regarding materials to be used, suppliers and warranty conditions. Industry observers during an industry study in 1995, often commented that strengthening the masonry industry required building new connections with designers and owner/clients. These connections would be based on engineering research and industry promotion that highlight the advantages of masonry products over substitutes like metal and plastics-based claddings, or poured and pre-fabricated concrete in foundations and the building structures. The quality and cost of installation are clearly issues here and this raises the importance of contractors and the workforce in the long-term success of masonry products.

Efforts continue to build stronger relationships with engineers and architects. The Canadian Masonry Research Institute in Edmonton continues strong technical work that documents the advantages of masonry in general and new products in particular, and supports the industry on issues related to changes to building and fire codes. Provincial associations are focused on important changes in building and fire codes. These issues are covered in more detail in Section 7 on technology.

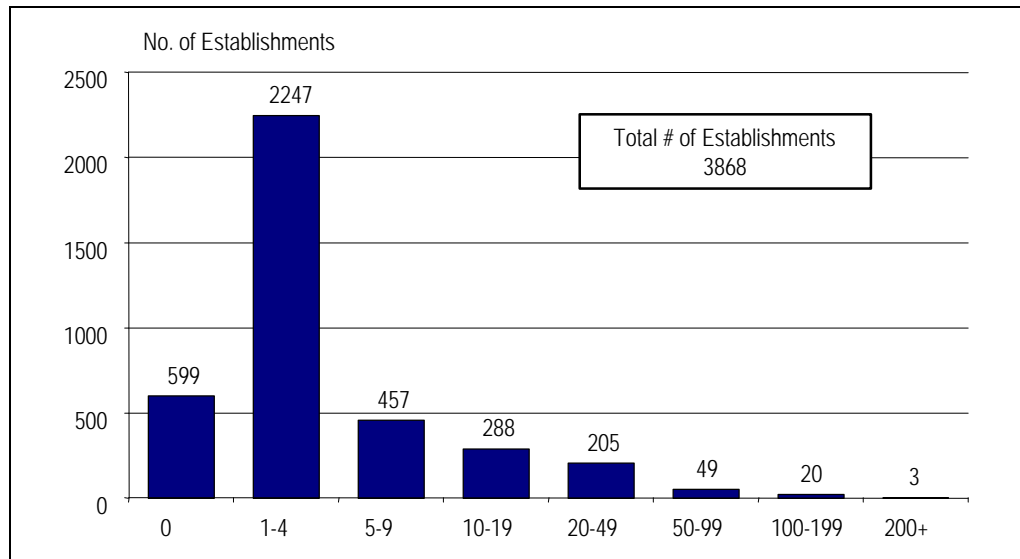
There is recent evidence, however, that current efforts to promote masonry products in architecture schools, engineering departments and community colleges are not adequate. Masonry Canada surveyed training institutions to measure the relative time devoted to teaching concrete, steel, timber, asphalt and masonry. Results showed that masonry ranked last among these materials, as it was only featured in 3% of lecture time. The low priority offered to masonry was repeated in all programs, with the modest exception of architecture where it received slightly more attention as an exterior cladding material.⁵

Much of the work that would build cooperation among the wider masonry industry and focus on issues of concern is beyond the scope of this report. However, the core messages reported here might draw the wider interests together. These messages include: weak sales of brick, block and stone, declining employment, fragmented working conditions and concern about improving the quality of installation.

⁵ See “Masonry Canada/CPCA Professional Education Survey, September 1999.

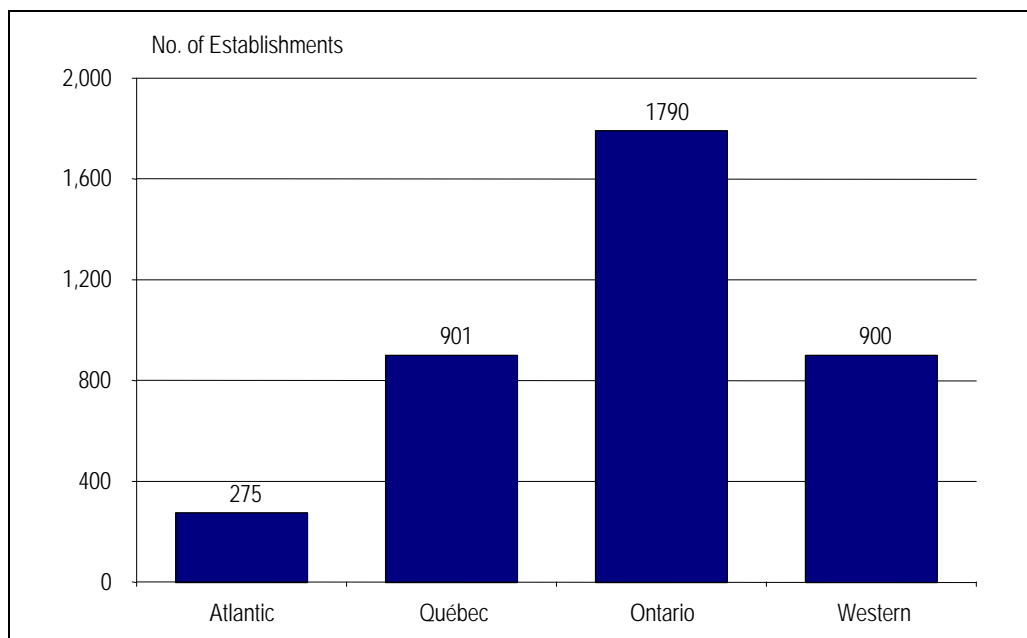
Commercial relationships among suppliers, designers and contractors could be the basis for a powerful coalition that could target improved market share. There is evidence that such an approach is starting. However, conflicting interests are a challenge to the broadly-based industry initiative. For example, provincial groups choose alternative strategies and fracture any national cohesiveness. Suppliers can diversify into competing product lines (e.g., pre-fabricated materials) and appear as competitors rather than allies. Rivalries among unions and industry associations focus on narrower issues and obscure serious challenges. Union and non-union contractors remain caught in a destructive competition that drives prices down and threatens the capacity of the industry to supply experienced and skilled workers.

Figure 2-7: 1997 Distribution of Masonry Contractors by Employment



Note: '0' refers to establishments with no paid employees (i.e., self-employed)
 Source: Statistics Canada; Canadian Business Patterns, Business Register Division

Figure 2-8: Distribution of Masonry Contractors by Region



Source: Statistics Canada; Canadian Business Patterns, Business Register

Figure 2-7 and Figure 2-8 set out the size and regional distribution of masonry contractors. These firms are tiny in comparison to the major suppliers. There are over 3600 contractors in Canada and three-quarters of these firms employ four or fewer workers. Even the larger firms are much smaller than the mid-sized suppliers. These firms are vulnerable to the volatility of construction markets and to the bargaining clout of suppliers.

2.3 Markets by Segment

There are several dimensions to construction markets served by masonry contractors. Figure 2-9 divides construction spending into new construction and repair/renovation and into segments — residential, industrial, commercial, institutional and engineering. Masonry serves each of these.

Figure 2-9: Distribution of Construction and Renovation Expenditures in Canada (1997)

	New Construction		Renovations		Total Expenditures	
	\$ Millions	%	\$ Millions	%	\$ Millions	%
Residential Building Construction	\$21,890.5	58.5	\$15,516.0	41.5	\$37,406.5	100
Industrial Building Construction	3,656.2	90.1	401.1	9.9	4,057.3	100
Commercial Building Construction	5,631.7	78.1	1,578.1	21.9	7,209.8	100
Institutional Building Construction	3,307.3	69.0	1,484.7	31.0	4,792.0	100
Other Non-residential Building Construction	2,053.2	87.4	295.4	12.6	2,348.6	100
Total Non-residential Construction	14,648.4	79.6	3,759.3	20.4	18,407.7	100
Total Engineering Construction	32,186.7	95.0	1,678.2	5.0	33,864.9	100
Total Spending	\$68,725.6	76.6	\$20,953.5	23.4	\$89,679.1	100

Source: Statistics Canada, Capital Expenditures by Type of Asset 1999

Three-quarters of spending is for new construction and one-quarter for repair and renovation, but these proportions shift in the residential sector where repair and renovation represents almost half of activity. Across all spending, residential construction represents almost half of the activity. While masonry is included in all these construction segments, it is assumed to be more intensive in the residential, industrial, commercial and institutional sectors with less focus on engineering projects.

The non-residential markets present a challenge as new materials are becoming common substitutes for masonry. This shift is driven by both building costs and designer/owner preferences. Institutional buildings such as schools and hospitals are a key segment where new building is starting now and substitute materials pose a treat. Work in these segments is often lucrative as jobs are large, but markets are volatile.

Residential markets are important for masonry with strong regional preferences apparent. Masonry continues to hold a large share of new residential construction in Ontario, Québec and the east, but is losing share in the west. Across all residential markets, the relative importance of repair and renovation work is growing. In fact, almost half of the residential market is focused on repair and renovation and this work is related more to the installed base than to new competition or style.

Figure 2-10 is taken from a separate Statistics Canada source and it details repair and renovation activity in the residential market. Categories of spending in italics in the table are potential markets for masonry work and these total about 24% of the estimated market in 1997. This is an important market, based on the existing inventory of structures and thus somewhat less cyclical than new construction. Regular maintenance and repair work in this market will be more evenly distributed across time and regions. Figure 2-11 provides the regional distribution of spending on household repair and renovation. Not surprisingly, the distribution follows that usual pattern of general population, with a slight bias to the east where the stock of housing is older.

Figure 2-10: Household Repair and Renovation Expenditure Estimates — Aggregate (1997)

Type of Work	\$	%
All Repairs and Renovation	12,801	100
Repairs, Maintenance and Replacements	4,550	35
<i>Brick, Block and Stone Markets:</i>		
Outdoor patios, fences and driveways	249	2
Exterior walls	167	1
<i>Tile Markets:</i>		
Other Interior Walls and Ceilings	155	1
Additions, Renovations and New Installations	8,252	65
<i>Brick, Block and Stone Markets:</i>		
Structural extensions	1271	10
Garages and carports	372	3
Fences, patios, driveways	369	3
<i>Tile Markets:</i>		
Interior and Exterior	514	4
Total Masonry Markets	3097	24

Source: *Household Repair and Expenditure, 1997 Statistics Canada, Catalogue # 62-201*

*Figure 2-11: Household Repair and Renovation in Canada
Expenditure Estimates by Province*

Province	Millions of \$	%
Newfoundland	224	1.7
Prince Edward Island	59	0
Nova Scotia	394	3.1
New Brunswick	276	2.2
Québec	2,806	21.9
Ontario	5,073	39.6
Manitoba	406	3.2
Saskatchewan	437	3.4
Alberta	1,288	10.0
British Columbia	1,838	14.6
Canada	12,801	100.0

Source: Household Repair and Expenditure, 1997 Statistics Canada, Catalogue # 62-201

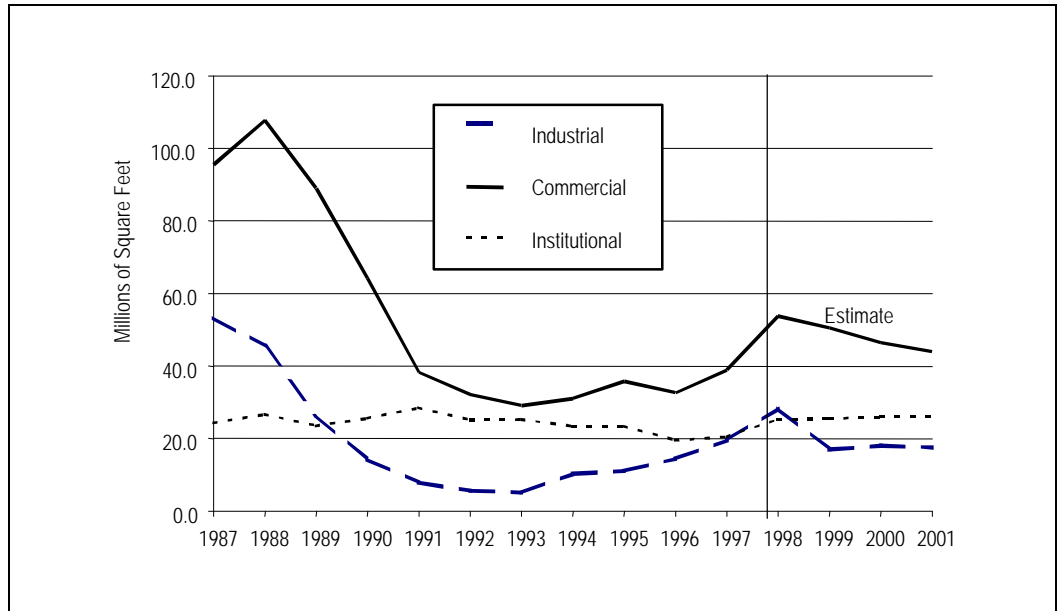
2.4 Performance and Trends

This section reviews the dynamics of masonry markets from 1987-1999. Various measures of activity are available for these 12 years of history and they span the dramatic cyclical boom and bust of the 1990s. Scenarios for the future, presented in the next section, are designed to capture the risks and volatility that characterized this period.

Volatility in New Construction and Renovations

The most cyclical volatility was focused in new construction spending. Figure 2-12 reports annual starts of Industrial, Commercial and Institutional construction. This is perhaps the most dramatic evidence — showing the peak in 1988 and then the 50% decline to the 1993 low point. The 70% drop in national commercial building was the largest and this slump was more severe in some provinces. Recovery in 1997-1998 reported here is well underway, but there is evidence of a moderate drop in 1999 and improvements have not yet restored the 1989 levels of activity.

Figure 2-12: Construction Building Starts (Canada)

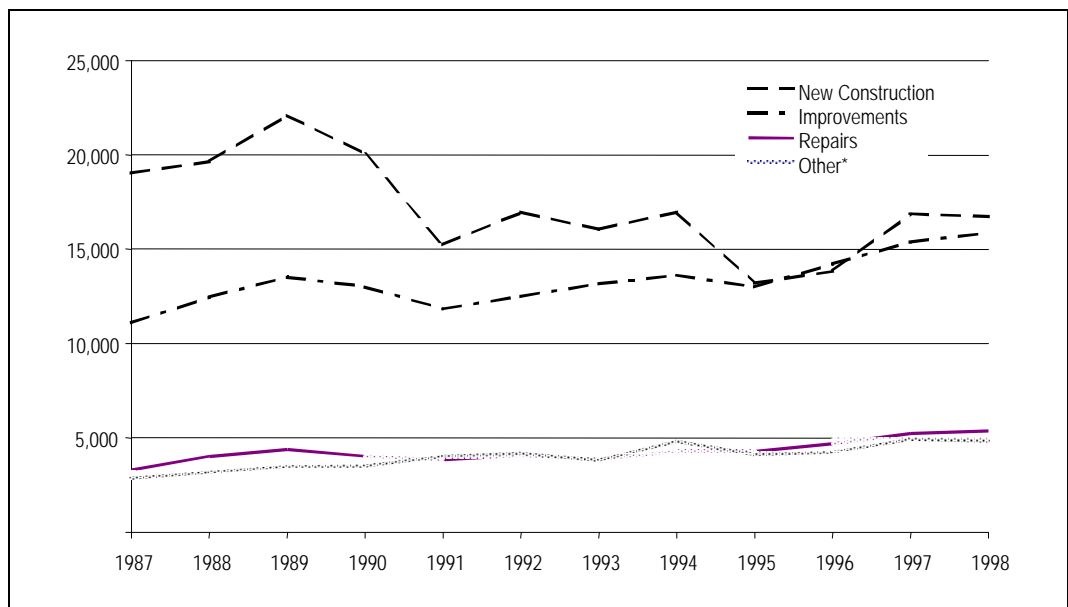


Source: CanaData

Housing activity has been just slightly less volatile with starts peaking at 250,000 in 1987 and bottoming out at 120,000 in 1996. Activity in 1999 has recovered but is well below the 1989 peak.

Spending in repair and renovation is less volatile than new construction as owners are obliged to keep up repair and renovation activity. Certainly this work can be delayed, but evidence suggests that there is a steady, trend increase in this market. Figure 2-13 shows this pattern; reporting on the value of both new residential construction spending and repair and renovation.

Figure 2-13: Residential Construction Spending (\$ Current 1987-1998 Canada)



Source: Statistics Canada

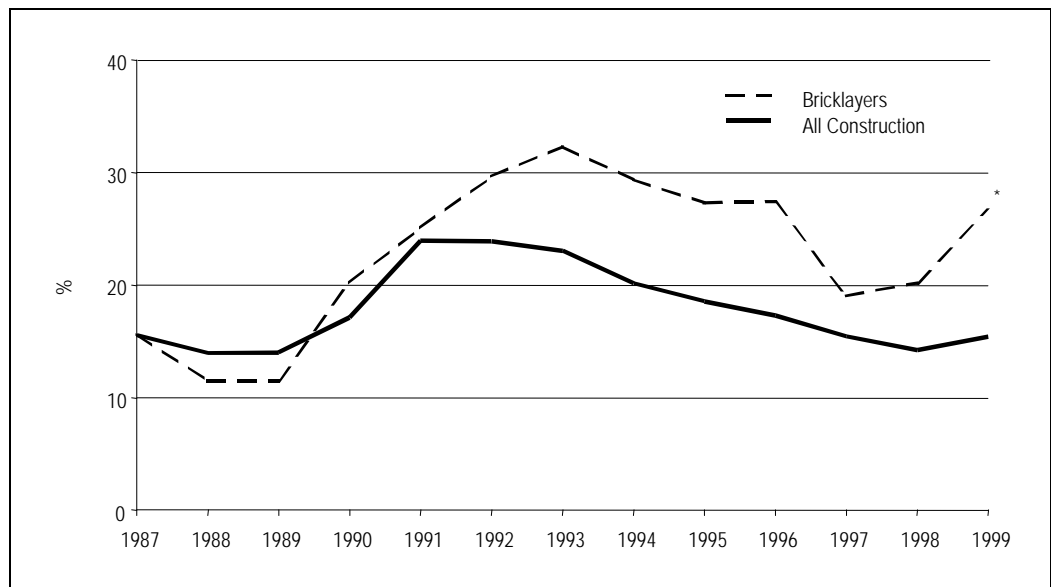
Certainly repair and renovation work declined during the worst of the recession period in the early 1990s. But the trend of rising spending prevailed over the longer period between 1987 and 1998, with average annual increases of 4.6% in value and about 3.5% in volume. Similar trends are apparent in the smaller market for repair and renovation in ICI. Repair and renovation work is thus a growth market with less cyclical risk than other markets. This is a natural focus for the industry. Skills required of the workforce here are somewhat distinct and this matter is revisited in Sections 6 and 7.

Risks for
Employers and
Workers

Construction is a risky industry and the past decade has been particularly difficult. All of the industry stakeholders noted in Figures 2-1 and 2-2 are impacted, but workers and contractors are likely more vulnerable as they are small and often isolated.

For workers the most obvious risk is unemployment. Figure 2-14 highlights the pattern of rising and declining unemployment for construction and masons from 1987-1998. Volatility increases at each level with masons confronting a massive increase in unemployment from 11% of the workforce in 1987, to over 30% in 1993. Market improvements by late 1998 had brought the rate back down to just under 20% again. These swings in unemployment are just one aspect of cyclical risk for masons. In the next part of this section and again in Section 5, the report documents other cyclical responses (e.g., workers leaving the industry altogether, reduced work hours) to changing working conditions.

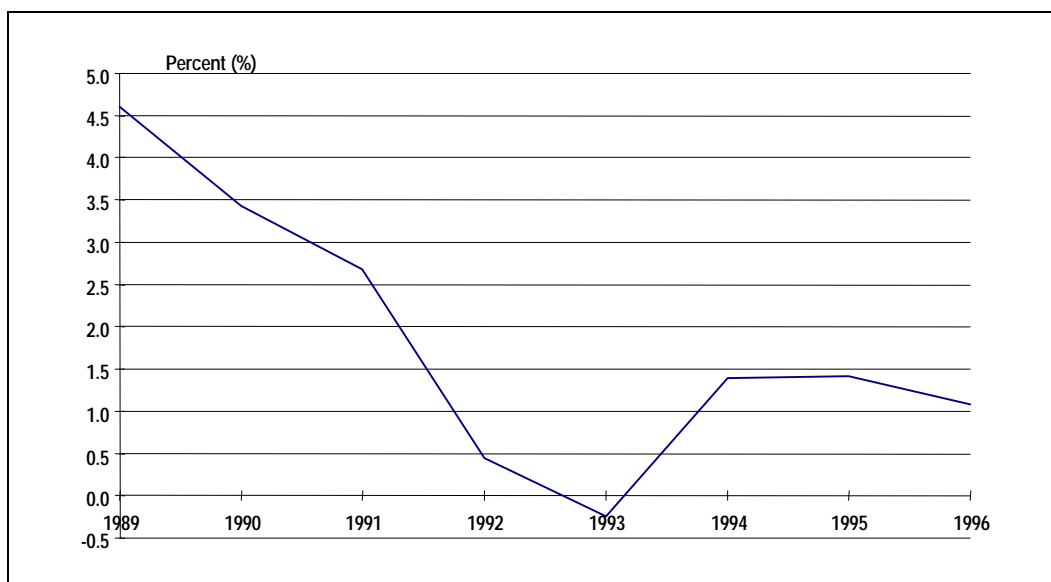
Figure 2-14: Annual Average Unemployment Rates (Canada 1987-1999)



* Estimate based on data for January through June only
Source: Statistics Canada

Employers face the same risks and these show up in financial results. Figure 2-15 documents the decline in gross margins for special trade contractors over the turbulent 1990s. Here again evidence shows that margins were forced down by the recession and recovery has not yet restored previous returns.

Figure 2-15: Special Trade Contractors, Canada Profit Margins (1988-1996)



Note: 1997 figures are currently being updated

Source: Statistics Canada, Quarterly Financial Statistics for Enterprises (61-219P)

In fact, the results reported in Figure 2-15 may be misleading without taking account of the small size of most businesses included there. Most of the small enterprises in the industry lack the financial resources to survive extended losses and most go bankrupt and leave the industry under the conditions found in the mid 1990s.

Characteristics set out here highlight the dramatic scope of change and vulnerable nature of construction in general and masonry in particular. The tenuous conditions have contributed to an unfortunate but long-standing coping mechanism — the underground economy and this is the subject of the next section.

2.5 The Underground Economy

One important structural change in Canadian construction in the 1990s has been the increase in “underground” work in construction. This is work that is concealed from tax and other regulatory authorities through practices like cash payments, falsified tax claims, income concealed from WCB and other industry assessments.

There is evidence that underground work is growing in the construction industry. A 1998 study by the Ontario Construction Secretariat (OCS) reported a 50% increase during the 1990s in Ontario. Between 1995 and 1997 the OCS reported that between 25 and 35% of all construction work was done underground and this proportion rises to 70% for residential renovation. It was estimated that governments lost between \$1.1 and \$1.7 billion in revenue. One important companion trend was a dramatic increase in self-employed construction workers. The study found that, in Ontario, the proportion of the construction workforce that is self-employed rose from 27% in 1987 to 40% in 1997. The report does not assert that all self-employed workers are using underground methods, but it observes that independent status is an important first step for concealing activity.

Canadian regulations permit workers to be self-employed under quite specific circumstances. For example, Worker's Compensation Boards and Revenue Canada require that independent workers demonstrate several aspects of their independence from employers — e.g., setting their own schedule, owning their own tools, providing materials, limited supervision and inspection. The next section documents that a growing number of masons have opted for self-employment. This affords them the opportunity to pay their own taxes, WCB assessment, EI and CPP premiums etc. If they choose (or feel obliged) to avoid these costs, the entire industry suffers.

The study explains that the underground economy is detrimental to society as it imposes an additional cost to legitimate contractors, threatens employment and safety standards, and undermines training programs and work quality.

In a national study “Strategic Analysis of Underground Employment in the Construction Industry”, prepared by KPMG Canada for the Federal government, the national building trades and key associations added further insights on the topic. According to the KPMG study, many traditional types of work, especially in the residential sector were reported to be especially conducive to underground practices because of the following factors:

- ❑ lower-skilled occupations are at greater risk of becoming involved in underground activity;
- ❑ small size of operations (e.g., one-person operations or small establishments);
- ❑ size of jobs (small projects are considered to be easier to conceal);
- ❑ duration of job (short-term easier to conceal); and
- ❑ method of payment.

Thus masonry may qualify as a trade that tends to be involved in underground activity. The reasons for this might include:

- ❑ trades in which work units are easily measured;
- ❑ work containing repetitive semi-skilled elements, lends itself to trade-contracting;
- ❑ trades with high labour content; and
- ❑ trades in which the work could be completed in short periods of time.

In fact, when the national study identified trades that are particularly vulnerable to work in the underground economy, masonry was never mentioned. This is likely because masonry work is relatively long-term and highly visible on most construction sites. Also, masonry work is less common in repair and renovation activity and the latter is a major source of underground work. Where masonry restoration work is done, it is often long-term and highly visible. Other characteristics of underground work clearly do apply to masonry. There is no further documentation of the extent of underground work in the masonry trades.

The Governments of Canada and Québec have stepped up their efforts in programs designed to combat the underground economy. Actions have included the recruitment of larger investigative and audit staffs, the imposition of new or increased penalties for failure to adhere to regulations, public awareness initiatives, review of public works tendering and contract administration procedures.

2.6 Labour Market Profile

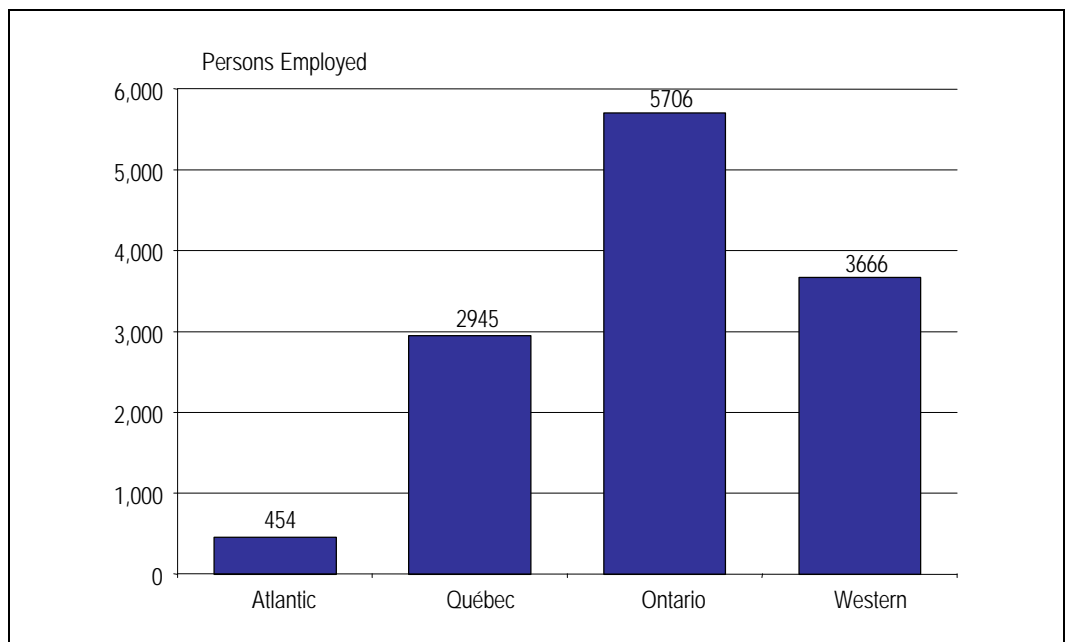
There are two sources for data on masons and tilesetters: secondary information collected by Statistics Canada and the primary data collected from the survey used for this study. This part of Section 2 reviews secondary data on labour markets for the masonry trades. The data describes broad trends, characteristics and patterns for workers. Many aspects of the trade will be considered in more detail using information from the survey in Sections 4 and 5.

One important source of secondary labour market information for masonry is the monthly Labour Force Survey conducted by Statistics Canada. The survey tracks the total labour force for masons and tilesetters (all respondents available for work), those employed and unemployed. This measure has several advantages, including comparisons to other trades, all construction and the entire workforce. Data has been collected over many years permitting a historical perspective on both seasonal and cyclical volatility. This information is updated monthly and provides a convenient way to stay current on developments. The 1996 Census also provides key data on age and other characteristics.

Key Structural Characteristics

Figure 2-16 presents the distribution of masons and tilesetters among provinces.

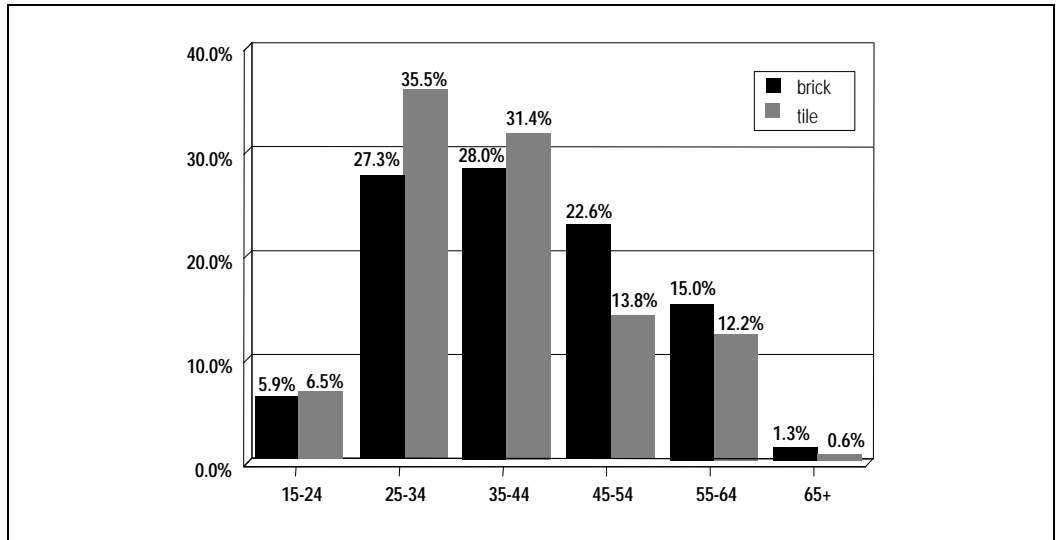
*Figure 2-16: Brick, Stone Masons and Tilesetters
Geographic Distribution According to 1997 Employment*



Source: Statistics Canada, The Labour Force Survey

Figure 2-17 reviews the age profile for masons and tilers. The comparison shows that the bricklayer population is older than the overall construction workforce with fewer young people, just 5-6%, and a large number of workers in the crucial 45-64 age groups. This group is likely to retire in the coming ten years. Figure 2-17 also shows the equivalent data for tilers and conveys a different picture with a moderately greater concentration of workers in the key 25-44 age group. These profiles imply that large numbers of the trades will be retiring in the coming decade and few young people are available to replace them. Thus, large numbers of recruits are needed to take their place.

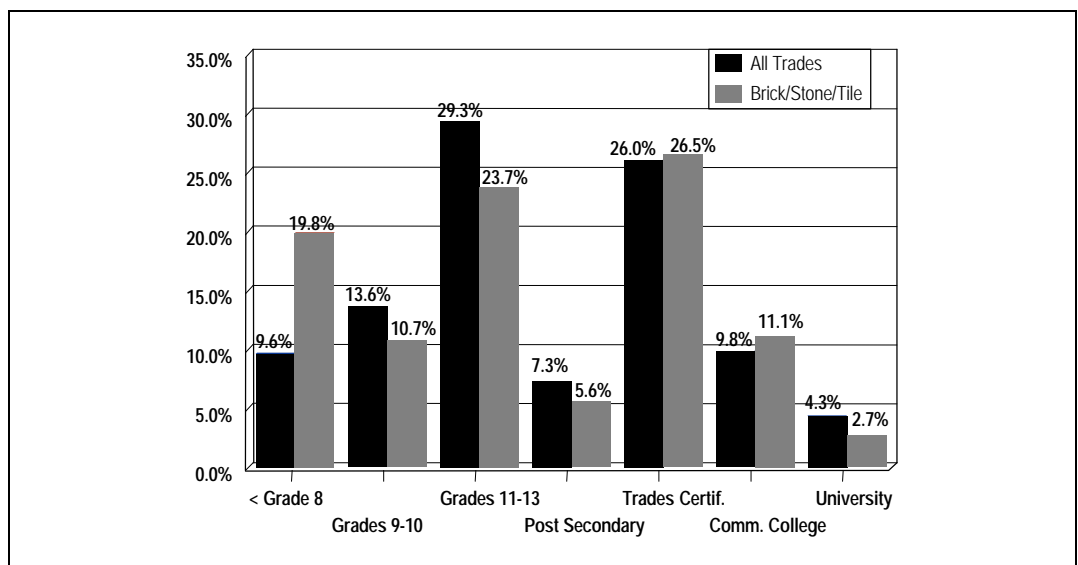
Figure 2-17: Age Profile of Masonry Trades



Source: 1996 Census

Figure 2-18 reviews the educational achievement of the masonry workforce. Over half of the masons have not completed high school and over one-third have trade certification or community college training. These results are essentially consistent with the results for all construction trades taken together.

Figure 2-18: 1997 Education Attainment



Source: Labour Force Survey

As noted in the preceding section, there has been a remarkable trend to self-employment among all construction trades. Figure 2-19 tracks this change for masons. Equivalent data for tilesetters is not available due to the smaller sample size. There is a marginally larger shift to self-employment among masons. This may be related to a combination of circumstances, including the severe recession in the trade and the prevalence of piece-work in job sites. This evidence also reinforces that observation in the last section that masonry workers may be vulnerable to pressure to work underground.

Figure 2-19: Self-employment Among Masons and all Construction Trades

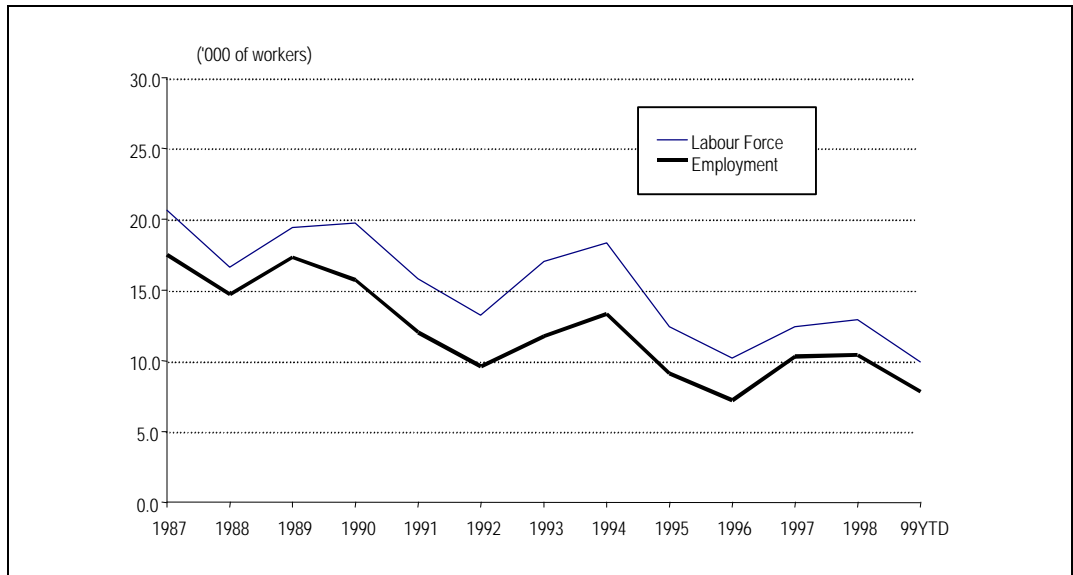
Trade	1987 (%)	1998 (%)
<i>Masons</i>		
Paid Employment	85	75
Self-employed	15	25
<i>All Construction</i>		
Paid Employment	78	70
Self-employed	22	30

Seasonal and Cyclical Features

We now turn to the Labour Force Survey for a review of the cyclical character of construction employment and masonry trades in particular. Three measures track the flow of workers across the cycle. The labour force data measures the total number of workers that are seeking work, while employment measures those working (both part and full time) and unemployed captures the remainder. Note that these measures are broadly-based, and that they offer a limited view of the migration of workers out of the trade and into other industries and employment during the recession, and the return of these workers during the recovery. This data also fails to capture the importance of hours worked in construction. Most workers experience regular gaps between jobs and this makes it difficult for annual hours to rise above a ceiling of 1600-1700.

The analysis is refined later in the report to take account of these factors. The main advantage of the Labour Force Survey for the present purpose is to track adjustment through time in the masonry workforce.

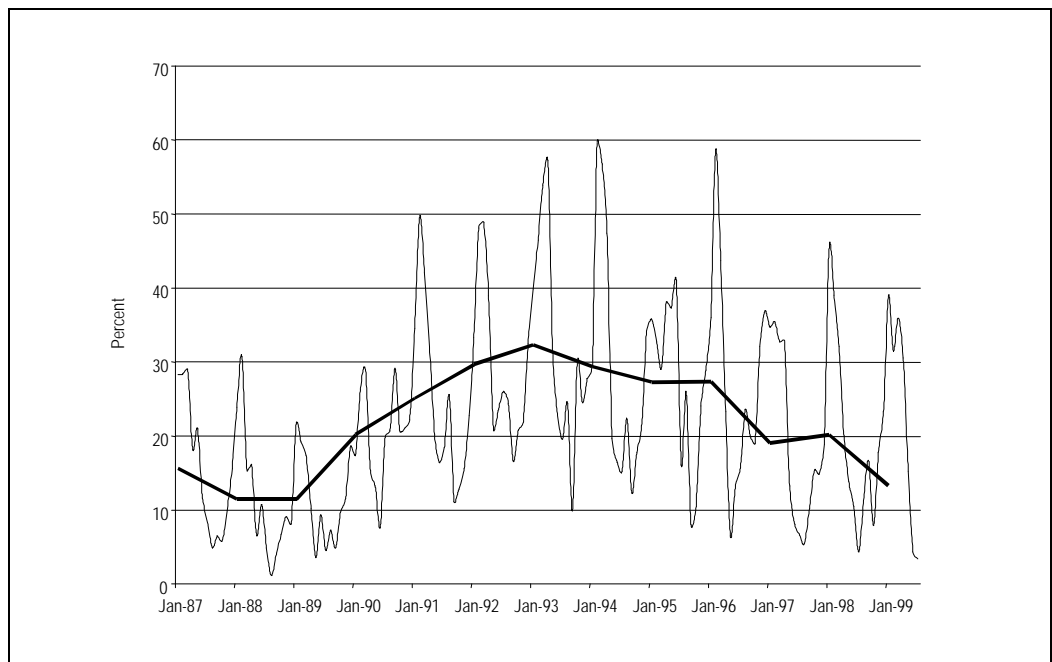
*Figure 2-20: Total Bricklayer Labour Force and Employment
(Canada, 1987-1999)*



Source: Statistics Canada

Figure 2-20 reports the annual level of the labour force and employment in masonry from 1987-1998. There were extra-ordinary peaks and troughs with both measures falling by almost half over the 11 years from 1987-1998. Roughly 10,000 workers disappeared from the trade, leaving anywhere from 2,500-10,000 workers unemployed. Figure 2-21 tracks the unemployment rate. There are violent swings through the years from a peak of over 30% to a current low near 10%.

Figure 2-21: Masons Unemployment Rate (1987-1998, Annual)



This data also serves to highlight the fluid nature of the workforce. Extensive mobility is featured with well over half of the workforce either unemployed or out of the industry for extended periods. This remarkable ebb and flow raises basic questions about the manner in which workers might identify with the trade and be willing to seek training, certification or upgrade courses given the unreliable nature of the work.

Figure 2-21 presents a variation on the unemployment information adding the rate for all construction with the monthly, unadjusted rate for masonry. This adds in the further dimension of seasonal fluctuations. These shifts regularly move one-quarter to one-third of the workforce out, during the winter months and back in during the summer.

A final observation from the Labour Force Survey would note that the current state of the masonry industry is somewhat improved, but lags behind the overall recovery in construction. The unemployment rate has been falling steadily since 1993 and is, in early 1999, reaching the low point of the late 1980s. Employment improved modestly during 1998, although it has slipped back in early 1999.

In contrast, measures for the broader construction industry have shown much more dramatic improvement. Employment of all trades in construction is up over 60,000 from the last trough in 1995 and is within 25,000 of the overall peak. But, as Figure 2-22 shows, brick and tile workers are losing their share of construction employment. Indeed, for some trades, employment is now passing previous peaks and extensive shortages are reported.

Figure 2-22: Share of Construction Employment by Selected Trades

Trades	Employment (1987)		Employment (1998)	
	000s	%	000s	%
Plumbers	20.4	4.0	20.6	3.9
Carpenters	81.7	16.3	71.7	13.8
Masons	17.5	3.4	10.4	2.0
Tilesetters	3.7	0.7	2.3	0.4
Roofers	8.2	1.6	10.8	2.1
Painters	24.3	4.8	29.1	5.6
Sheet Metal Workers	10.2	2.0	8.3	1.6
Electricians	34.0	6.8	30.5	5.9
Heavy Equipment Operators	33.2	6.6	32.0	6.1
Labourers	69.7	13.9	74.0	14.2
Total Construction	500.0		520.0	

Source: Labour Force Survey, Employment in Construction, 1998

2.7 Conclusions

This section of the report has reviewed statistical measures that characterize the masonry industry. A series of challenges are described that include:

- the industry faces intense competition and a weak market;
- workers and contractors face significant risks and the magnitude of changes imposed on the industry has been large; and
- various options have been described, including temporarily leaving the industry, the underground economy, self-employment and shifting to new markets. Adapting to these challenges has kept the industry off-balance and more constructive strategies are needed.

Information used for this section is drawn from secondary sources and it does not probe deeply into the workings of the industry. The balance of the report draws on surveys, interviews and research that targeted more in-depth insight and ideas.

3. Labour Demand and Supply

Key Findings

- Projections of demand for masonry trades identify upper and lower bounds from 1999-2008.
- The upper bound is based on strong economic growth of 2.5% to 3.0% — the lower bound includes a recession in 2000-2001 and a weak recovery from 2002-2008.
- Projections of demand for masons are adjusted downward to reflect displacement of masonry in various markets.
- Prospects for masons range between a short-term gain of roughly 5,000 jobs to a loss of up to 5,000 jobs in recession.
- Prospects for tilesetters are for stronger growth; adding as many as 2,000 jobs by 2008.
- Projections of supply depend on the age structure of the current workforce, entry and exit.
- A large number of masons aged from 45-54 will leave the trade between 2000 and 2008 causing an overall decline of about 1,500.
- Tilesetters are younger and should sustain their ranks by attracting new entrants.
- Current levels of apprenticeship registration will not meet the expected demand.
- In spite of weak demand and a trend decline in employment, there is a risk that large numbers of skilled workers will be lost in the next ten years.
- Training capacity and certification need to be improved to meet this challenge.

This section of the report considers the likely future path of the demand for and supply of masonry workers. Demand side analysis is presented in Section 3.1 by developing two scenarios for construction activity and related labour needs. The supply side is presented, in Section 3.2, as the extension of demographic analysis that considers the impact of the aging of the workforce and likely patterns of entry, exit and migration.

These two components are then brought together to evaluate possible future periods of excess supply and rising unemployment or shortages of specific skills and work experience.

3.1 Projections of Demand: 2000-2008

This section of the report presents a series of projections of demand for masons and tilesetters. These projections are one component of planning for the human resource needs of the industry.

There are, of course, very large potential errors in forecasting. Two scenarios are presented here to reflect the high and low boundaries of likely demand. This range is chosen to illustrate the limits of labour requirements and to identify the extremes within which the industry must plan human resource development. It is not intended that a single “forecast” will identify the exact number of workers required in the future.

The challenge then, is to design recruiting, training and certification systems for the next decade so that there will be a proper balance in workers required and available. A human resource planning system should seek to minimize costs and maximize benefits to both employers and employees. Employers benefit when the needed skills are available with limited recruiting and when the workforce reduces installation errors and improves customer service. Workers benefit when unemployment is minimized and earnings are maximized.

Human Resources Development Canada (HRDC) has offered assistance to all the National Sectoral Adjustment Services committees to develop these labour demand scenarios. HRDC has contracted with Informetrica Ltd. to prepare national and provincial projections of the construction activity from 1999-2008. These projections measure the value of new construction by asset type. A further adjustment is required to convert these value projections into labour requirements in the form of either jobs or hours. The “Dalcor” model provides this next calculation by applying a series of technical coefficients that translate construction value into hours required by trade.⁶

⁶ The “Dalcor” model was originally developed by Dalcor Innoventures of Edmonton. This model has been used for many years to analyze the labour requirements of individual construction projects as well as provincial or national needs. Earlier work with this model for other trades often found gaps and out-of-date calculations. To remedy this, HRDC has contracted with John McDougall of Dalcor to update the coefficients for all trades.

Informetrica organized a meeting of construction NSAS committees in 1998 to review the process of scenario building and labour demand projections. Two scenarios for construction activity emerged from these discussions; representing the lowest and highest expected path for construction spending both nationally and by province. These cases have been used by several other trades in their human resource needs analysis. Some basic indicators for these two cases are presented in Figure 3-1.

Figure 3-1: Key Indicators from the Informetrica Base Case and Recession Scenarios Construction GDP, Construction by Type — Annual Growth 1999-2008

Indicator	Base Case	Recession Case
Construction GDP	2.4%	1.2%
Residential Construction	2.2%	-1.0%
Non-residential Construction	2.4%	0.5%
Construction Employment	1.5%	0.3%

Source: Informetrica Ltd.

The Base Case captures the likelihood of a continuing expansion in construction, with the improvements in activity from 1996 through 1998 period extended over the next ten years. Construction employment steadily improves; passing the previous 1989 peak in 2001 and continuing to grow until 2008.

In the Base Case, general economic activity is strong with overall growth averaging between 2.5 and 3.5% from 1999-2008. Unemployment gradually falls below 7.0% and commodity prices rise. This strength supports continuing demand for new structures in most economic sectors and, in particular, growth in resource-based activity in Western Canada. Residential building is encouraged by the backlog of households seeking accommodation and low vacancy that remains in many communities. Housing starts grow steadily; reaching over 180,000 in most years after 2000.

Construction activity in the base case is evenly distributed across market segments and among provinces. There is a gradual shift in emphasis to resource-based activity. Repair and renovation activity expands more rapidly than other types of construction; continuing a pattern set in the mid-1990s. There is also an equivalent convergence of economic growth across provinces. More balanced activity would increase demand for construction labour in all provinces and act to discourage mobility across provinces.

Construction employment for all trades is driven by this pattern of strong and steady expansion. Total, national employment expands steadily and passes the previous peak of 825,000, set in 1990, in 2001. All trades and segments grow with trades like floor covering, roofing, labourers, plumbers and electricians expanding more rapidly due to their exposure to the repair and renovation markets. Employment growth lags the expansion in total building volume (e.g., square

footage of building in industrial and commercial and housing starts in residential) due to an assumed improvement in productivity or output per unit of labour input. All scenarios assume the productivity in construction improves by 1% per year. This is equivalent to saying that labour requirements for building the same structures will decline by roughly 10% over the next ten years.

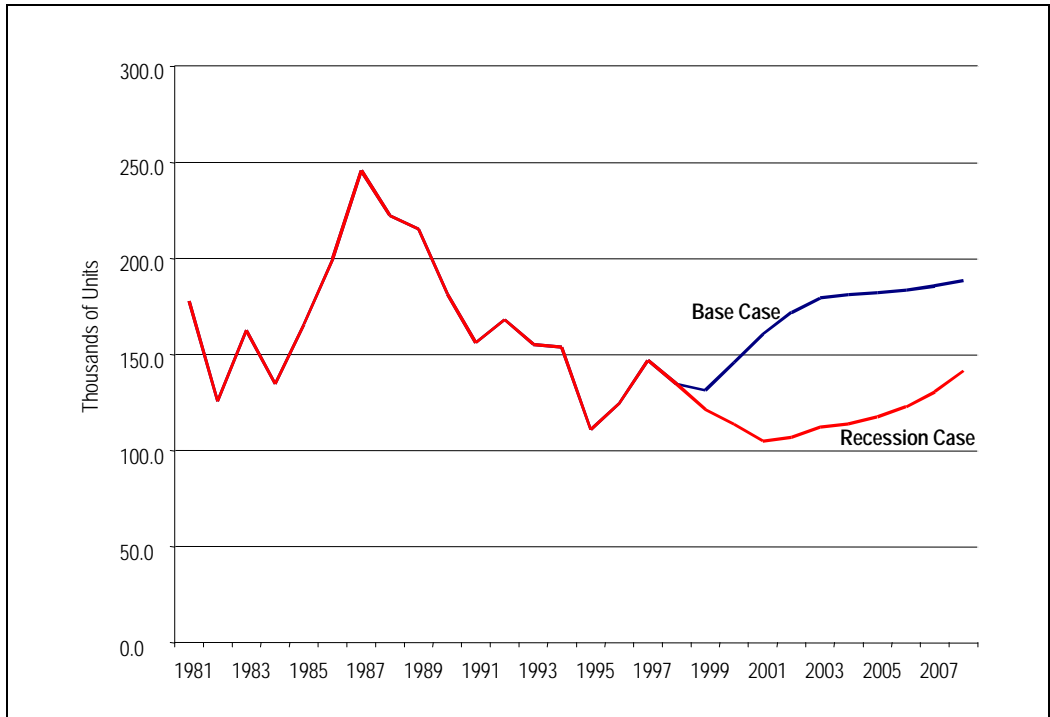
The Recession Case represents risks to Canada's general economic prospects over the 1999-2008 period. Two major negative possibilities are anticipated here. First, conditions in Asia are assumed to continue to deteriorate as financial institutions there do not restore stability or investor confidence. This has a primary impact on Canada through lower commodity prices and weaker demand for exports from the Western Provinces to the Pacific Rim. Second, the United States enters a period of weak growth due to excessive levels of consumer debt and a drop in asset prices. This U.S. recession begins with an increase in interest rates that is prompted by fears of renewed inflation. Higher rates drive down the stock market, reduce household confidence and weaken U.S. imports. The primary impact on Canada is through weaker exports from Ontario and Québec.

Under these circumstances economic activity in Canada declines through the year 2000 and then begins a very slow improvement. A weak expansion from 2002-2008 leaves the unemployment rate above 10% and growth more than 1% below the Base Case. Construction activity is vulnerable in this situation and housing starts are weak; remaining below or near 150,000 from 1999-2008. Commodity prices are weak and this limits the expansion of resource facilities in the west and in Atlantic Canada. The Recession Case is particularly severe in British Columbia and Alberta where both the U.S. and Asian markets are lost.

Construction employment declines in 2000 and 2001 and then remains between 50,000 and 75,000 jobs below the Base Case levels until 2008. The same productivity assumptions are made on the Recession Case as in the Base Case — a 1% annual gain.

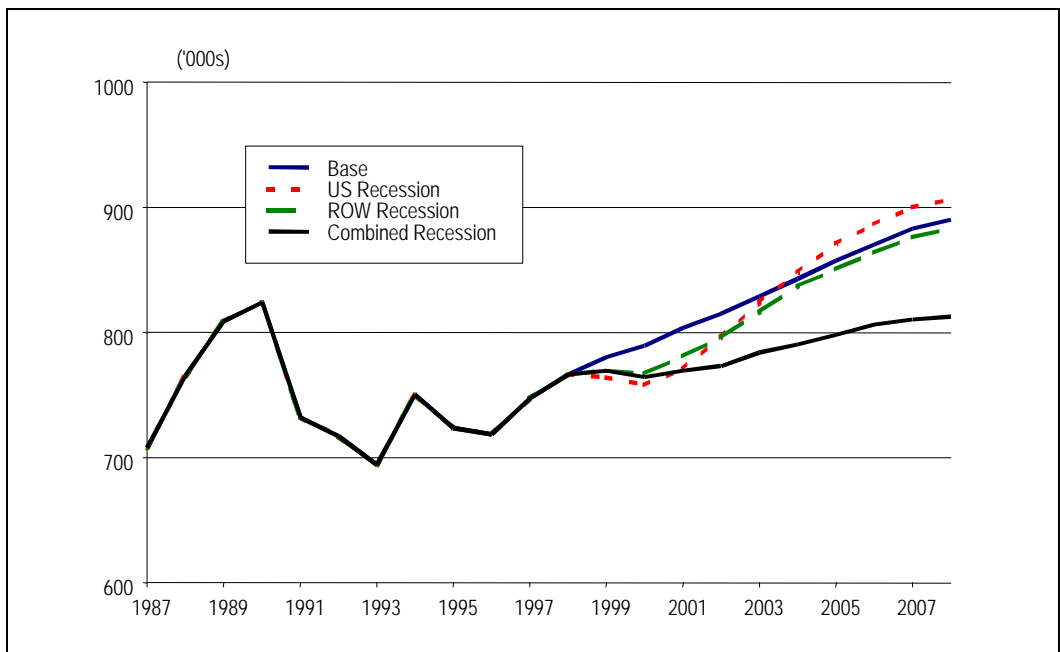
Figure 3-2 captures the pattern of the two scenarios for housing starts. The range of projected outcomes is set such that the upper and lower limits correspond to the historical limits. Thus the scenarios illustrate that housing activity might be expected to range between 150,000 and 180,000 over the next ten years. There are equivalent projections for economic drivers of construction across industries and provinces in all the projections. The result is a series of labour market projections that represent the upper and lower limits of likely conditions. Figure 3-3 captures this range.

Figure 3-2: Housing Starts Base and Recession Cases (Canada)



Source: ARA Consulting Group, a division of KPMG Consulting LP

Figure 3-3: Construction Employment (Canada, 1987-2008)



Source: ARA Consulting Group, a division of KPMG Consulting LP

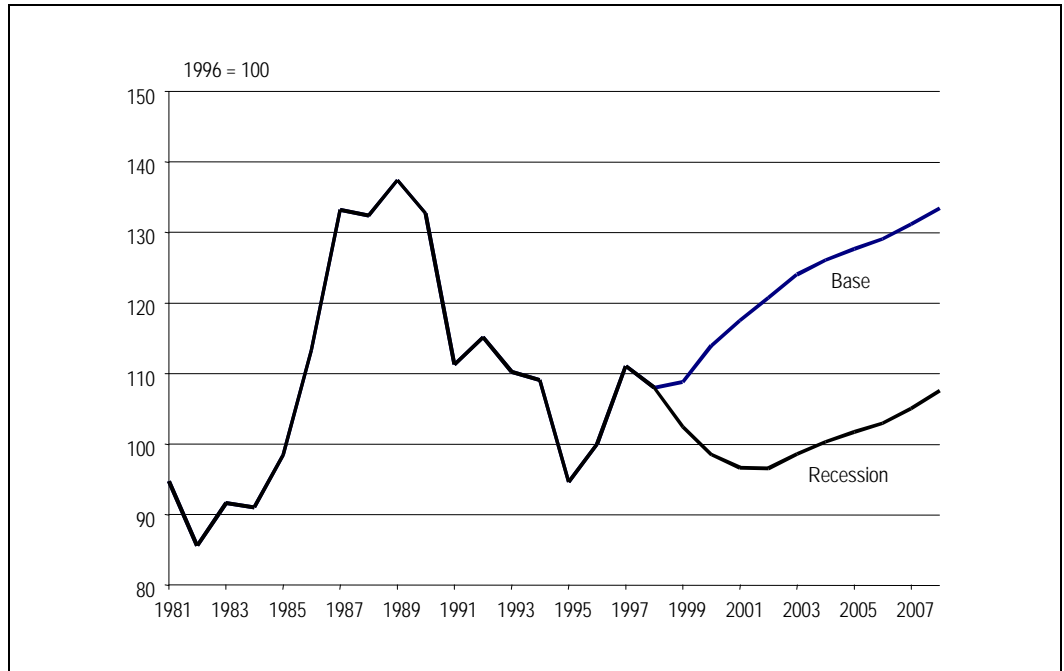
There are many likely patterns of economic activity that would fall between the two extremes over the 2000-2008 period. Two simulations, prepared by Informetrica are included in the figure to represent these situations. In these cases the economy would fall into a recession in 2000 and then recover in the 2001-2002 period. Recent data is suggesting a different near term pattern of strength in the economy that is carrying activity past the upper limit of the Base Case and perhaps even exceeding expectations.

The final step in the process is to calculate the equivalent paths for the masons and tilesetter trades. Projections for masons have been adjusted to reflect a continuing loss of market share as well as rising productivity. Analysis presented in Sections 2 and 7 describe a pattern of weak demand for masonry work and this has been extended into the future here through an assumption of a 2% annual loss of masonry labour demand, given the overall expected level of construction activity. This means that bricklayer labour requirements for the same overall amount of construction will be reduced by 20% or more ten years from now. There is no equivalent adjustment for tilesetters, as there is no similar evidence of declining demand or work displacement.

Figure 3-4 shows the expected upper and lower limits for employment of masons. In the Base Case, the projection would anticipate a brief slump in employment in 1999 and recovery in 2000-2001, with the addition of up to 5,000 jobs during the coming years. The Recession Case anticipates an extension of the slump in the 1990s with the loss of perhaps 2,000 to 5,000 more jobs between 2000 and 2008. The implication, then is that demand for masons will likely move within a range of 6,000 and 12,000 workers over the next ten years.

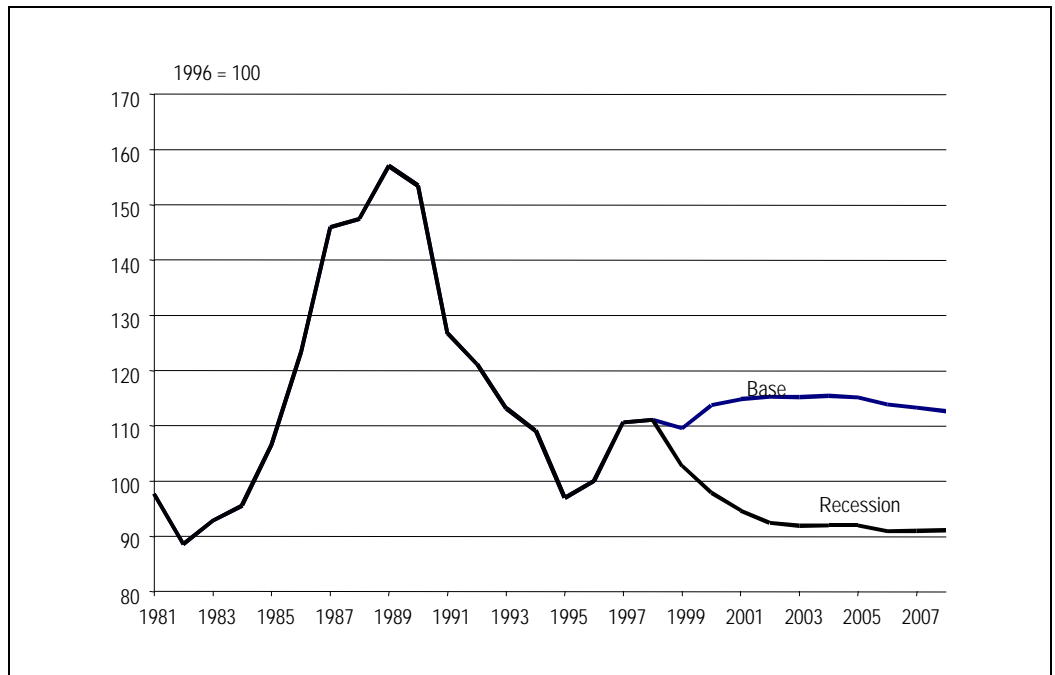
Prospects for tilesetters in Figure 3-5 are better. Projections anticipate growth in the Base Case of 2-4% annually with the addition of between 1,000 and 2,000 workers. This would return employment in the trade to the 1990 peak of 4,700. The Recession Case would see a decline in tilesetter employment to around 1,500 in the next two years and a recovery to current levels.

Figure 3-4: Index of Hours Worked — Masons (Canada, 1981-2008)



Source: ARA Consulting Group, a division of KPMG Consulting LP

Figure 3-5: Index of Hours Worked — Tilesetters (Canada, 1981-2008)



Source: ARA Consulting Group, a division of KPMG Consulting LP

3.2 The Supply Side

The workforce that will be available to meet this demand will be determined by the existing pool, new entrants and exits. Sections 2 and 4 present data on the age distribution of the current workforce and emphasize the generally higher average age of masons. Almost one-third of the masons are over 45 and will likely leave the trade over the next ten years. The situation for tilers is less critical as only 20% are in this age group; leaving a younger workforce to meet coming demands.

The consulting team has built a model of the workforce that projects numbers over the period 1999-2008. Calculations take account of entry — both through workers rejoining the market and new apprentices — and exit, usually by retirement. Figure 3-6 summarizes the results of these calculations.

Figure 3-6: Workforce Projections, Masons and Tilers

Year	Bricklayer Workforce	Percent Change	Average Age	Tilers Workforce	Percent Change	Average Age
1999	12,767	-1.7%	40.8	4,434	-1.9%	38.8
2000	12,570	-1.5%	41.0	4,380	-1.2%	39.1
2001	12,391	-1.4%	41.2	4,344	-0.8%	39.5
2002	12,230	-1.3%	41.4	4,319	-0.6%	39.8
2003	12,081	-1.2%	41.6	4,299	-0.5%	40.2
2004	11,936	-1.2%	41.8	4,284	-0.4%	40.6
2005	11,785	-1.3%	42.0	4,271	-0.3%	41.0
2006	11,621	-1.4%	42.2	4,256	-0.4%	41.4
2007	11,449	-1.5%	42.4	4,237	-0.4%	41.8
2008	11,269	-1.6%	42.6	4,214	-0.5%	42.1

Source: ARA Consulting Group, a division of KPMG Consulting LP

Analysis presented in Section 2 indicates that there is considerable flexibility in the labour force. During 1993 for example, over 3000 workers joined the workforce in response to improving demand, but then as many as 5,000 left in 1995 as the recession resumed. Within these wide boundaries, the supply gradually declined, largely in response to weak demand so that by 1998-1999 roughly 8,000-10,000 fewer workers were employed.

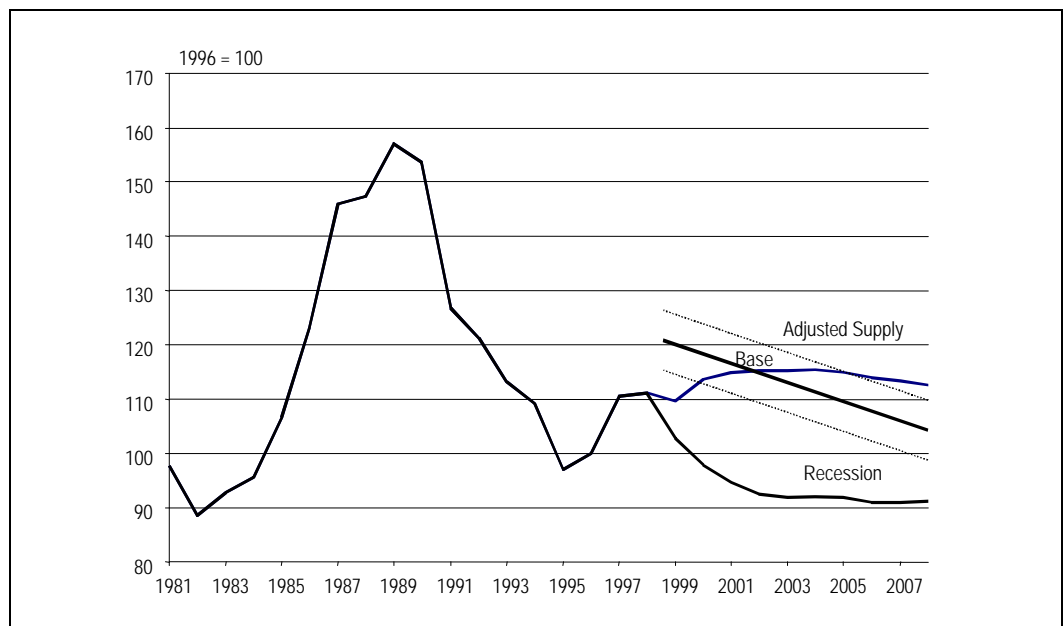
The cyclical responses of the 1990s are not included in the projections in Figure 3-6. Demographic trends alone are expected to reduce supply by 1,500 masons and 200 tilers. This reduction allows for retirements at past rates for workers as they reach the 55-64 age bracket. New entrants join the ranks at the rate of 300-350 masons and 100 tilers per year. *Note that the majority of these would be either unskilled workers or returning tradespeople as the past and expected rate of apprentice admissions, between 100 and 200 each year in the case of masons, would not be adequate to meet these numbers.* This latter situation is reviewed in Section 8.

Additional hours of work, among the existing workforce, are a further source of new supply. Weak market conditions have reduced hours and a gain of 10% or more is possible within the existing workforce. This gain might offer some modest offset for the losses noted in Figure 3-4 but it is also possible that exits will exceed those assumed. The overall trend to a lower workforce remains the key conclusion of this analysis.

Figures 3-7 and 3-8 highlight the main risks for the coming ten years. Each diagram represents the combination of demand projections from Figures 3-4 and 3-5 with the supply side calculations in Figure 3-6. The expected slow reduction in the workforce shown there is translated into an index number and appears as a straight line across the 2000-2008 period on a declining trend.

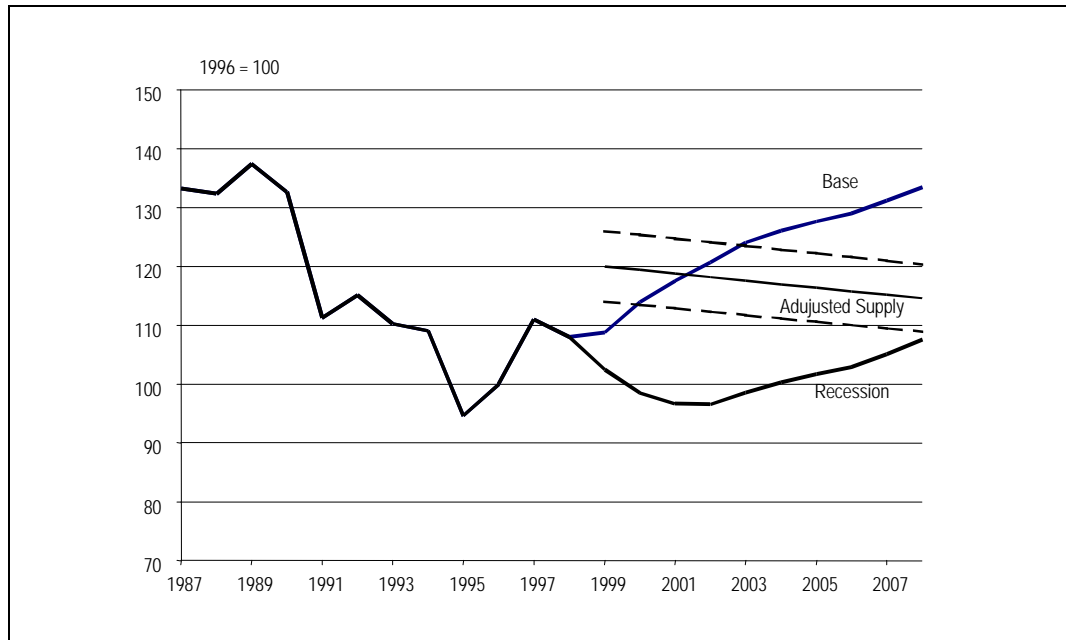
As the supply is reduced by retirements and the minimal backlog of apprentices in the system, the risk of chronic skill shortages increases. Current conditions have already brought us to a cyclical peak and it is likely that employment will grow along the upper limit of the demand scenarios for the next year or so. As time passes and demand outpaces supply, the issues of skill needs will become acute. The Recession scenario, that was considered a real threat just 12 months ago, may provide a needed break in the cycle and offer a chance for new entrants to be trained and prepared for work. In the mean time, the evidence suggests that demand will be met with uncertified masons and tilesetters, and that there would be an associated risk of poor quality construction and work place accidents.

Figure 3-7: Index of Hours Worked — Masons (Canada, 1981-2008)



Source: ARA Consulting Group, a division of KPMG Consulting LP

Figure 3-8: Index of Hours Worked
Tilersetters (Canada, 1981-2008)



Source: ARA Consulting Group, a division of KPMG Consulting LP

3.3 Conclusions

This section has considered the future for the masonry trade in a series of projections of the available workforce and the demand for hours. The key conclusions include:

- Two scenarios bracket the range of future demand for masonry hours — a more optimistic, Base Case where hours grow from current levels until the 2004-2005 period and a pessimistic, Recession Case where a decline in construction limits demand.
- There is a general risk of a downward trend in masonry hours due to the expected displacement of masonry materials by other forms of cladding, walls and applications. The outlook for tilersetters is better.
- A range of +/- 5,000 workers sets out the expected future levels. Plans for the masonry workforce must accommodate activity within these bounds.
- The average age of the workforce is over 40 and retirements and withdrawals will reduce supply unless the number of new entrants is increased. A projection using recent past trends in exit, entry and withdrawal shows a decline of 1,500 or more masons. Tilersetters are younger and the risk of retirement or withdrawals is less.
- These projections indicate that there is a reasonable risk of shortages in masons during the period from 2000 to 2008. This means that plans must be made to recruit and train a new generation of skilled masons to meet the expected demands.

4. Workforce Profile: Masons

Key Findings

- The average age for unionized workers is 44 years old, compared to 38 years for non-union workers.
- Immigration is not a likely source for future workers.
- There is evidence that certification is declining among younger workers.
- Employability is enhanced when there is a proficiency in two to three of the major work activities.
- Mobility is more prevalent among older workers, over the age of 45 years.

Section 2 presented an overview of the industry and workforce profile based on secondary sources. To expand on this information, the study team prepared and distributed a detailed questionnaire, and a total of 770 masons responded. This section reports on these results in areas such as age distribution, worker mobility and certification. Where it is possible to compare findings from the survey with other sources, this is done to validate and expand on the findings. In particular, the Commission de la construction du Québec (CCQ) prepares detailed statistics on the construction workforce in that province and this provides an excellent reference point.

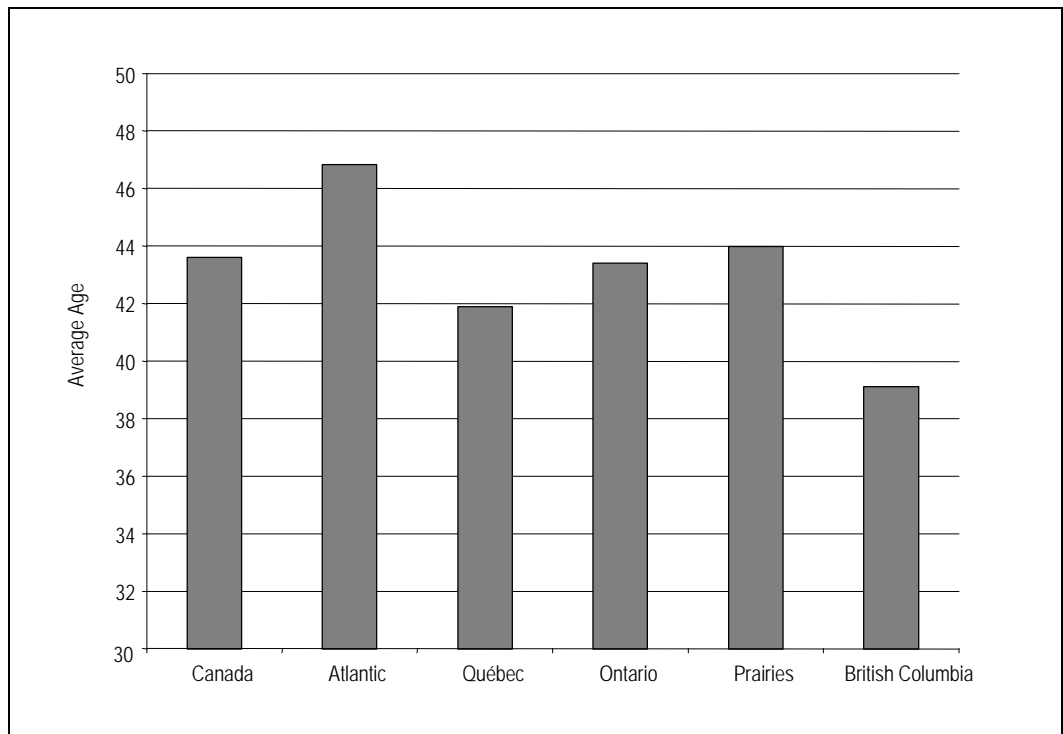
A similar survey was prepared and distributed to tilesetters but the response rate was insufficient to produce statistically significant results.

4.1 Age Structure

Figure 4-1 compares average age data for masons and stone masons across Canada using data from the workers' survey. The average age of unionized workers (44 years of age) is significantly higher than the average age of non-unionized workers (38 years of age). In general this result is higher than similar data for other trades, where a typical age spread between union and non-union is about five years.

The sample is notably older in Atlantic Canada. CCQ data for masons in Québec in 1996 shows an average age of 41, confirming the survey findings. British Columbia's workforce is younger.

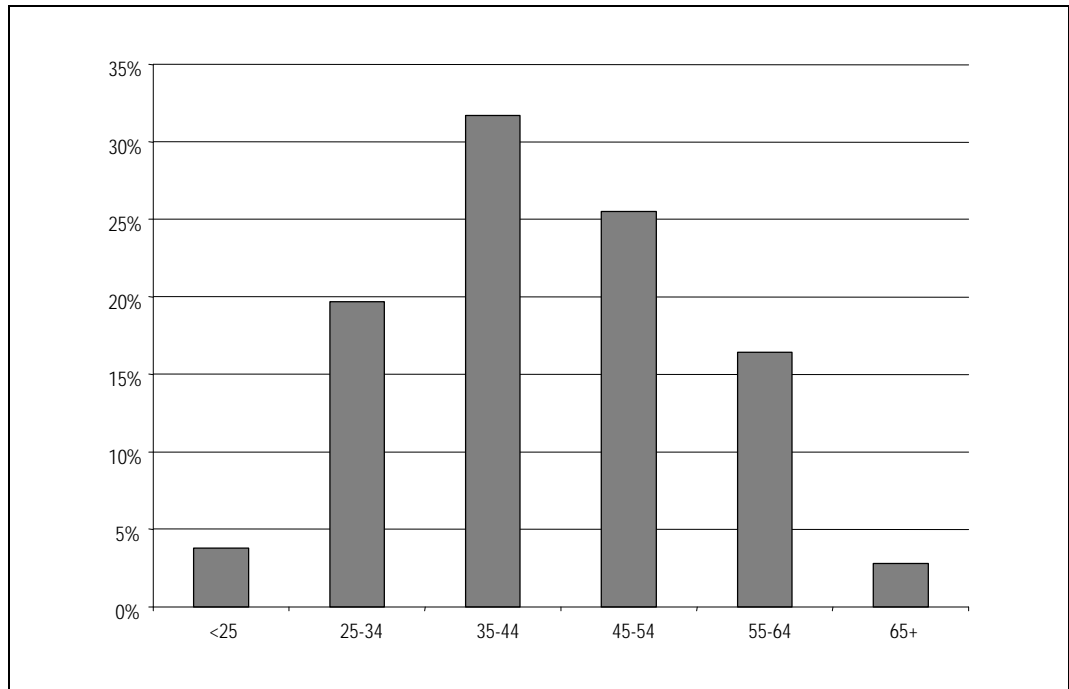
Figure 4-1: Average Age of Masons and Stone Masons



Source: 1998 Workers' Survey

Figure 4-2 illustrates the age distribution for workers. The low share of workers under the age of 25 suggests that the flow of new entrants may not be sufficient to compensate for those leaving the workforce in the near future.

Figure 4-2: Age Distribution for Masons and Stone Masons



Source: 1998 Workers' Survey

4.2 Role of Immigration

According to the workers' survey, nearly 25% of masons and stone masons were born outside of Canada.

The regional breakdown, in Figure 4-3, shows that immigration is relatively more important in Central and Western Canada. In the Prairies, Saskatchewan has a low proportion of immigrant masonry workers (less than 5%), while Manitoba and Alberta employ a substantially higher proportion of immigrants.

Figure 4-3: Regional Distribution of Immigrants in Masonry and Stone Masonry

Province	% of Workforce Born Outside of Canada
Atlantic	7.6%
Québec	3.9%
Ontario	31.7%
Prairies	26.1%
British Columbia	20%

Source: 1998 Workers' Survey

Further analysis of the survey data for immigrant workers reveals that few of these immigrants (only 10%) are under the age of 40, while most (over 65%) are over the age of 50. Furthermore, over 40% of the immigrant masonry workers who are over the age of 50 were born in Italy. Younger immigrant masonry workers, who are under 40 years of age, appear to be emigrating from a variety of countries, with no home country dominating.

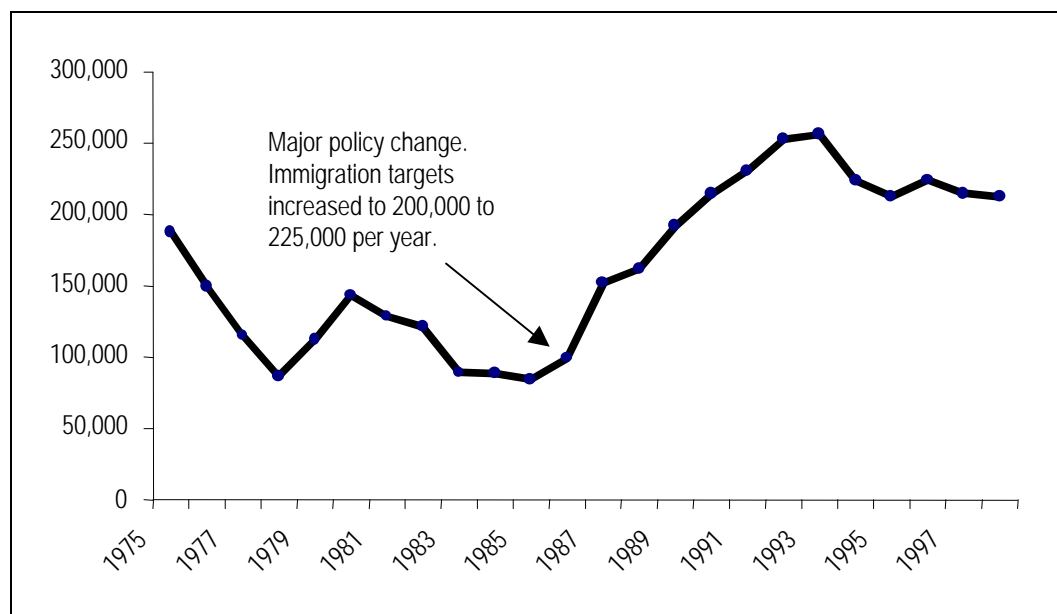
In summary, immigration has played a more critical role as a source of labour supply in some areas of Canada relative to other areas. The immigrant portion of the workforce consists of mostly older workers who will be retiring within the next ten years. There does not appear to be sufficient numbers of younger immigrant workers at this time to offset the shortages that will occur when older immigrants retire. The industry will have to rely on domestic sources of labour or else make efforts to attract more immigrants to the trade.

The impact of immigration on the supply of masons is determined by four factors:

- overall levels of immigration;
- the proportion of immigration that is employment-oriented;
- the proportion of employment-oriented immigrants who will pursue construction masonry following settlement; and
- the regional distribution of immigrant settlement.

Commencing in the mid-1980s, the federal government substantially increased immigration into Canada. Figure 4-4 illustrates the trend in total immigration.

Figure 4-4: Immigration of All Types (1975-1998)

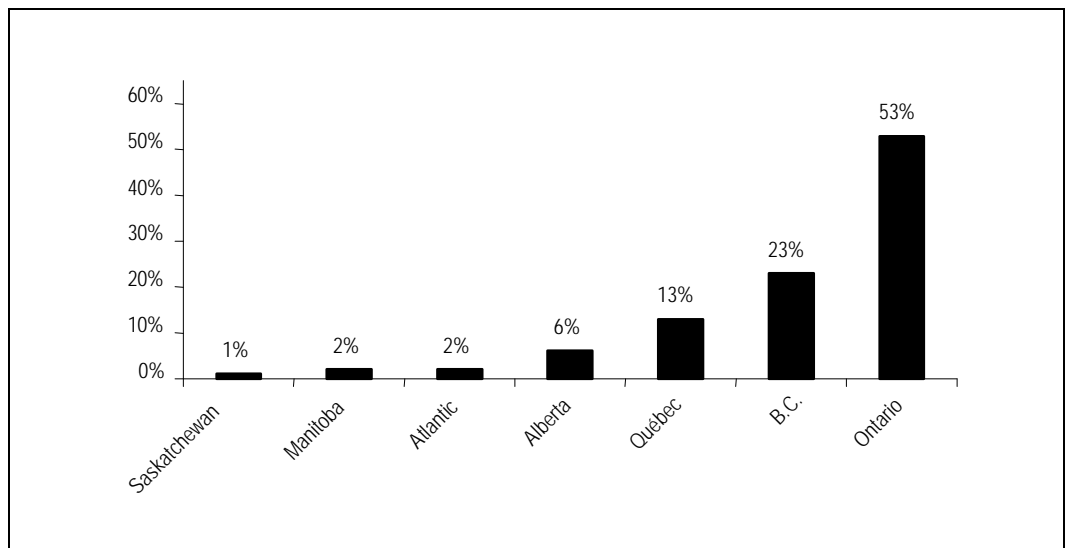


Source: ARA Consulting Group, a division of KPMG Consulting LP

Approximately 50% of immigrants are employment-oriented. Masonry workers represent less than 0.50% of the Canadian labour force. Estimating the impact of immigration on the supply of masons requires appraising three factors. First, construction has historically supplied a disproportionate share of employment for new immigrants. Second, a greater proportion of recent immigrants have post-secondary qualifications which do not lead to employment in construction. Third, recent immigrants are increasingly drawn from countries which have not historically been sources of construction workers in the Canadian labour market. Taking these three factors into account, the Labour Supply Model assumes that immigrants who will enter construction masonry will average 0.5-1.0% of employment-oriented immigration.

It is important to note, however, that there are sharp regional differences in the impact of immigration on labour supply. Figure 4-5 shows the pattern of settlement by province. Notice that this pattern for regional settlement by immigrants differs from the distribution of immigrant masons shown in Figure 4-3. It seems unlikely that the traditional source and pattern of immigration of masons will help to fill the ranks of the trade in the future.

Figure 4-5: Share of Immigration Settlement by Region or Province



Source: ARA Consulting Group, a division of KPMG Consulting LP

4.3 Education and Certification

Results from the workers' survey indicate that nearly half of all masons and stone masons have completed less than 12 years of formal schooling, while nearly 40% have completed 12 years of education. There is a trend for the younger workers to have more formal education, with most having high school diplomas, while the older workers have a lower level of academic achievement.

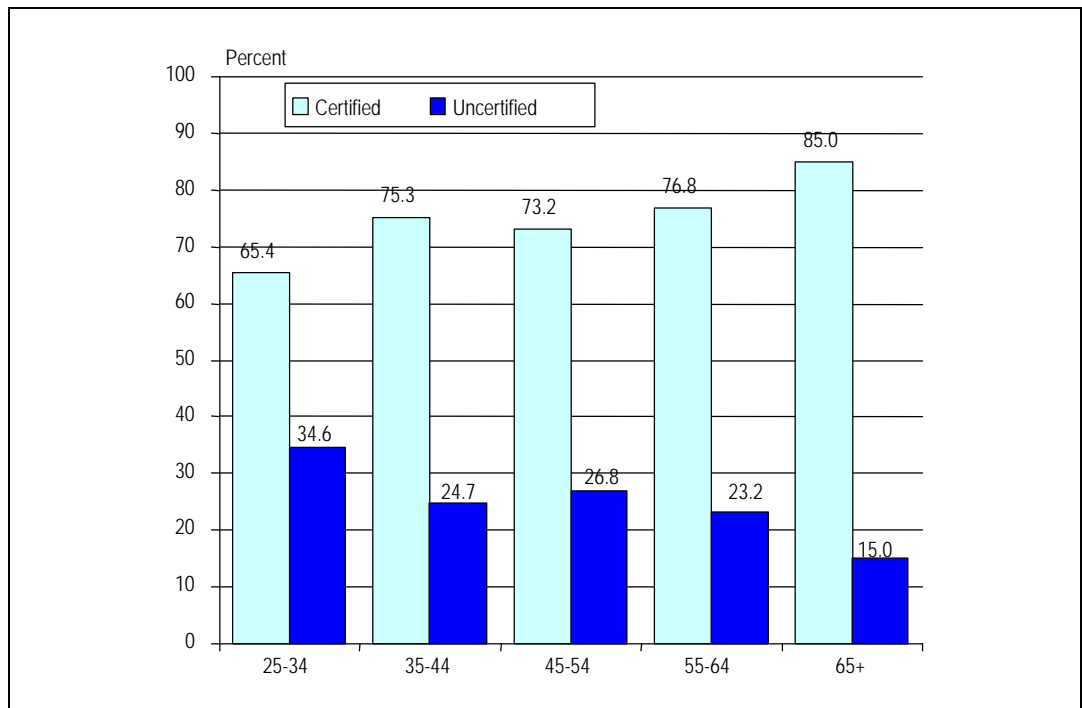
Roughly two-thirds of the sample report having provincial certification in the trade. Of the remaining third, half are active apprentices. These results suggest that certified masons are over-represented in the sample, as data from other sources indicate a larger number of uncertified workers in the trade.

Certification is mandatory in Nova Scotia, New Brunswick, and Québec. Outside of these provinces, certification is voluntary. Although the sample size for individual provinces are too small to permit strong conclusions, results from the workers' survey suggest the following:

- ❑ in provinces where the trade has mandatory certification and it is strongly policed, certification levels are quite high;
- ❑ in provinces where the trade has mandatory certification but it is not strongly policed, certification levels are higher (on average) than in provinces where certification is voluntary; and
- ❑ there appears to be no relationship between voluntary certification and low certification levels in individual provinces.

Figure 4-6 shows the pattern of certification among older workers. The higher share of certification for the older age groups may be explained by a grandfather clause introduced in the 1970s. The timing and methods for applying for certification under the grandfather clause varied across provinces. Typically, tradespeople who could prove they worked in the masonry industry for at least ten years could pay a \$10 fee to get their certificate. The data excludes tradespeople currently enrolled in an apprenticeship program (i.e., not eligible for certification).

Figure 4-6: Bricklayer/Stone Mason Certification by Age Group



*Note: Data excludes respondents currently enrolled in apprenticeship program
Source: ARA Consulting Group, a division of KPMG Consulting LP*

Survey data (excluding Québec) shows that masons and stone masons working in the industrial sector have the highest levels of certification (70%). The industrial sector is followed by the institutional/commercial (where slightly over 67% of these workers are certified), and finally the residential sector (where slightly over 63% of

masons/stone masons are certified). Because the survey sample is skewed towards unionized workers, the certification level for the residential sector is likely overstated (since non-unionized workers tend to work primarily in the residential sector in many areas of Canada).

Survey results show some evidence of a benefit to certification in terms of employability — certified workers outside of Québec report slightly higher weeks worked per year (nearly 38 weeks per year) than their non-certified counterparts, who average slightly over 34 weeks per year.

4.4 Employment Patterns

Working conditions in construction change quickly. The capacity to react quickly to change is a crucial characteristic of the workforce and employers. This section measures the mobility of the workforce across several dimensions. Results are checked to see if mobility is associated with employability (more hours of work) or certification.

Mobility Among Types of Work

The workers' survey identified the following eight work areas and up to 20 specific tasks within each of these:

- a) Build Masonry Foundations and Walls;
- b) Construct Masonry Arches;
- c) Build Masonry Chimneys and Fireplaces;
- d) Install Refractory/Acid-Resistant Materials;
- e) Build Walls, Patios, Piers, Garden Walls, Planters and Other Similar Installations;
- f) Restore Masonry Work;
- g) Work with Pre-Fabricated Masonry Units or Pre-Cast Concrete Units; and
- h) Install Granite/Marble Slabs.

Workers were asked to indicate the frequency at which they performed each broad work area and sub-task. The reported frequency ranged from having no experience whatsoever to performing the task nearly every day. Depth of experience is measured as experience within a single work area and breadth is measured as experience across a variety of different masonry work areas. A masonry worker might have varying degrees of skill depth and breadth. For example:

- A highly specialized worker might perform all of the tasks in a single work area frequently but may have no experience with other work activities. Specialization of this kind might be associated with high productivity or output per hour. The worker however, may be less likely to obtain work in a different area.
- A highly versatile worker, on the other hand, might perform a few tasks from each area on a regular basis. As a result, he/she might be more successful at finding employment in a wide range of masonry areas.

Results from the workers' survey show that over 50% of respondents reported having regular experience in only one work area (i.e., foundations/wall, refractory, restoration, etc.). Twenty-five reported regular experience in two of the main work areas, while 11% of respondents reported having regular experience in three areas. Only 3% of respondents had regular work experience in six or more of the work areas.

Figure 4-7: Share of Respondents Reporting Work Experience by Number of Sectors

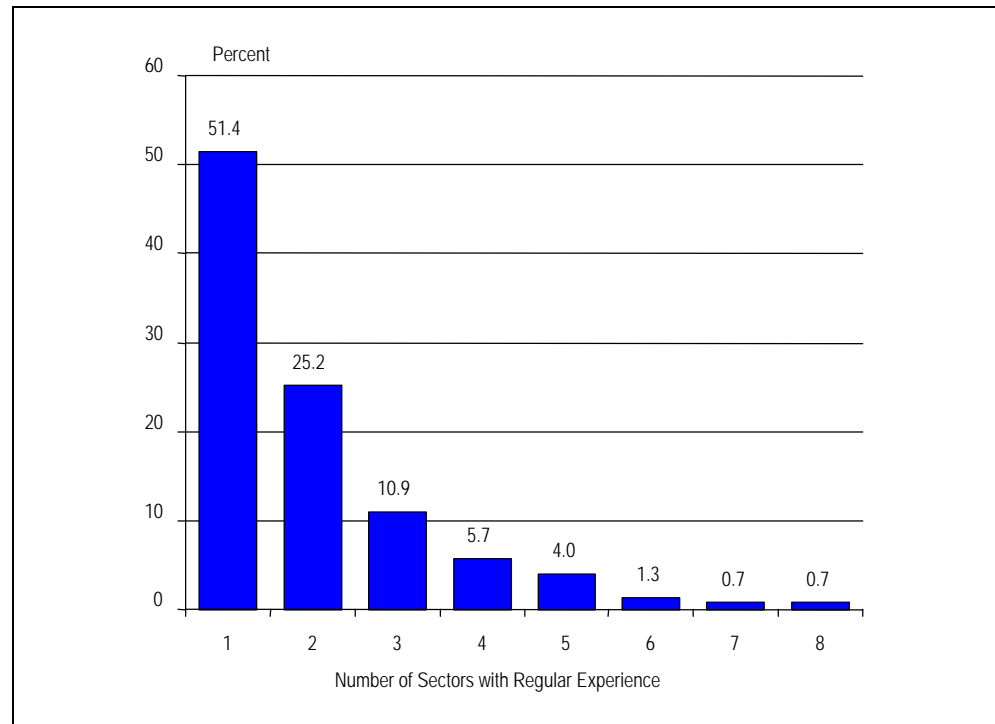


Figure 4-7 reflects an apparent dominance of a few work activities. Further analysis shows foundations and walls as the clear leader. Eighty-nine percent of respondents working regularly in one sector worked in foundations and walls. The next closest sectors were refractory at 7% and restoration at 2% of respondents working in one sector. For respondents working in two sectors, 95% indicated foundations and walls as one of the two sectors.

Among survey respondents, having regular experience at between one and three main activities results in the highest level of weeks of work. Figure 4-8 illustrates the result.

*Figure 4-8: Employability and Mobility
Across Work Types*

# of Different Work Activities	Avg. Weeks Worked	% of Respondents
1	38.6	51.4%
2	36.7	25.2%
3	37.4	10.9%
4	32.4	5.7%
5	34.5	4.0%
6	30.1	1.3%
7	25.7	0.7%
8	11.3	0.7%

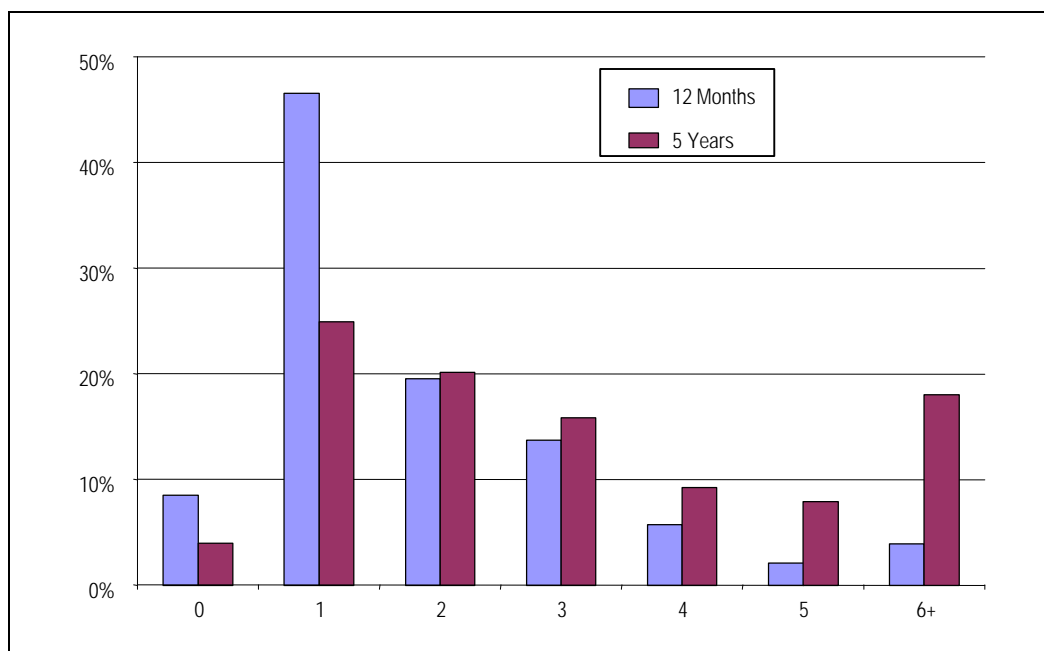
These results are not unexpected given the dominance of foundations and walls as the main work activity. The Steering Committee commented that most of the work in the trade is concentrated in foundations and walls followed by refractory and restoration. Workers would maximize their earning potential among these activities with the other work types, representing a specialization for a few and temporary work for others.

In summary, a small minority of the workforce conducts a wide variety of activities on a regular basis. The highest employability comes with doing only one or two activities regularly. While there is merit in becoming specialized (as opposed to having no specialization), there appears to be little economic value in developing extensive experience beyond this point.

Mobility Among Employers

Just under one-half of the sample report working for just one employer during the past year and another fifth worked for two. This pattern is consistent with other trades and results reported by the CCQ for all trades in that province in 1996. This latter source reports that 70% of all tradespeople work for one employer and 20% for two. Over a period of five years, it is more common for workers to have worked with at least two or three different contractors.

Figure 4-9: Number of Employers in Past 12 Months and Past Five Years



When these results are examined by region, Figure 4-9 emerges:

Figure 4-10: Mobility Among Employers

Province	Average Number of Employers in Past Year	Average Number of Employers in Past Five Years
Atlantic	1.9	3.2
Québec	1.7	2.4
Ontario	2.0	3.4
Prairies	1.5	2.7
BC	2.1	2.9
Total	1.8	3.0

The results from Figure 4-9 and Figure 4-10 suggest that there is a moderate degree of mobility across masonry contractors in both the short-term and long-term. Furthermore, there appears to be regional variations. Mobility across employers is higher for Ontario and British Columbia in the 12-month period, and higher for Ontario and Atlantic Canada in the five-year period.

Mobility Across Provinces

Survey results indicate that in the past 12 months, over 18% of respondents worked in more than one province. This indicates a high level of inter-provincial mobility. Over the past ten years, the proportion of respondents who worked in more than one province increased to nearly 45%. These results suggest that inter-provincial mobility is very important for the masonry/stone masonry trade, in both the short run and the long run.

In the short-term, there are regional differences in inter-provincial mobility for masons and stone masons. As shown in Figure 4-11, the trades are more likely to move among the Atlantic provinces and in the prairies and British Columbia. The larger and distinct labour markets in Québec and Ontario provide more opportunity and workers there are less likely to move. In the longer term, workers in some provinces — parts of Atlantic Canada and the Prairies — have more experience working outside of their home provinces than others.⁷

Figure 4-11: Inter-Provincial Mobility by Province

Province	Total Number of Jurisdictions Worked in Past Year	Total Number of Jurisdictions in Past Ten Years
Newfoundland	1.15	1.59
Nova Scotia	1.00	1.27
New Brunswick	1.87	2.65
P.E.I.	1.59	2.35
Québec	1.20	1.39
Ontario	1.18	1.61
Manitoba	1.20	2.13
Saskatchewan	1.29	2.39
Alberta	1.31	2.03
British Columbia	1.18	1.82
Total	1.28	1.86

In the short run, inter-provincial mobility rates are slightly higher for unionized workers, relative to non-unionized workers (see Figure 4-12). However, in the longer term, this difference disappears.

Figure 4-12: Inter-Provincial Mobility — Union vs. Non-union Workers

# of Jurisdictions Worked In	Worked in Past Year		Worked in Past Ten Years	
	Union (%)	Non-union (%)	Union (%)	Non-union (%)
One	80.3%	90.7%	55.1%	56.6%
More Than One	19.7%	9.3%	44.9%	43.6%

There is a modest link between inter-provincial mobility and provincial certification in the short-term. As Figure 4-13 shows, over 75% of certified workers and over 80% of non-certified workers stay within their home province. However, in the longer term, more than half of all certified workers leave their home province to work, while less than 40% of non-certified workers have out of province experience in the longer term.

⁷ The survey did not measure the extent to which masons and stone masons moved to different regions or cities within their current province of residence, as this activity has little bearing on issues such as national standards.

Figure 4-13: Inter-Provincial Mobility — Certified vs. Non-Certified Workers

# of Jurisdictions Worked In	Worked in Past Year		Worked in Past Ten Years	
	Certified (%)	Non-Certified (%)	Certified (%)	Non-Certified (%)
One	77.2%	83.7%	45.1%	61.9%
More Than One	22.8%	16.3%	54.9%	38.1%

In terms of inter-provincial mobility and the age of workers, it appears that younger masons and stone masons are less mobile in the short-term than their counterparts who are in their prime career years (see Figure 4-14). Differences in mobility are even more pronounced among age categories over a ten-year period. These results, combined with the tendency for apprenticeship to last for an extended period, suggest that inter-provincial mobility of apprentices is limited.

Figure 4-14: Inter-Provincial Mobility by Age Category

	# of Jurisdictions Worked in Past Year		# of Jurisdictions Worked in Past Ten Years	
	One	More Than One	One	More Than One
Under 25	86.2%	13.8%	88.5%	11.5%
25-34	81.8%	18.2%	57.3%	42.7%
35-44	80.5%	19.5%	49.2%	50.8%
45-54	76.8%	23.2%	50.5%	49.5%
55-64	88.3%	11.7%	64.2%	35.8%
65+	84.6%	15.4%	58.8%	41.2%

There appears to be a significant relationship between inter-provincial mobility and apprenticeship status. According to Figure 4-15, less than 15% of apprentices worked outside of their home province during the past year, while over 20% of non-apprentices left their home province in the past year. This difference grows over a ten-year period. In the long-term, less than one-quarter of apprentices work outside of their home provinces, while over 50% of non-apprentices obtain work outside of their home provinces. This may reflect personal preferences of apprentices, but it may also indicate that barriers to inter-provincial mobility for apprentice masons and stone masons exist.

Figure 4-15: Inter-Provincial Mobility and Apprenticeship Status

# of Jurisdictions Worked In	Worked in Past Year		Worked in Past Ten Years	
	Apprentices	Non-Apprentices	Apprentices	Non-Apprentices
One	87.8%	78.6%	77.3%	46.7%
More Than One	12.2%	21.4%	22.7%	53.3%

There appears to be an expected positive relationship between inter-provincial mobility and Red Seal status. Figure 4-16 shows that masons and stone masons who have Red Seal certification are more mobile in the short-term and the long-

term than workers who do not possess Red Seal certificates. A large portion of the sample who lack a Red Seal, however, reported working outside their province of residence. It is interesting to note that the results shown in Figure 4-15 do not substantially change when respondents from Québec are excluded from the analysis.

Figure 4-16: Inter-Provincial Mobility by Red Seal Certification

# of Jurisdictions Worked In	Worked in Past Year		Worked in Past Ten Years	
	Red Seal	No Red Seal	Red Seal	No Red Seal
One	76.4%	84.7%	40.5%	65.3%
More Than One	23.6%	15.3%	59.5%	34.7%

4.5 Conclusions

This section has reviewed several characteristics of the bricklayer workforce in Canada that were reported in the workers' survey conducted for this study. Key conclusions include:

- the sample is slightly older than other trades and that the union members are more senior than non-union workers by a larger margin;
- immigration is an important factor in supplying masonry workers in the past, but is less likely to do so in the future;
- work in the trade is concentrated in three areas: foundations and walls, refractory and restoration; and
- mobility among these areas is rewarded with a modest increase in hours of work.

5. Skills Profile

Key Findings

- Results suggest skill gaps in health and safety and basic skills (math skills, reading blueprints).
- Certified masons report a greater degree of skill breadth (i.e., a higher share of respondents performing a minimum number of tasks across various masonry areas over the past five years).
- The degree of skill depth is adequate across all areas. Masons who work in a particular area typically report using more than half the skills and tasks on a regular basis (a couple times a month or more).
- Certified workers in foundations and walls report a slightly higher skill depth (i.e., the numbers of skills a worker regularly uses within an area) compared to uncertified masons.
- With the exception of foundations and walls, there is no marked difference in skill depth between certified and uncertified masons.

The material presented in this section is based on responses from a national workers' survey. A modified survey was done in Québec; therefore, separate results will be presented to reflect differences in survey content.

The skills profile in this section reflects three distinct sections of the workers' survey: health and safety skills, basic skills (reading and math), and trade-related skills.

5.1 Health and Safety Skills

Workplace health and safety is of critical importance in the masonry and stone masonry trade. A typical bricklayer or stone mason's environment consists of: heavy manual labour, work with dusts and saws, work on scaffolding, work during extreme weather conditions (particularly hot summer weather), as well as bending and lifting. Due to the physical demands of the trade, it is not surprising that this occupational group experiences among the highest incidences of workplace accidents and job-related illnesses for all of construction.

Respondents were asked to identify the major health and safety issues for their trade. Over 70% of the sample (over 550 individuals) responded to this question, many indicating more than one type of health and safety issue. The five most commonly cited health and safety issues, listed in decreasing order of frequency, include:

- *Respiratory Issues Relating to Air Quality* — Over 40% of the survey respondents indicated that this was an important health and safety issue in the trade. Many respondents provided more specific hazards. The two most commonly mentioned air quality hazards were silica from refractory sites and dust from dry cutting saws. Other hazards mentioned included concrete dust, chemical dust, ceramic fibre, smoke, carbon monoxide, and fumes.
- *Back Injuries* — Nearly 25% of the individuals who answered this question were concerned about back injuries and back strain.
- *Improperly Erected or Used Scaffolding* — Nearly 25% of the survey respondents indicated that improperly erected or improperly used scaffolding (also encompassing swing stages, planks, and platforms) was a serious problem on the job site.
- *Falls from Heights* — Over 15% of respondents believe that falls from heights was an important issue. Although most falls from heights occur from scaffolding, this response is different from the previous category, which focused on the quality and use of scaffolding structures themselves.

- *Issues Relating to Employer Practices and Attitudes* — Just under 15% of the respondents expressed frustration that their personal health and safety was at risk because of employer practices and attitudes. Some individuals felt that employers provided unsafe equipment and work environment (such as poor lighting and lack of Personal Protection Equipment (PPE)), while others indicated that employers pressured them into cutting corners and rushing their jobs. A number of respondents also noted that the employers relaxed their health and safety attitudes once inspectors left the site.

In addition to the health and safety issues listed above, respondents indicated other issues (in decreasing frequency):

- poor worker knowledge;
- attitudes and practices;
- injuries caused by heavy lifting;
- injuries caused by loud noise from tools and equipment;
- eye injuries;
- an overall need for more training and awareness in health and safety issues;
- need for increased use of personal protective equipment (PPE);
- repetitive strain injuries; and
- injuries caused by hazardous products on the job site.

The frequency and breadth of issues cited by respondents implies a number of things. First, they are areas where workers have some concern that their health may be at risk. Second, they are areas where workers wish to have the knowledge and training to reduce injury and accidents. Third, there are areas where proper procedures need to be followed and a safe environment provided by contractors. Finally, these issues represent areas where improvements in technology (such as scaffolding, protective equipment, masonry materials, or ventilation) and work procedures may be required in order to make the trade safer for masons and stone masons.

Health and Safety Training

The results in Figure 5-1 show that there is a higher incidence of training taken by certified masons compared to uncertified. However, the results show that level of training taken may be below an acceptable level for a trade consisting of heavy manual labour and heights. The workers' survey reports that slightly less than half of certified and only 31.5% of uncertified masons have taken basic health and safety training for construction.

Figure 5-1: Training Received by Masons and Stone Masons (Excluding Québec)

Type of Training	% of Respondents Who Have Taken This Training and/or Received a Certificate Upon Completion of Training	
	Certified	Uncertified
WHMIS	77.3	61.2
First Aid	49.7	33.8
Basic Health & Safety Training for Construction	47.6	31.5
CPR	38.5	26.0
Working with Scaffolding	36.0	29.7
Working with Heights	30.9	19.6
Avoiding Back Injuries	26.5	19.2
Masonry-Specific H&S	20.6	11.0
Certified H&S to be a H&S Representative	11.6	6.8
Pulmonary Test	11.6	2.7

Source: 1998 Workers' Survey

The results for WHMIS show that 77% of certified masons and stone masons have taken WHMIS training. WHMIS training is mandatory under provincial Occupational Health and Safety legislation in many jurisdictions. On the other hand, only 50% of certified and 34% of uncertified respondents indicated the completion of basic health and safety training for construction. The results were significantly lower for masonry specific health and safety training.

The incidence of training for scaffold safety, working with heights, and avoiding back injuries were also quite low, considering that these issues are of high concern to masonry workers.

At the regional level, the share of respondents reporting safety training varies significant across the different types of training. Figures 5-2 and 5-3 report the regional share of respondents (certified plus uncertified) who have taken training. No one region stands out as superior across all types of training.

Figure 5-2: Training Experience by Province

Region	% of Respondents Who Have Taken Training (Selected Types of Training)				
	WHMIS	Basic H&S	Masonry H&S	First Aid	CPR
Atlantic	73.2	30.9	11.3	54.6	43.3
Québec	52.9	73.5	N/A	29.4	N/A
Ontario	85.1	50.9	25.0	34.2	25.9
Prairies	82.3	53.0	18.1	62.3	47.9
British Columbia	60.0	30.0	12.0	56.0	44.0

N/A — Not Available

Source: 1998 Workers' Survey

Figure 5-3: Training Experience by Province

Region	% of Respondents Who Have Taken Training (Selected Types of Training)			
	Back Injuries	Heights	Scaffolding	Pulmonary Test
Atlantic	21.6	30.9	33.0	9.3
Québec	N/A	N/A	N/A	N/A
Ontario	29.4	30.3	40.8	4.8
Prairies	27.4	27.4	34.4	15.8
British Columbia	24.0	40.0	46.0	2.0

N/A — Not Available
Source: 1998 Workers' Survey

When examining the data by work area (foundations and walls, refractory, restoration, etc.), refractory clearly reports more advanced health and safety training requirements. In many cases, specialized training is required for confined spaces and special certification may be required to work on certain refractory projects.

Overall, the results indicate more health and safety training is required in specific areas. Although WHMIS training is important, it is arguable that health and safety training is more critical, since it addresses musculo-skeletal disorders (MSDs) and accident prevention which are higher priorities for masons and mason tenders.

The Construction Safety Association of Ontario (CSAO), Ontario Masonry Contractors Association (OMCA) and Ontario Workplace Safety and Insurance Board (WSIB) entered into a partnership to analyze trade activities with a high risk of causing MSDs.⁸ The results of the research recommends that corrective and preventative measures must be taken to reduce risk factors that contribute to musculo-skeletal disorders. Masonry MSD injuries primarily involve the lower back. Masonry workers bend forward over 1,000 times per shift. In addition, working in confined spaces imposes awkward postures contributing to MSDs.

Through these research initiatives and the implementation of safety training programs, the industry can work together to protect its workforce.

5.2 Basic Skills

The workers' survey undertaken for this study asked respondents about their use of reading and math skills. The survey tracked the following on-the-job basic skills:

- ❑ read blueprints or specifications;
- ❑ measure and estimate volume;
- ❑ measure and estimate area;
- ❑ measure and estimate weight;
- ❑ measure and estimate angles;
- ❑ calculate ratios or percentages;
- ❑ convert from imperial to metric (e.g., sq. ft. to sq. m.); and
- ❑ use a calculator.

⁸ "Musculoskeletal Injuries in the Masonry Trade", Construction Safety Magazine (Volume 10, Number 3, Autumn 1999).

While frequency of use and competence are not precise equivalents, they are closely related. Frequency implies competence. Infrequent use, however, may indicate either skill weakness or a lack of need to apply the skill. Since skill erodes without use, infrequent use is more likely to indicate skill weakness. Figure 5-4 illustrates the percentage of respondents who report using specific basic skills moderately (few times a month) or frequently (every day or nearly every day).

Figure 5-4: Percentage of Respondents Reporting Moderate or Frequent Use of Basic Skills

	All	Owner/Oper.	Foreperson	Journeyman	Apprentice	Helper
Blueprints	44.2	75.0	85.3	59.6	25.3	40.7
Volume	42.0	70.9	67.7	39.1	27.0	31.8
Area	51.6	82.2	65.7	48.5	39.2	52.1
Weight	25.1	51.0	41.7	20.6	16.3	30.0
Angles	35.5	57.4	55.4	33.7	21.0	52.4
Ratios	24.8	57.4	40.8	21.9	17.3	35.0
Convert	42.1	63.7	56.8	37.8	43.0	47.6
Calculator	33.4	61.9	52.2	29.4	23.1	25.0

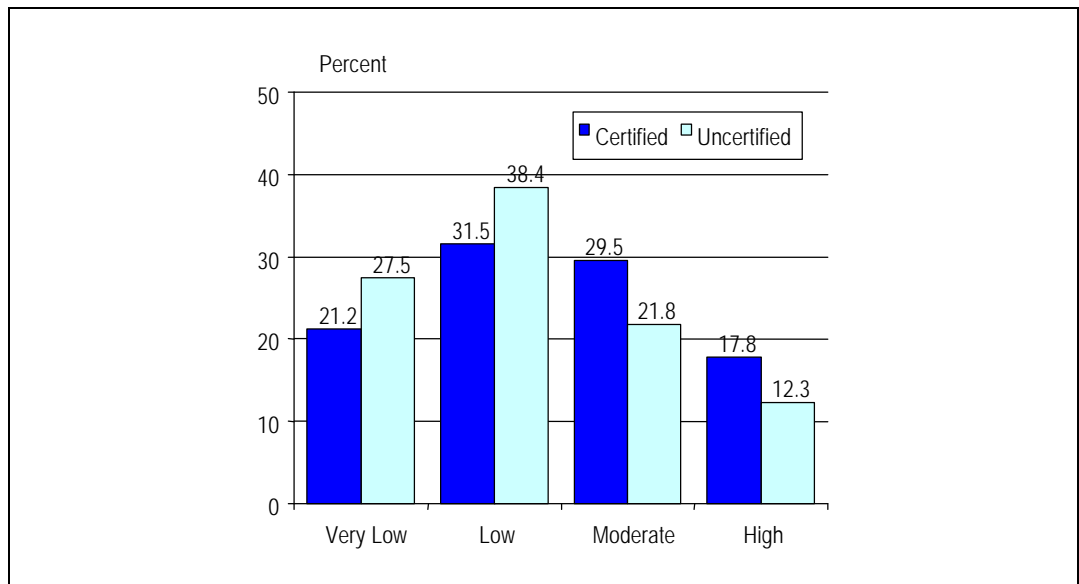
Source: 1998 Workers' Survey (excluding Québec)

Owner/operators and forepersons reported a higher frequency of use compared to journeymen, apprentices and helpers. Apprentices were noticeably weak across all basic skills.

Math Skills

A composite indicator was developed to provide a general measure of the use of math skills. Figure 5-5 shows the distribution of use.

Figure 5-5: Masons Frequency of Use of Math Skills — Composite Index



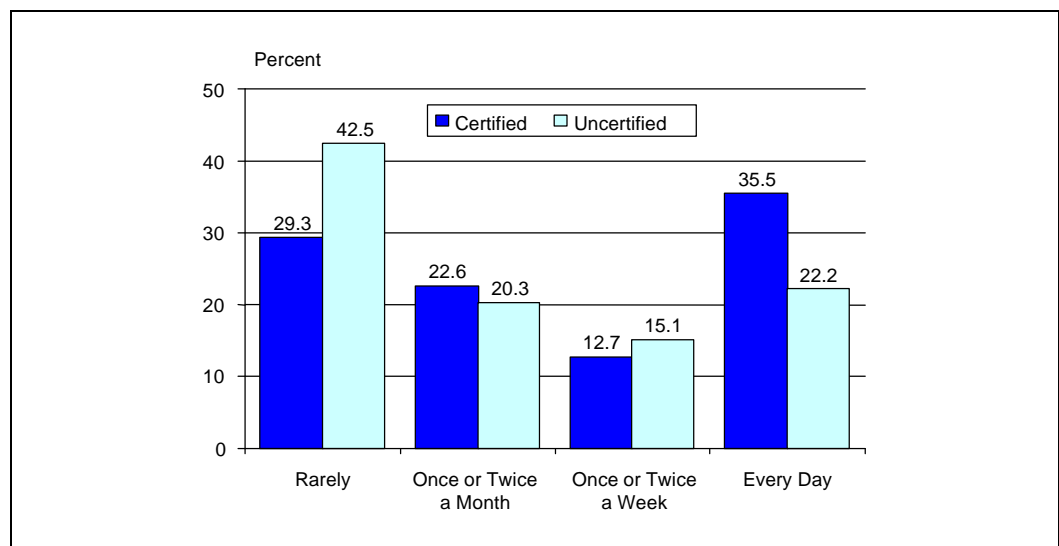
Source: 1998 Workers' Survey (excluding Québec)

The composite indicator shows a significant difference between certified and uncertified masons. The data shows 17.8% of certified workers report a high frequency of use of basic skills compared to 12.3% for uncertified workers. Among uncertified masons, 65.9% rarely (very low/low) apply math skills. This compares to 52.7% for certified masons. These results reflect a basic skill weakness.

Blueprint Reading

The workers' survey results indicate that only 35% of certified and 22% of uncertified masons read blueprints or specifications every day (see Figure 5-6). In fact, 29% certified and 42% of uncertified masons rarely or never read blueprints. The incidence of rare use indicates an eventual deterioration of ability to apply this skill if required. Upgrade or refresher courses may be required.

Figure 5-6: Masons Frequency of Use of Blueprint Reading



Source: 1998 Workers' Survey (excluding Québec)

While the average use of blueprint and specification reading skills are low, the frequency of use across difference types of workers varies significantly. Among forepersons, 85.3% indicated they read blueprints or specifications one or twice a week or every day. On the other hand, only 25.3% of apprentices frequently apply the skill. As apprentices progress through the trade, upgrade training will be required.

5.3 Trade Skills and Experience

The workers' survey identified eight work areas with three to 28 work tasks within each:

- ❑ build masonry and foundation walls;
- ❑ construct masonry arches;
- ❑ build masonry chimneys and fireplaces;
- ❑ build smokestacks, install refractory/acid-resistant materials;
- ❑ build walks, patios, piers, garden walls, planters and other similar installations;

- restore masonry work;
- work with pre-fabricated masonry units or pre-cast concrete units; and
- install granite/marble slabs.

This section reports on the frequency of work and apparent skill depth in each area.

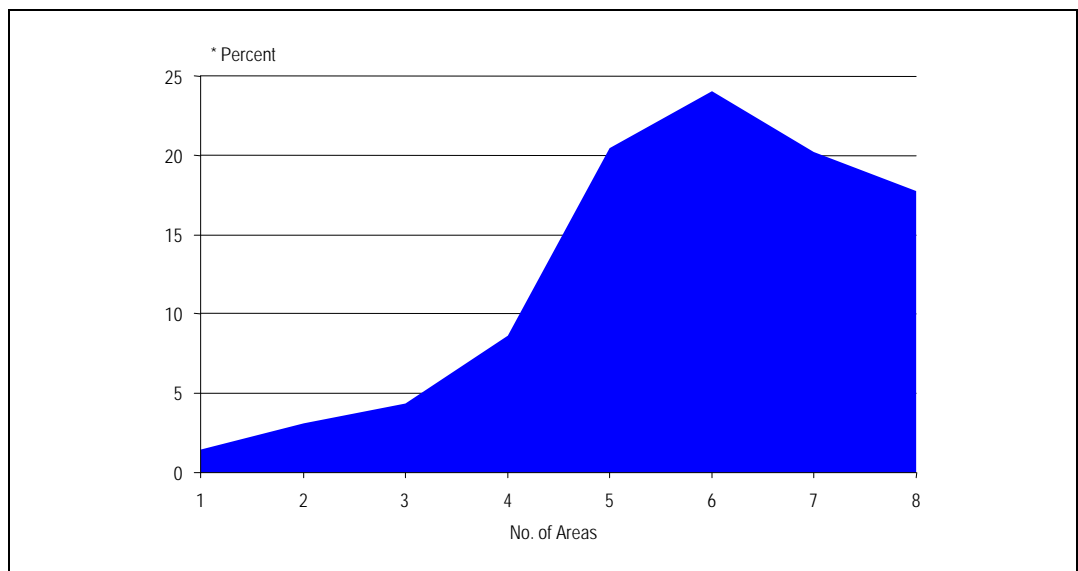
Skill and Breadth and Depth

Skills can be placed on a spectrum that reflects the degree to which they are applicable across a range of work situations. At one end of the spectrum are highly portable skills which are relevant to a number of different areas of masonry work. At the other end of the spectrum are skills which are applicable only to a particular type of work. Skill breadth is associated with employability in different work areas of the trade. Skill depth refers to proficiency within a particular area. Results reported associate work experience with proficiency at needed skills. Thus, if a worker reports frequent work in one task it is assumed that he is proficient with the needed skills.

Both skill breadth and depth contribute to employability. Skill depth is a natural consequence of regular employment with a specialized contractor. In general, the extent of specialization will reflect the size of the market. In larger markets contractors will typically service a number of sectors.

Figures 5-7 and 5-8 demonstrate the pattern of skill breadth for certified and uncertified masons. When comparing the two graphs, it is apparent that certified masons have a noticeable greater degree of skill breadth (i.e., a higher share of respondents performing a minimum number of tasks in a sector over the past five years).

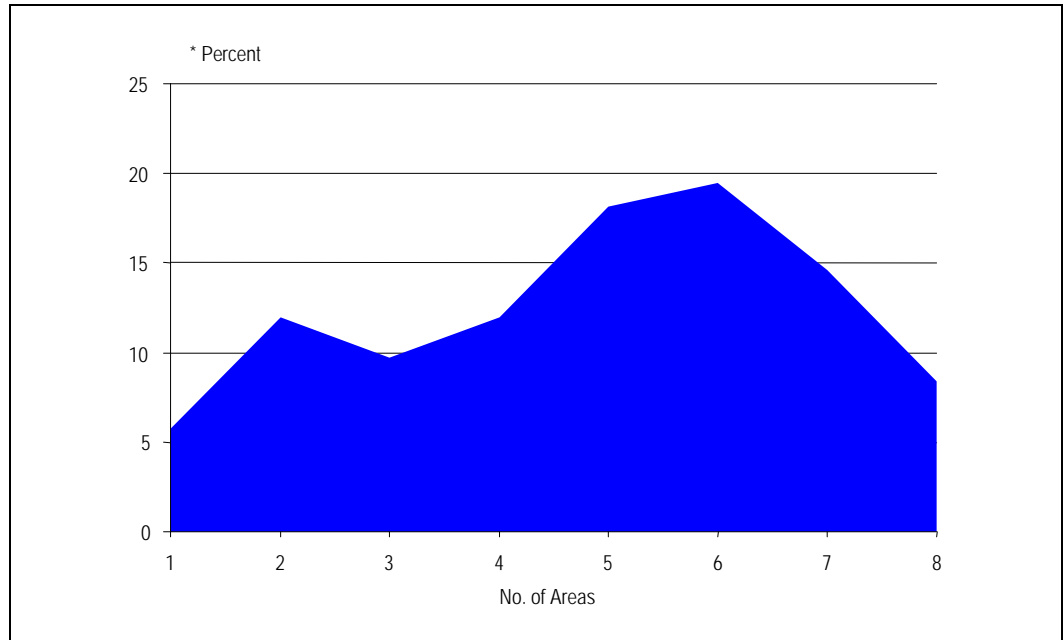
Figure 5-7: Pattern of Skill Breadth (Certified Masons)



* The number of areas in which respondents have performed a minimum number of tasks in a sector in the past five years

Source: 1998 Workers' Survey

Figure 5-8: Pattern of Skill Breadth (Uncertified Masons)



* The number of areas in which respondents have performed a minimum number of tasks in a sector in the past five years
Source: 1998 Workers' Survey

The greater skill breadth of certified masons may be the result a greater likelihood that they are union members. Union members tend to be exposed to greater employment opportunities across sectors through the union's dispatch system. There is also a tendency of unionized contractors to be larger than their non-union counterparts.

In examining skill depth in each work area, we employ two concepts: the degree of skill depth and the task or skill coverage.

The degree of skill depth measures the number of skills in a sector that individuals, who work in that work area, report using within the last five years.

Task or skill coverage identifies the proportion of respondents who work in an area and who carry out a particular task or use a particular skill on a monthly or more frequent basis. A low task or skill coverage indicates a possible shortage.

The balance of this section profiles the skill depth of masons for each of the eight major work areas. The profile examines: the proportion of the trade who work in an area; the overall level of proficiency within a skill-set or area; and specific skills which are at risk of on-the-job error. It should be noted that some of the tasks in each major work area involve similar techniques, but the use of different materials. However, in many of these instances, there are unique characteristics of the materials that suggest that these tasks be treated differently for survey purposes.

Readers can refer to Appendix B for a copy of the workers' survey used for this analysis.

Build Masonry Foundations and Walls

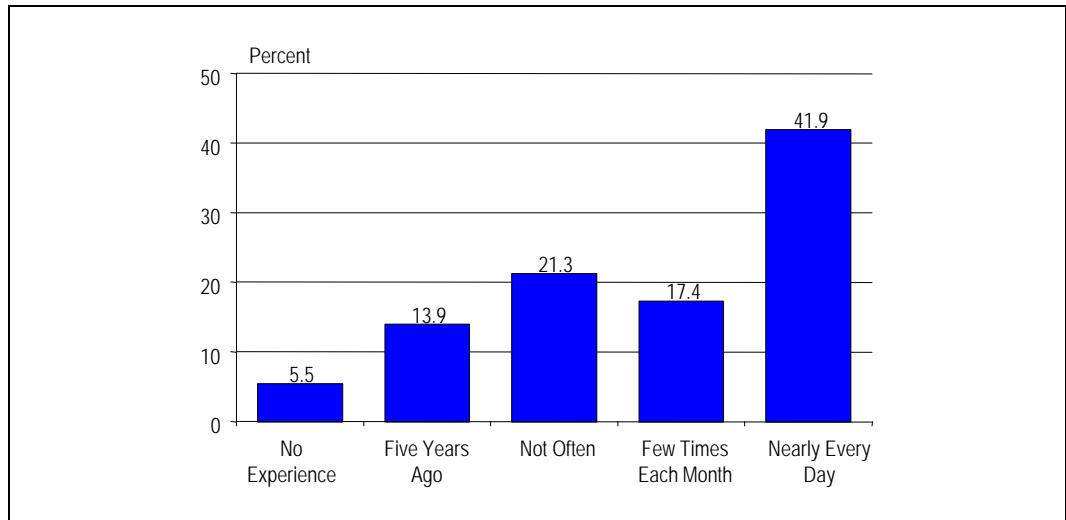
The construction of masonry foundations and walls was identified as one of the key work areas for the masonry industry. In the previous section it was reported that the foundation and walls sector accounts for over 75% of masonry construction activity. As a result, it was not unexpected that most respondents would indicate regular experience in this sector.

The following tasks were tracked for this survey:

- select and prepare mortar;
- lay mortarless block;
- measure and cut materials to size;
- waterproof masonry;
- install mesh, rebar, etc.;
- clean masonry;
- build in sills, lintels, frames;
- establish base or building line from street line; locate front corner points;
- install control/expansion joints;
- erect scaffolding;
- install flashing;
- lay concrete block;
- apply parging;
- lay brick;
- shape natural stone;
- make wooden storey poles with gauge marks;
- build corbels, offsets, etc.;
- lay glass block;
- install temporary bracing;
- lay natural stone;
- install vapour or air barrier;
- lay artificial stone;
- install insulation;
- install wall lock;
- install weep holes;
- install masonry ties;
- lay mortarless brick; and
- install block fill grout.

Figure 5-9 shows the approximate distribution of experience of constructing foundations and walls. Over half (59.3%) of all respondent report working in this sector at least a few times a month or more. The labour pool could be extended to include workers that do the work but not very often. As a result, the potential labour pool could be as high as 80.6%.

*Figure 5-9: Build Masonry Foundations and Walls
(Estimated Distribution of Work Experience)*

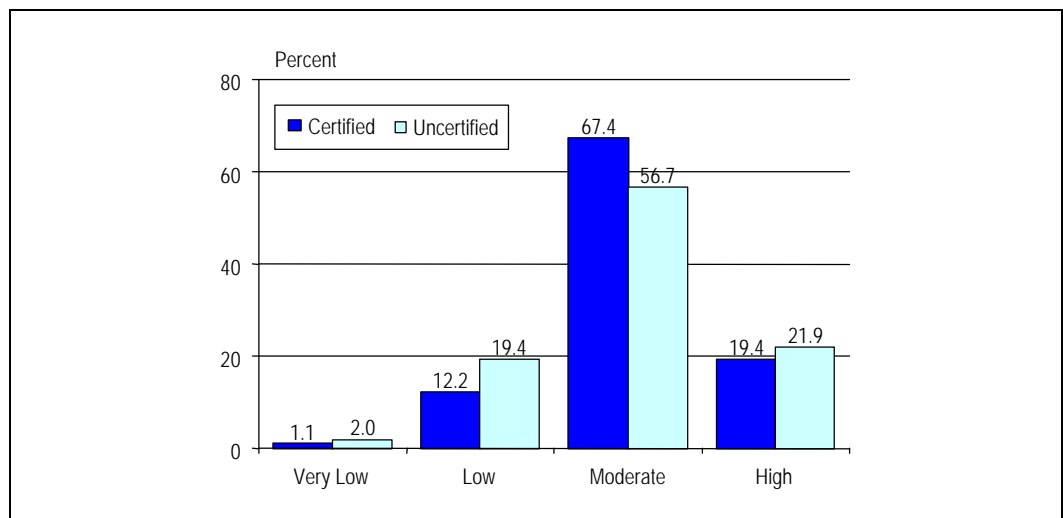


Source: 1998 Workers' Survey (excluding Québec)

Figure 5-10 shows the distribution of skill depth among those that work on a monthly or daily basis in the foundations and walls area. A high skill depth indicates that workers apply most of the tasks for the area on a regular basis. The results for foundation and wall workers reflect a relatively high rotation of skills which implies the need for skill depth (i.e., proficiency) and flexibility across several tasks to ensure employability.

Certified workers show marginal more skill depth than uncertified masons. Survey results indicate that 86.8% of certified respondents reported moderate to high skill depth (i.e., routinely carry out more than half the tasks for this sector). This compares to 78.6% for uncertified respondents.

Figure 5-10: Build Masonry Foundations and Walls — Distribution of Skill Depth



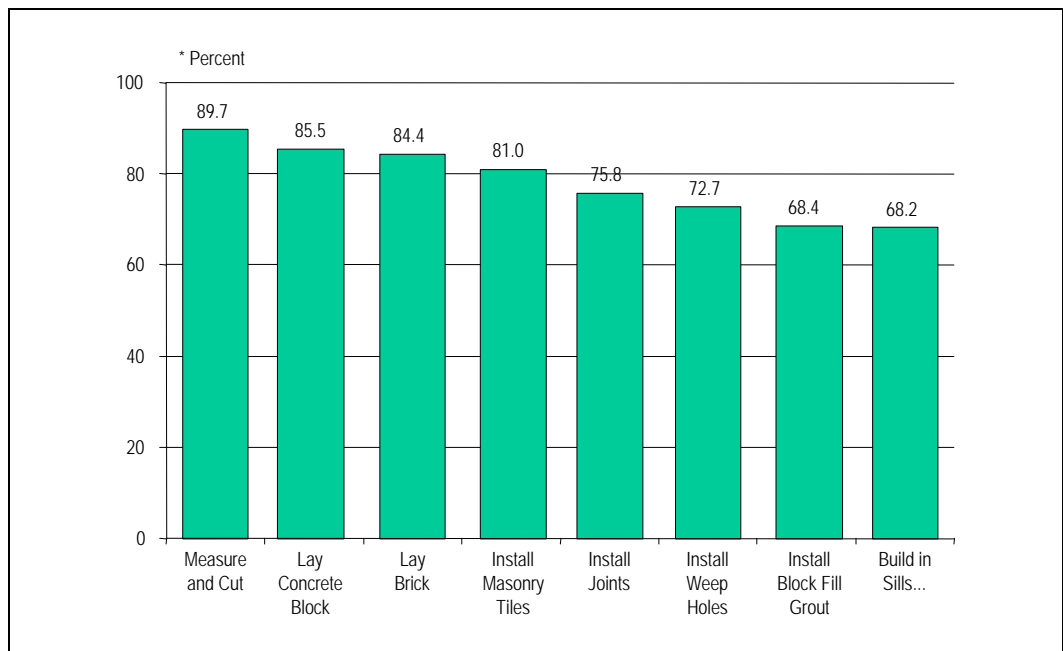
Source: 1998 Workers' Survey (excluding Québec)

Figures 5-11 through 5-13 show the share of respondents who work in the foundations and walls and report doing a particular task regularly (i.e., at least monthly). The results show the core skills for masonry trades include:

- ❑ measuring and cutting;
- ❑ laying concrete block;
- ❑ laying brick; and
- ❑ installing masonry ties.

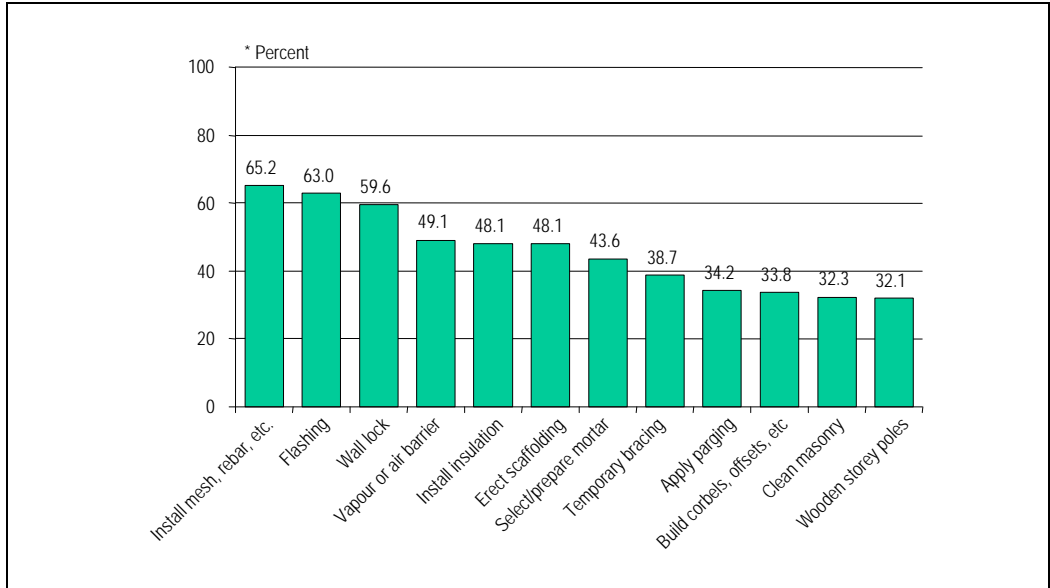
Over 80% of respondents indicated that they used these tasks at least a couple of times a month. At the other end of the spectrum, less than 15% of respondents indicated they lay mortarless brick or block on a regular basis. The lower experience for mortarless masonry may reflect the limited application of these products relative to traditional bricks and blocks.

Figure 5-11: Build Masonry Foundations and Walls — High Skill Usage



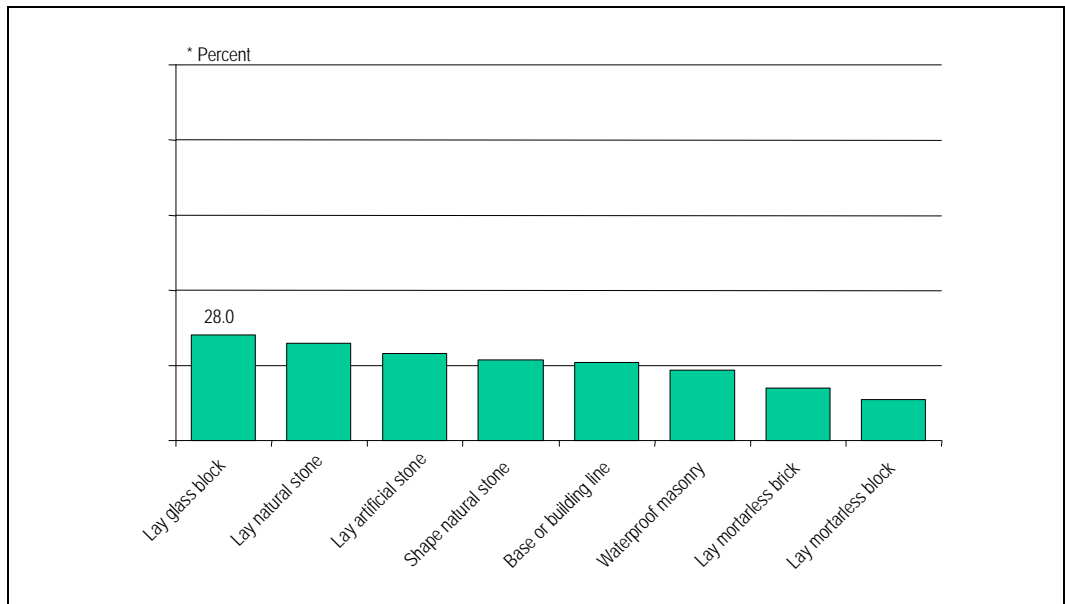
* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Figure 5-12: Build Masonry Foundations and Walls — Moderate Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

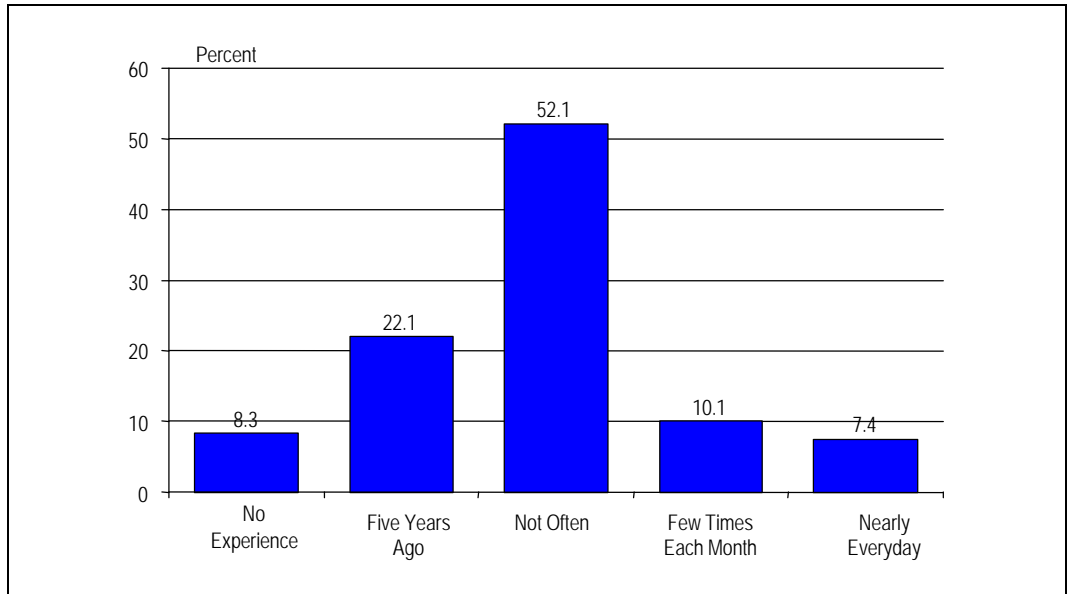
Figure 5-13: Build Masonry Foundations and Walls — Low Skill Usage



-14, 17.5% of survey respondents indicated they do arch
ve worked in
the sector but not very often could be called upon should demand warrant it.

ability to perform these skills if required.

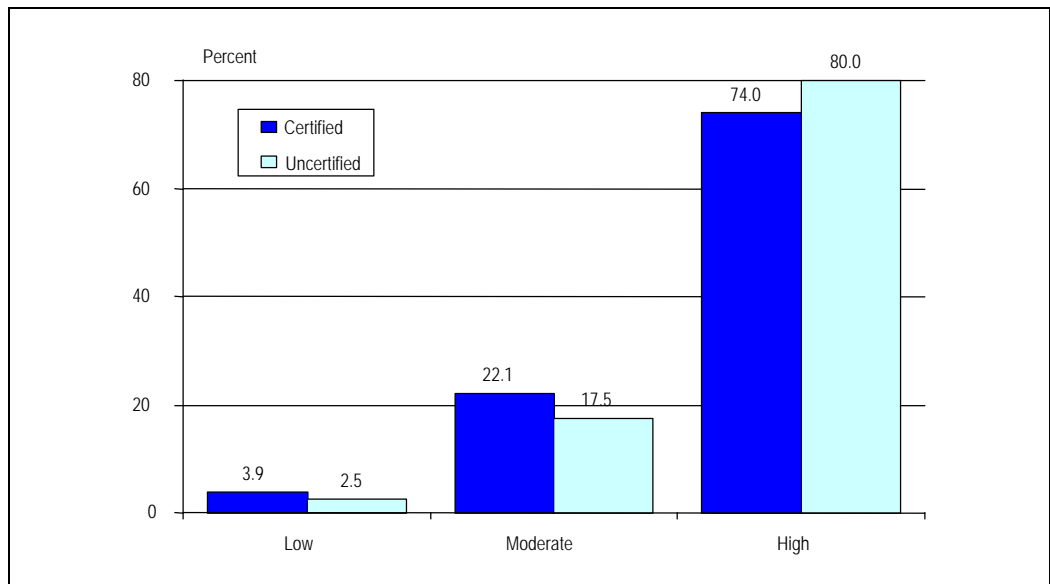
-14: Construct Masonry Arches (Es



Source: 1998 Workers' Survey (excluding Québec)

The results for the distribution of skill depth presented in Figure 5-15 show that over 95% of arch workers apply two or three tasks on a regular basis. The construction of arches essentially requires the application of all skills. Certified and uncertified masons show similar skill depth in this work area.

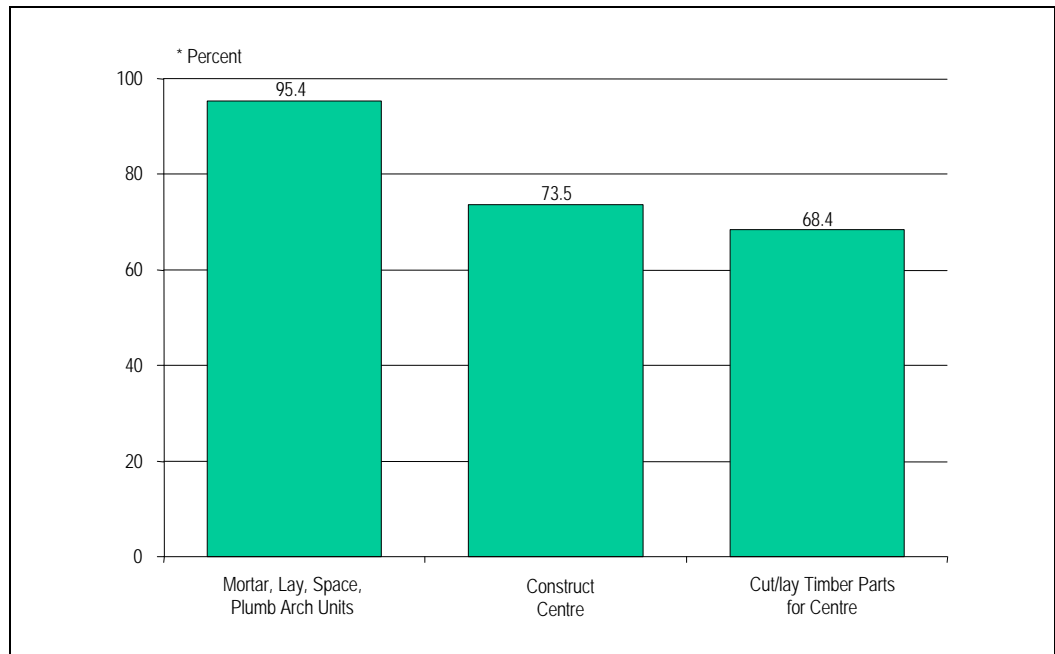
Figure 5-15: Construct Masonry Arches — Distribution of Skill Depth



Source: 1998 Workers' Survey (excluding Québec)

Figure 5-16 shows the proportion of masons who work regularly with arches and report doing a particular task at least monthly.

Figure 5-16: Construct Masonry Arches Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
Source: 1998 Workers' Survey (excluding Québec)

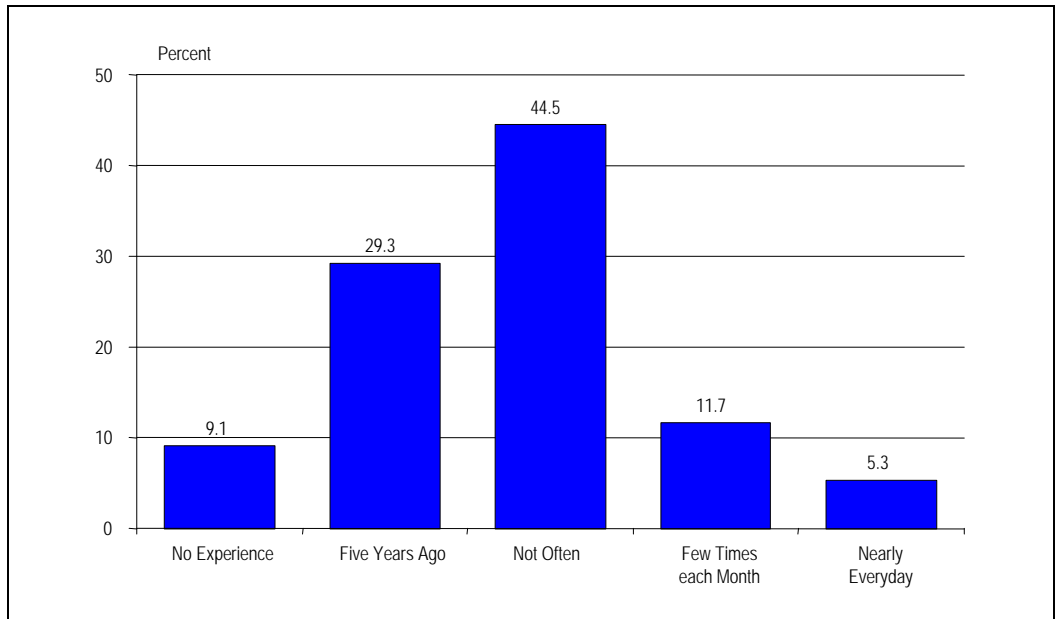
Build Chimneys and Fireplaces

A total of 12 tasks were tracked for chimneys and fireplaces, including:

- Chimneys:
 - install flue liners;
 - lay firebrick liners;
 - build in chimney accessories;
 - install flashing; and
 - install cap.
- Fireplaces:
 - excavate footer trench, set grade stakes, place concrete;
 - lay firebrick;
 - install damper;
 - install lintel;
 - build mantel;
 - install pre-fabricated fireplace; and
 - face fireplace.

Figure 5-17 shows that 17% of masons work regularly in the chimney and fireplace sector, primarily in the residential sector. When extended to include workers that have done some work in the base five years, the labour pool could be expanded as high as 61.5%.

*Figure 5-17: Build Chimney and Fireplaces
(Estimated Distribution of Work Experience)*

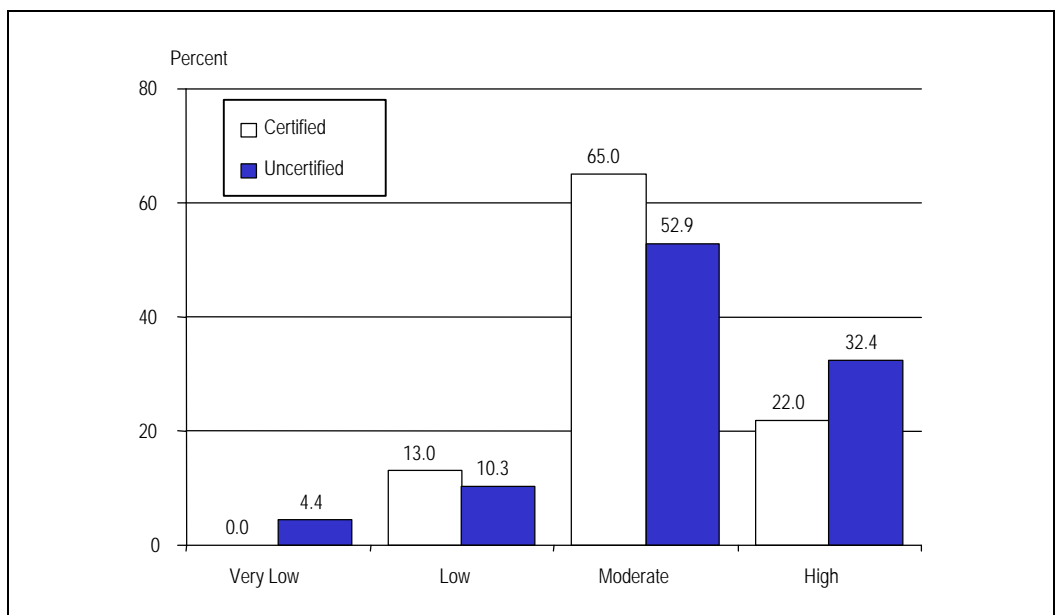


Source: 1998 Workers' Survey (excluding Québec)

It is apparent from Figure 5-18 that approximately 85% of masons working in the chimney and fireplace sector utilize most tasks on a regular basis. The high level of experience across tasks is expected, since the skills covered by the survey represent the tasks typically required to complete fireplace or chimney projects.

There is no significant difference between the skill depth for certified and uncertified masons.

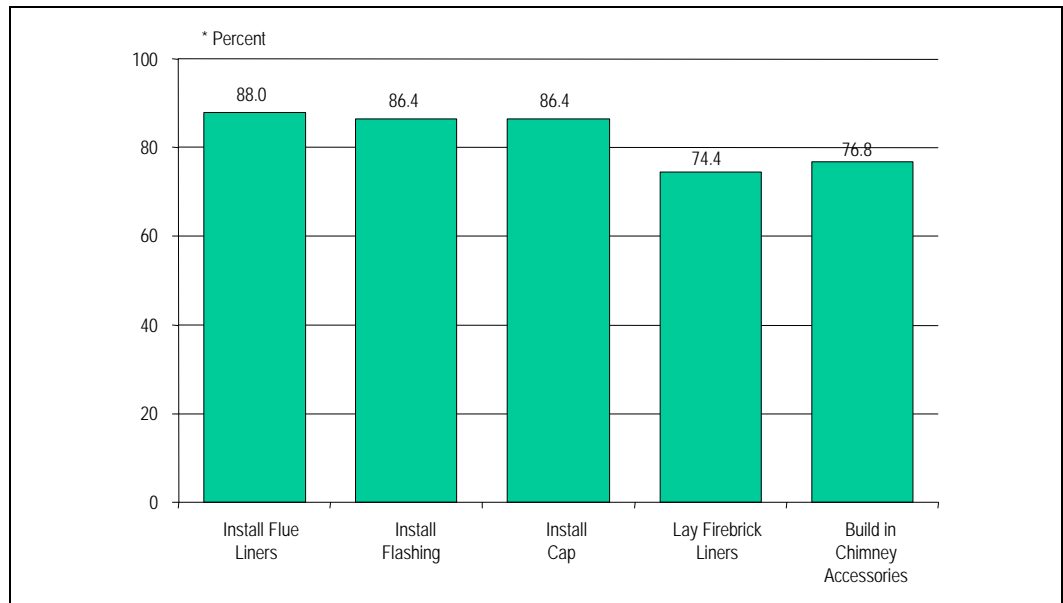
Figure 5-18: Build Chimneys and Fireplaces — Distribution of Skill Depth



Source: 1998 Workers' Survey (excluding Québec)

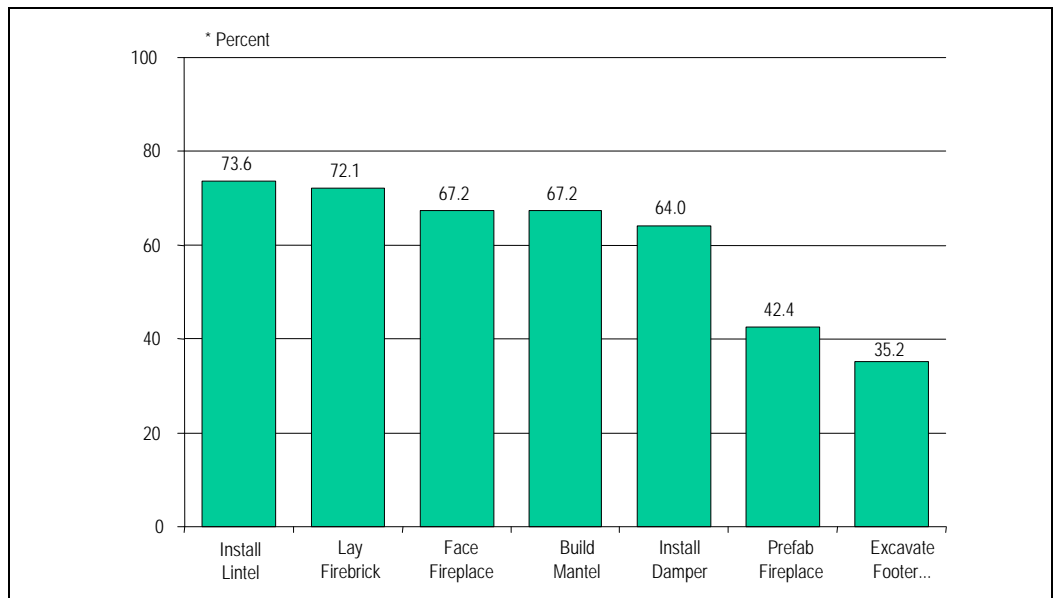
Figures 5-19 and 5-20 show the proportion of masons who construct chimneys and fireplaces and who regularly carry out each of the tasks covered by the survey.

Figure 5-19: Build Chimneys and Fireplaces — High Skill Usage



* Percentage of respondents doing a particular, task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Figure 5-20: Build Chimneys and Fireplaces — Moderate Skill Usage



* Percentage of respondents doing a particular, task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

The results for Québec show a much higher installation of pre-fabricated fireplaces. Seventy-one percent of Québec respondents indicated they regularly use that skill compared to 42% of the rest of Canada. As a result, Québec percentages of doing cap installation, building mantels and fireplace faces were much lower than the rest of Canada respondents.

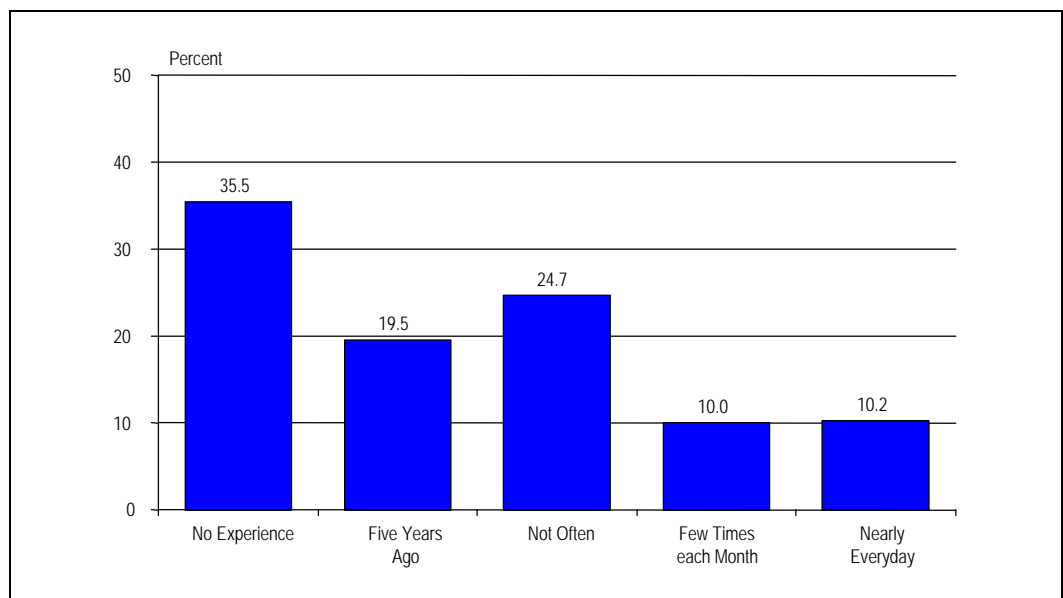
Build Smokestacks, Install Refractory/Acid-Resistant Materials

Refractory construction is estimated to be the second largest masonry work area. In the workers' survey, a total of 13 tasks were tracked, including:

- Industrial Chimneys:
 - lay radial bricks to build shells; and
 - build in/make provision for step irons, lightening rods, aviation warning lights, and cat walks.
- Refractory/Acid-Resistant Materials:
 - remove existing brickwork/lining;
 - lay brick lining;
 - prepare and apply castable mixture;
 - use pneumatic rammer to ram plastic slabs into a single mass;
 - install acid-resistant/acid-proof membrane;
 - install acid brick/tile lining;
 - install ceramic fibre lining;
 - install acid-resistance membrane;
 - prepare and apply gunite;
 - prepare and apply shotcrete; and
 - weld anchors.

Figure 5-21 shows that 20.2% of survey respondents report doing this regularly. The degree of specialization of refractory work means that it is unlikely that the labour pool could be extended to include workers that have worked in the sector but not very often. As a result, increased demand beyond those that work regularly (few times a month or greater) in the sector would require training in order to effectively service this sector.

Figure 5-21: Build Smokestacks, Install Refractory/Acid-Resistant Materials — Estimated Distribution of Work Experience

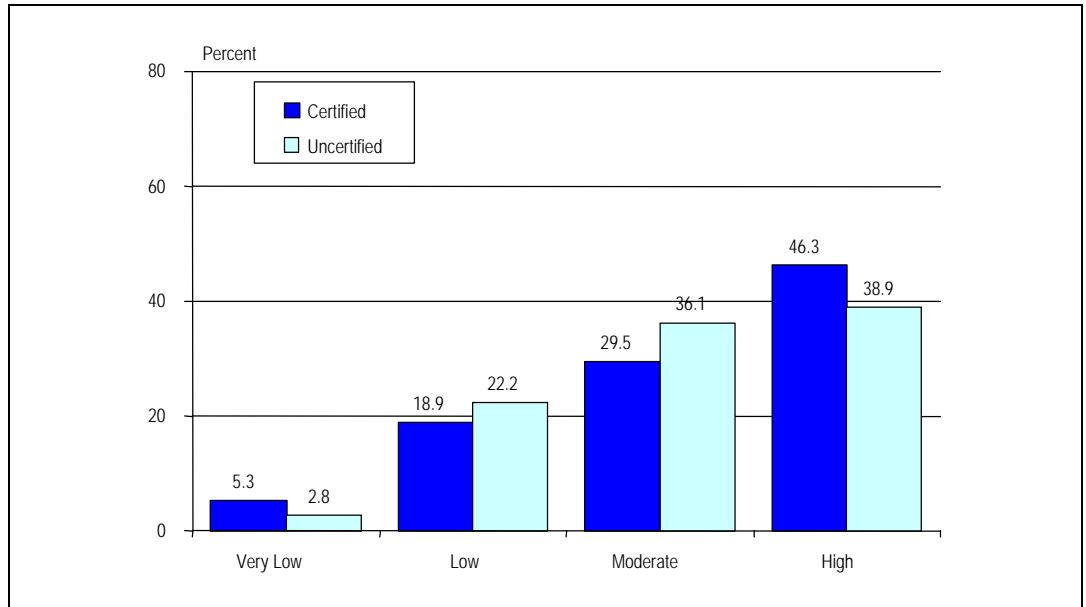


Source: 1998 Workers' Survey (excluding Québec)

Figure 5-22 shows that workers in the refractory sector regularly use most of the tasks covered for this work area. The high skill depth is typically associated with employment with specialized contractors, as is the case for refractory work.

There was no significant difference between experience levels for certified compared to uncertified masons. This may be the result of the sector being dominated by a small number of specialized contractors. These contractors often train workers for areas of specialty and rely heavily while maintaining access to these workers. The focus may be less on certification as it is on the skill depth or proficiency of workers.

Figure 5-22: Build Smokestacks, Install Refractory/Acid-Resistant Materials — Distribution of Skill Depth



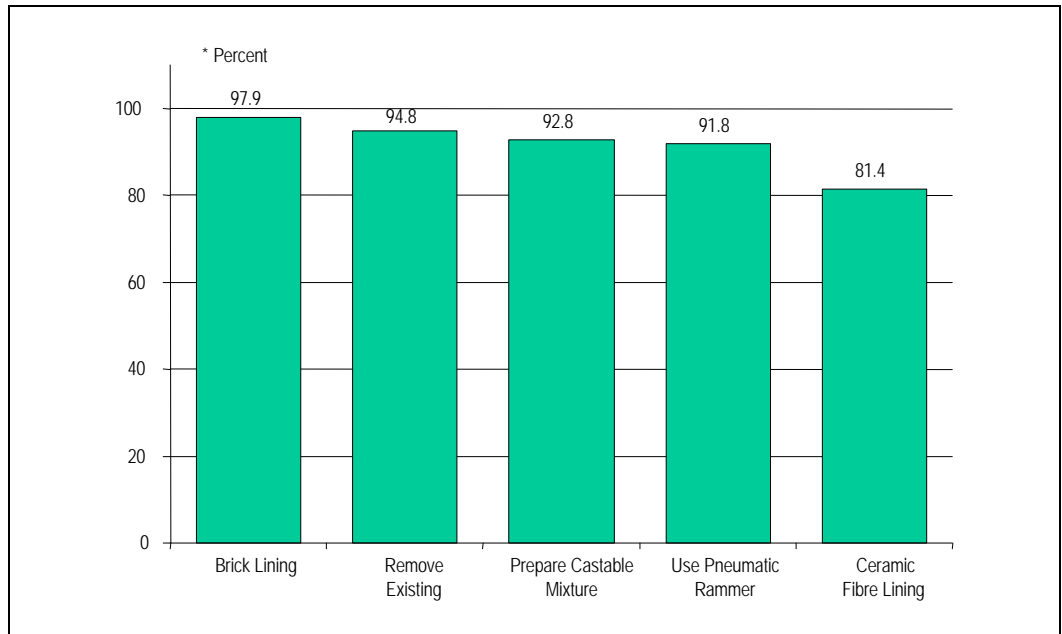
Source: 1998 Workers' Survey (excluding Québec)

Figures 5-23 and 5-24 show the proportion of survey respondents that work in the refractory area and regularly undertake the tasks covered by the survey.

Figure 5-

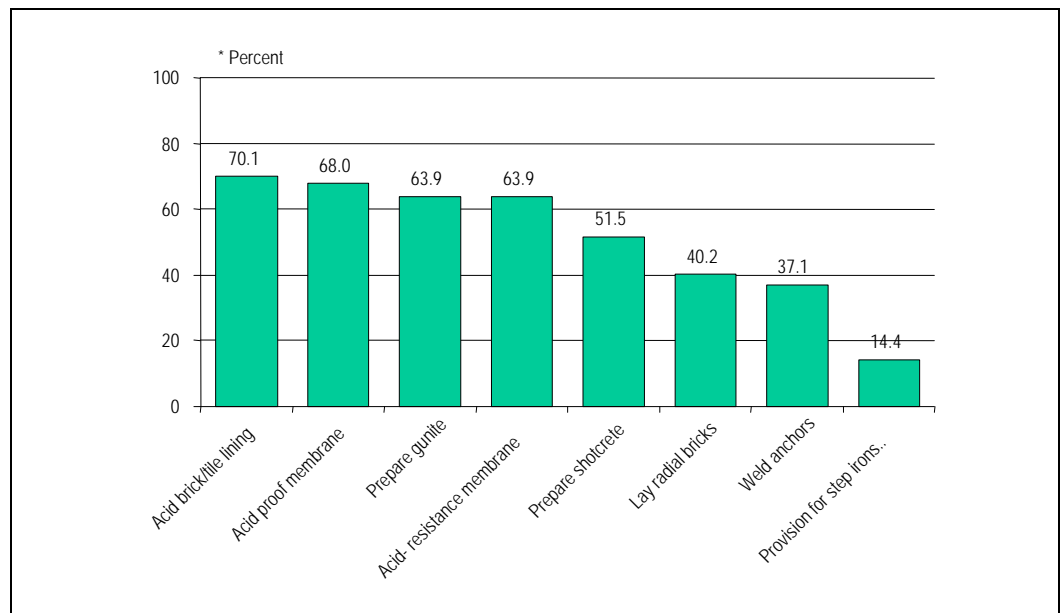
-Resistant

Materials —



* Percentage of respondents doing a particular task or using a particular skill at least monthly
Source: 1998 Workers' Survey (excluding Québec)

Figure 5-24: Build Smokestacks, Install Refractory/Acid-Resistant Materials
— Moderate to Low Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
Source: 1998 Workers' Survey (excluding Québec)

The distribute of skill usage was very similar in Québec.

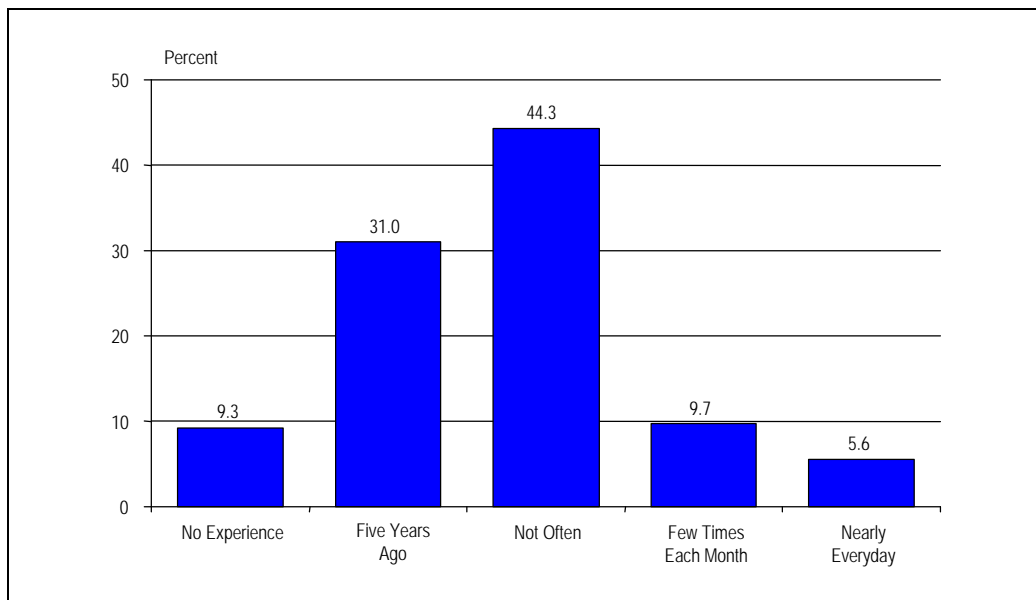
Build Walks, Patios, Piers, Garden Walls, Planters, and Other Similar Installations

The following three tasks were tracked for this work area:

- install masonry units;
- establish finished grade lines and slope for drainage; and
- lay, tamp, level gravel/sand bed.

Figure 5-25 shows 15% of respondents report working at least a few times a month to build walks, patios, piers, garden walls, planters, and other similar installations. The low level is expected since this sector is estimated to present only a small share (less than 1%) of the masonry market. If additional resources were required, 44% of respondents indicated they had some experience but didn't do it too often.

Figure 5-25: Build Walks, Patios, Piers, Garden Walls, Planters, and Other Similar Installations — Estimated Distribution of Work Experience

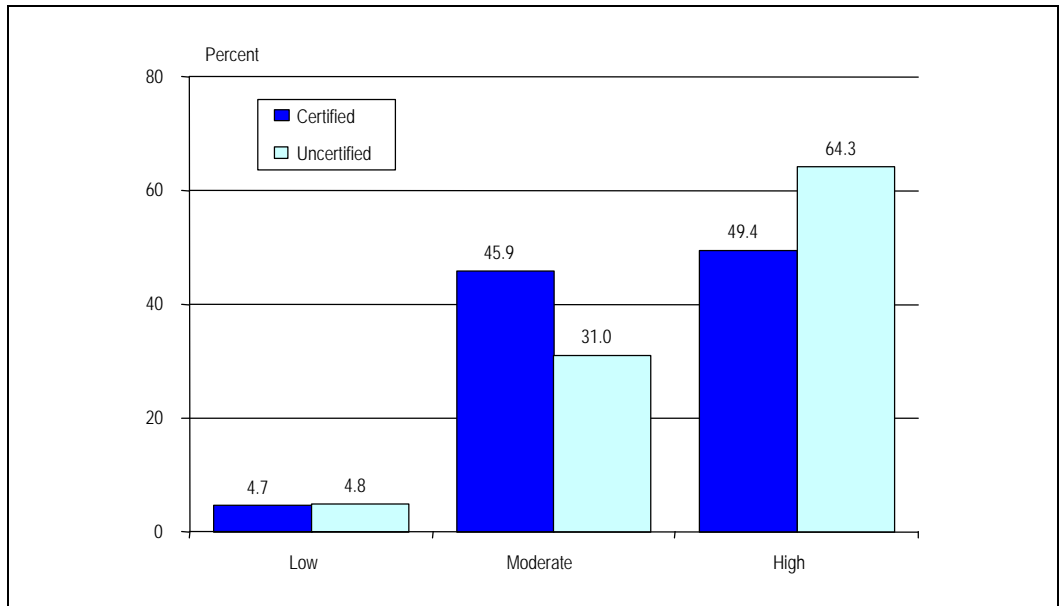


Source: 1998 Workers' Survey (excluding Québec)

The skill depth of those working in the sector is presented in Figure 5-26. Most workers apply two to three tasks on a regular basis with most of the activity concentrated on the installation of masonry units.

There was no significant difference between certified and uncertified workers. Work experience in Québec, however, was much lower than the rest of Canada. Seventy-seven percent of Québec respondents indicated they had little to no experience in this activity. For the most part, this activity falls outside masonry's jurisdiction in Québec.

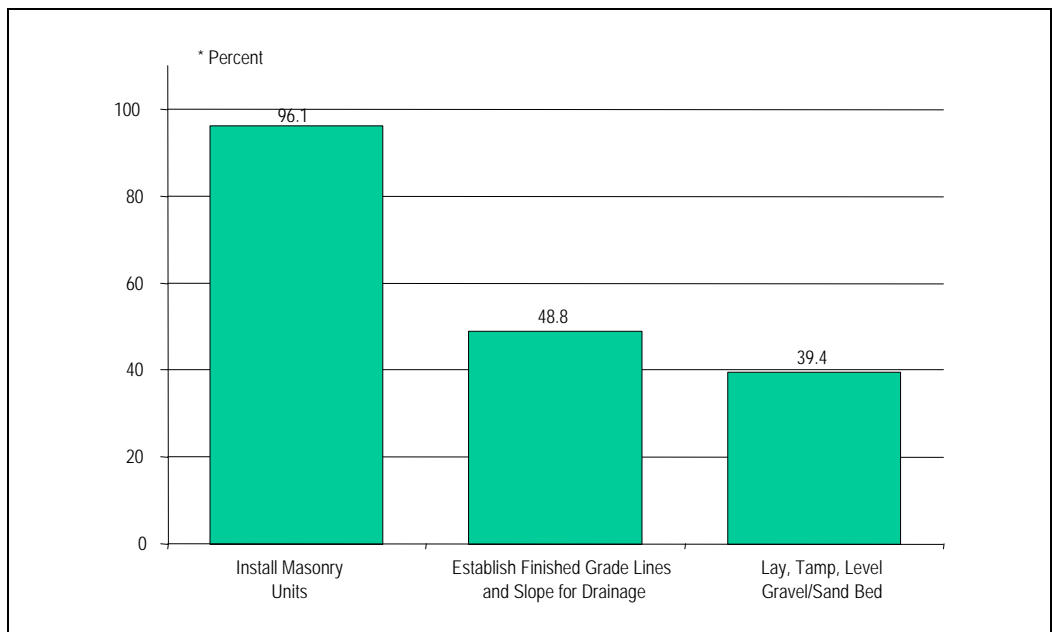
Figure 5-26: Build Walks, Patios, Piers, Garden Walls, Planters, and Other Similar Installations — Distribution of Skill Depth



Source: 1998 Workers' Survey (excluding Québec)

Figure 5-27 illustrates the proportion of respondents who work in the area and regularly carry out each of the tasks covered by the survey.

Figure 5-27: Build Walks, Patios, Piers, Garden Walls, Planters and Other Similar Installations — Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

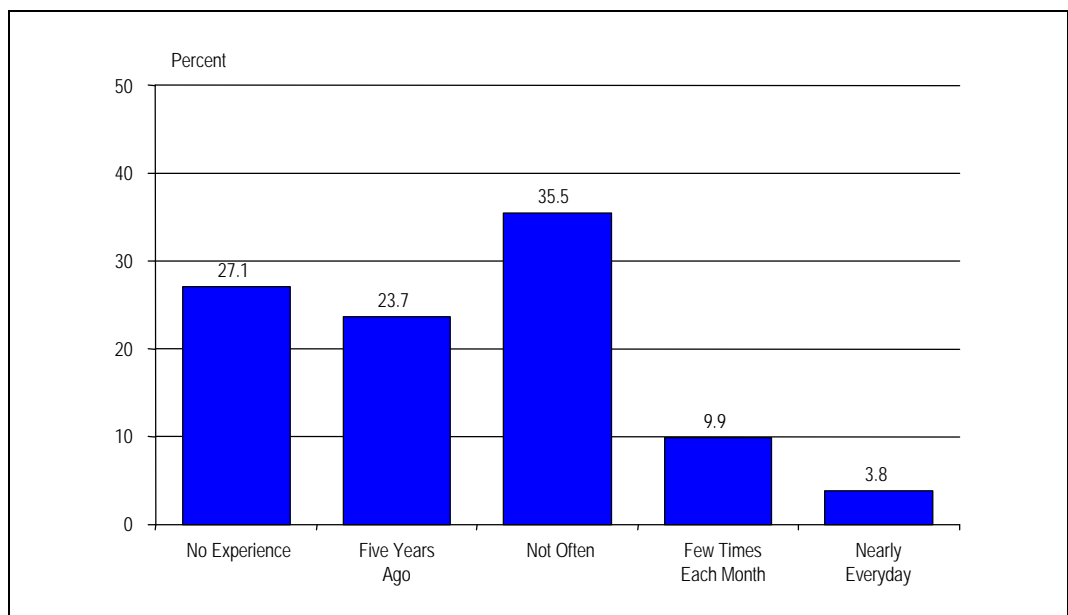
Restore Masonry Work

Restoration work is estimated to be the third largest component, capturing approximately 5% of the masonry market. For this analysis, 15 tasks or skills were assessed:

- ❑ establish depth of mortar deterioration and type of mortar required;
- ❑ remove mortar from joints using hand tools;
- ❑ remove mortar from joints using power tools;
- ❑ install shoring or needling under existing work;
- ❑ number, photograph, establish sequence of removal of masonry that is to be restored and replaced;
- ❑ perform plastic repairs using resins, polyesters, epoxies, etc.;
- ❑ perform pressure washing;
- ❑ perform micro-abrasive cleaning;
- ❑ perform chemical consolidation;
- ❑ perform special mortar repairs;
- ❑ use epoxy injections;
- ❑ perform Dutchman repairs;
- ❑ use pinning/stabilization techniques;
- ❑ carve stone; and
- ❑ use poultices.

Restoration work tends to be highly specialized, only 13.7% of respondents do this work on a regular basis. Based on the survey results (shown in Figure 5-28), over 50% of all respondents indicated that they had little to no experience in this sector. Because of the degree of specialty, it may be difficult to tap into workers who have worked in the area but not very often. As a result, the labour pool for restoration is small.

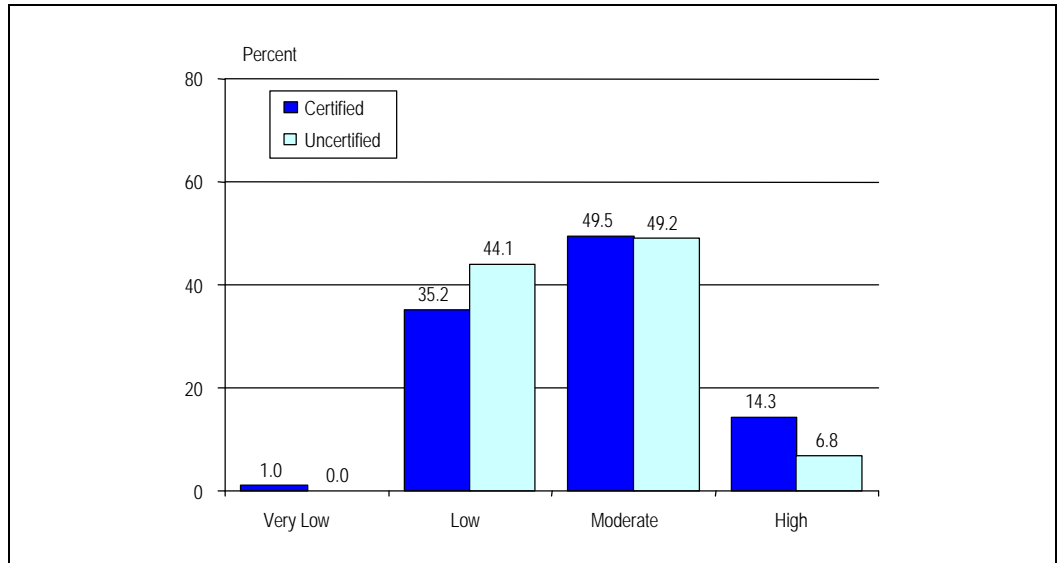
Figure 5-28: Restore Masonry Work — Estimated Distribution of Work Experience



Source: 1998 Workers' Survey (excluding Québec)

Figure 5-29 illustrates the skill depth among those that work in the restoration area. The results show that there are very few workers that apply all skills on a regular basis. There was no skill depth difference between certified and uncertified workers.

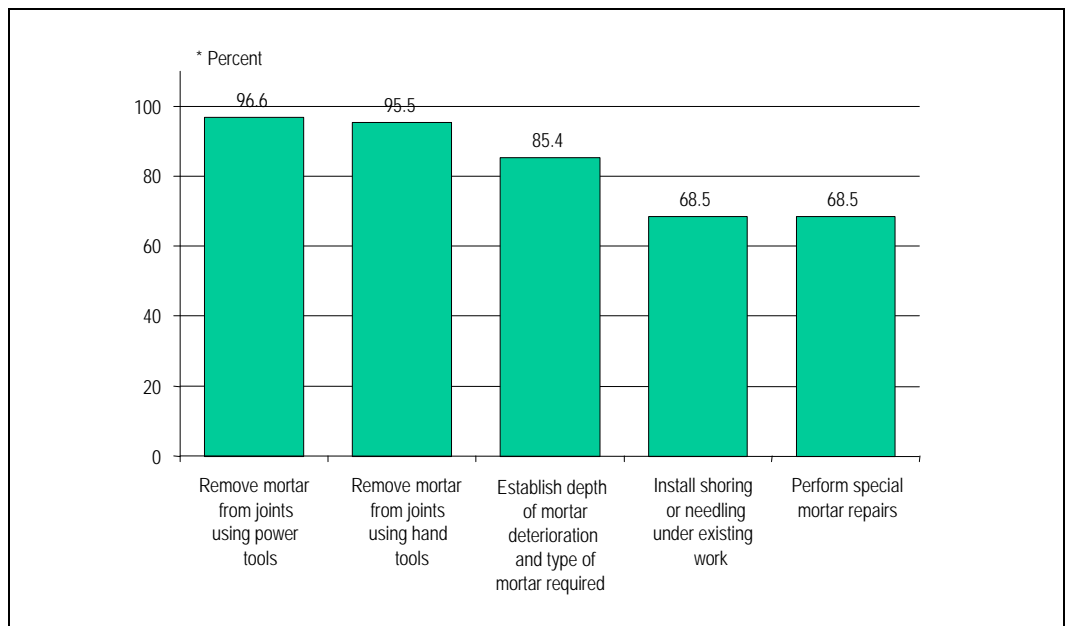
Figure 5-29: Restore Masonry Work — Distribution of Skill Depth



Source: 1998 Workers' Survey (excluding Québec)

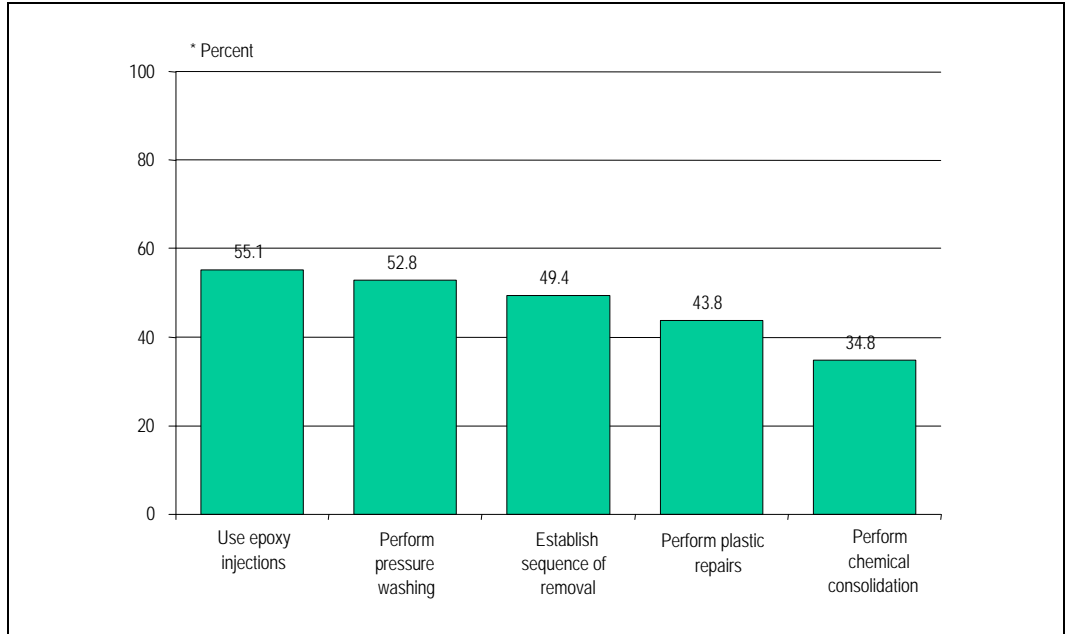
As presented in Figures 5-30 through 5-32, the most common tasks undertaken for restoration work are the removal of mortar from joints using power and hand tools.

Figure 5-30: Restore Masonry Work — High Skill Usage



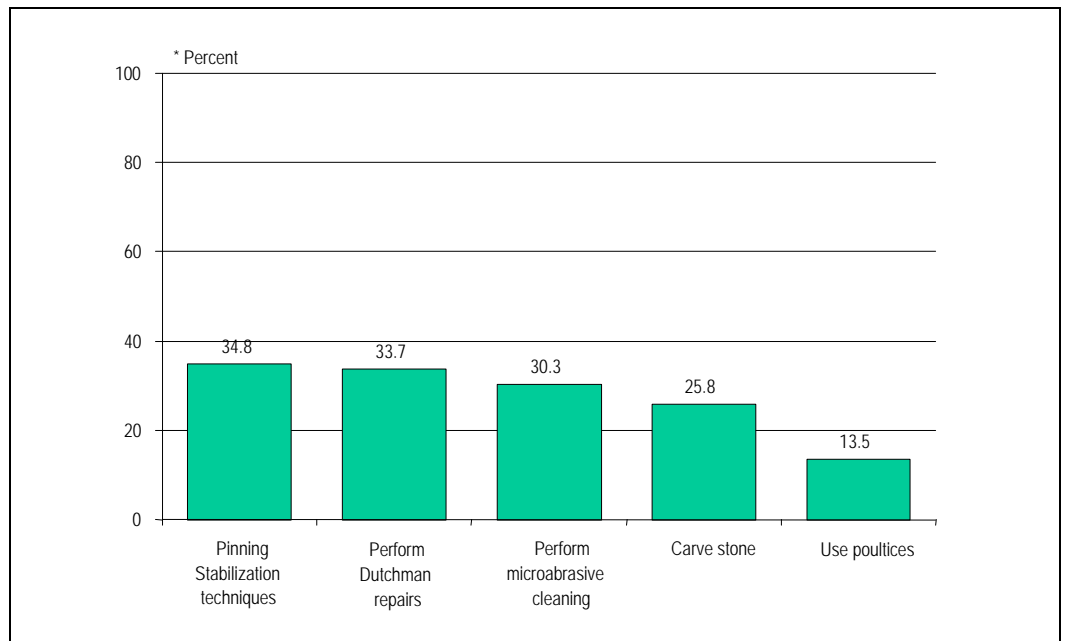
* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Figure 5-31: Restore Masonry Work — Moderate Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Figure 5-32: Restore Masonry Work — Low Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

The results for Québec respondents followed a similar distribution.

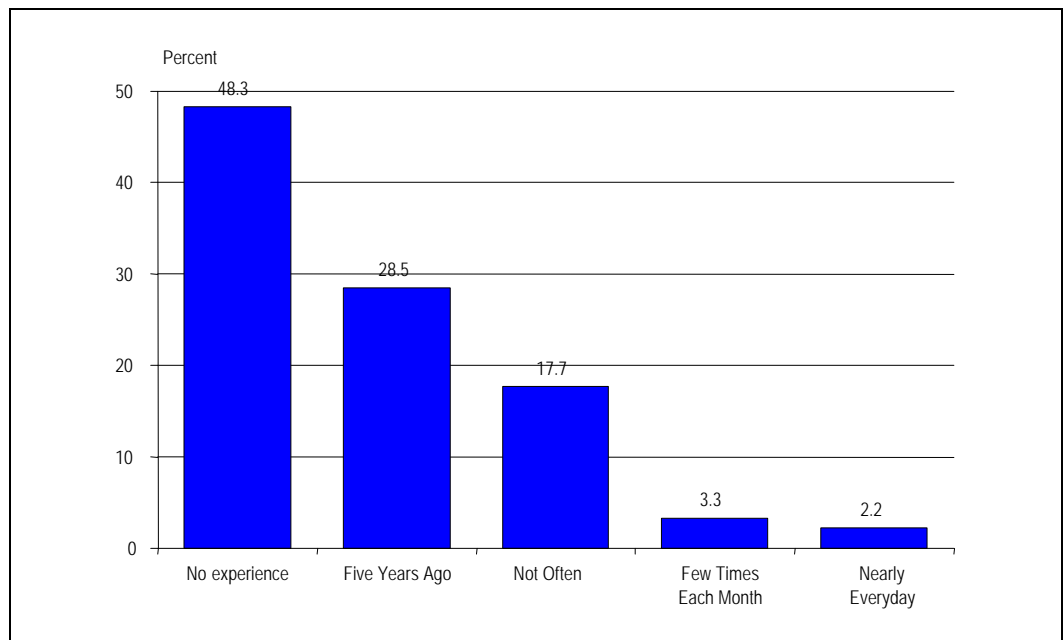
Work With Pre-fabricated Masonry Units or Pre-Cast Concrete Units

The following seven tasks were tracked:

- ❑ install bricks in jigs to pre-fabricate wall panels, column covers, etc.;
- ❑ bolt, grout, or weld panels in place;
- ❑ install knee braces/splice plates;
- ❑ repair panels;
- ❑ install pre-fabricated hollow-core floor slabs;
- ❑ install pre-cast concrete units; and
- ❑ install pre-cast concrete tilt-up panels.

Figure 5-33 shows there is very little work experience in the installation of pre-fabricated masonry or pre-cast units. Only 5.5% of the survey respondents indicated they work in the sector a few times a month or more. Increased activity in this sector will be faced with potential skill shortages.

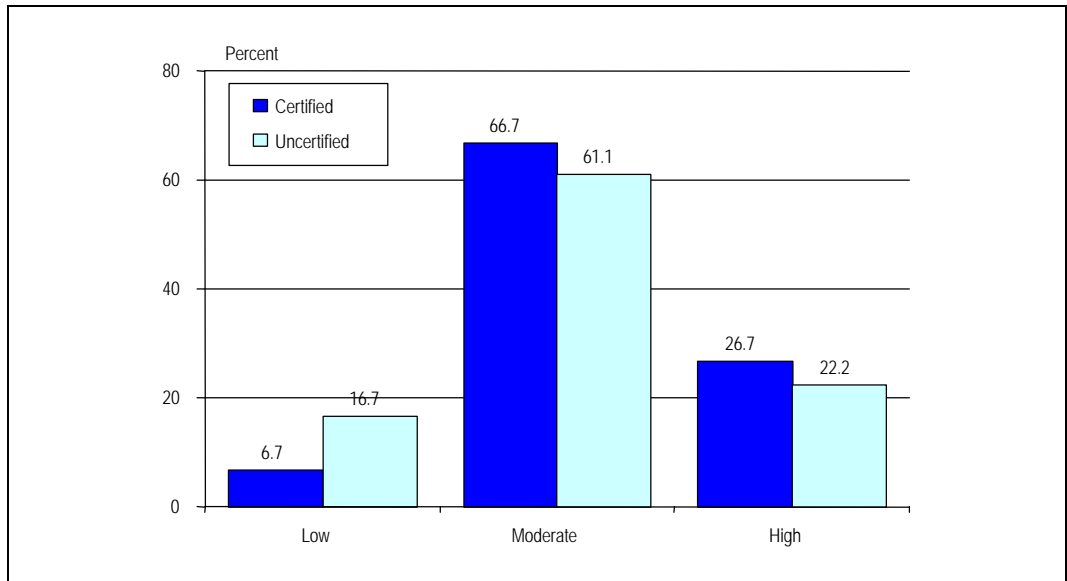
Figure 5-33: Work With Pre-fabricated Masonry Units or Pre-Cast Concrete Units Estimated Distribution of Work Experience



Source: 1998 Workers' Survey (excluding Québec)

Figure 5-34 shows that, of those working in the sector, workers typically use three or four skills on a regular basis (monthly on a daily basis). Certified and uncertified workers reported similar work depth in this area.

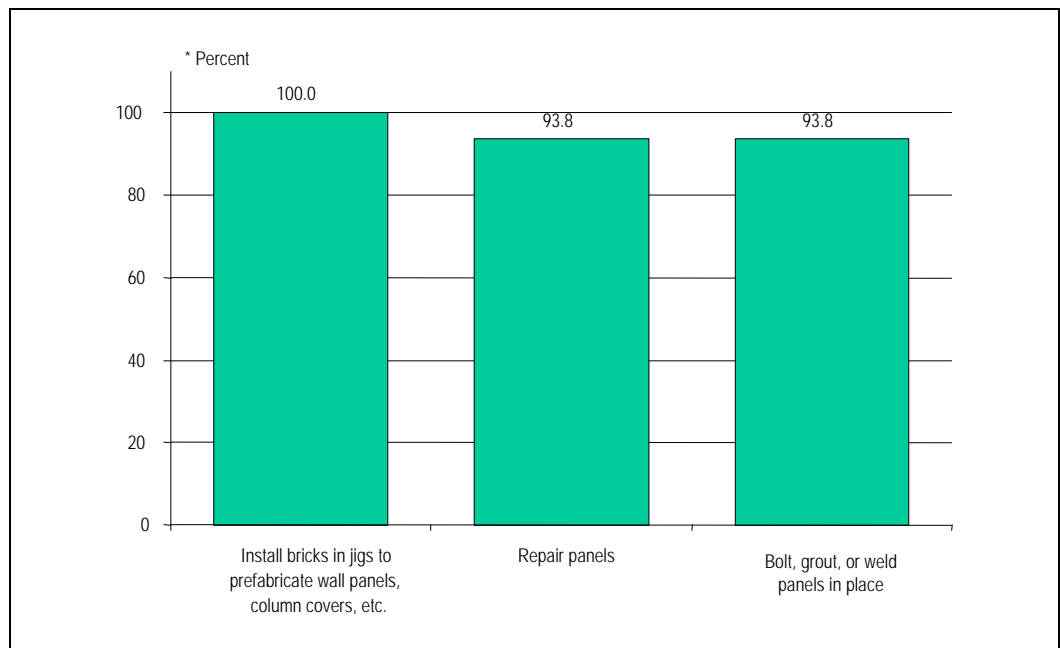
Figure 5-34: Work With Pre-fabricated Masonry Units or Pre-Cast Concrete Units — Distribution of Skill Depth



Source: 1998 Workers' Survey (excluding Québec)

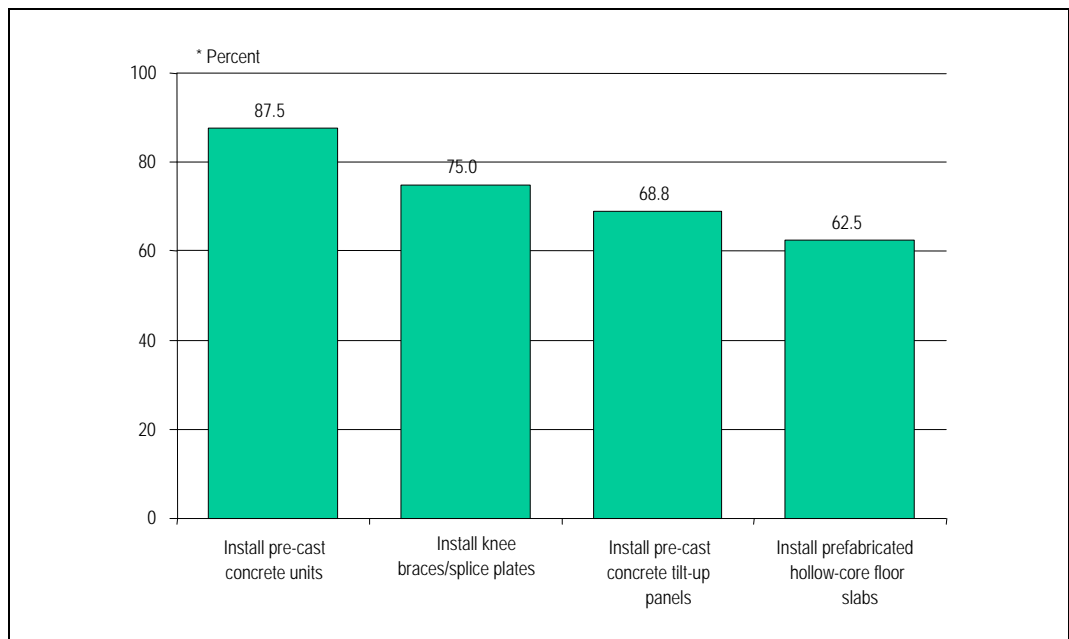
Figures 5-35 and 5-36 show the proportion of respondents who work in pre-fabricated masonry and report using a particular task on a regular basis.

Figure 5-35: Work With Pre-fabricated Masonry Units or Pre-Cast Concrete Units — High Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Figure 5-36: Work With Pre-fabricated Masonry Units or Pre-Cast Concrete Units — Moderate Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Québec respondents reported a higher proportion of installing pre-cast concrete units (100%) and installing pre-cast concrete tilt-up panels (100%) skills.

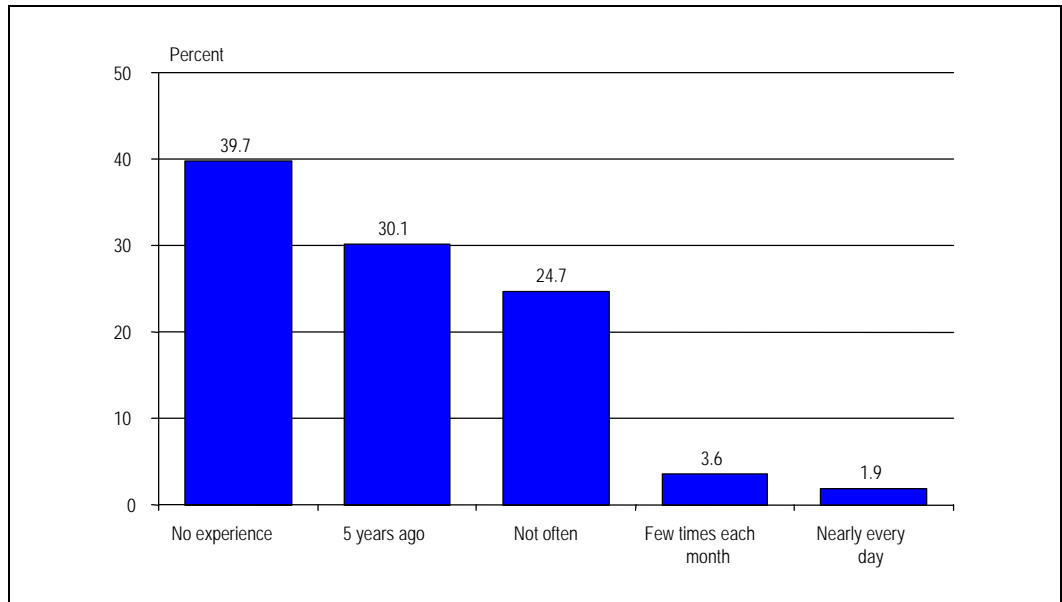
Install Granite/Marble Slabs

The final masonry sector assessed is the installation of granite or marble slabs. This area is estimated to account for 2% of the masonry market. The tasks tracked for this sector were:

- ❑ drill holes and cut slots in marble/granite;
- ❑ install inserts in concrete (e.g., struts, expansion shields);
- ❑ install overhangs with dowelled liners or “J” plates;
- ❑ cut out for accessories (e.g., electrical outlets);
- ❑ perform mechanical installation of marble/granite on walls;
- ❑ install marble/granite indoors by conventional/stacking method;
- ❑ install granite/marble on thresholds, backsplashes, shower seats, sills, or aprons;
- ❑ install slab floors;
- ❑ install pre-cast and slab steps; and
- ❑ weld/assemble anchor systems.

Figure 5-37 shows the distribution of work experience for granite/marble slabs. The results show that very few workers report experience in this sector. Only 5.4% of respondents indicated they have worked in this sector a few times each month or more. The low experience rate is a result of the work being conducted primarily by the tilesetter trades.

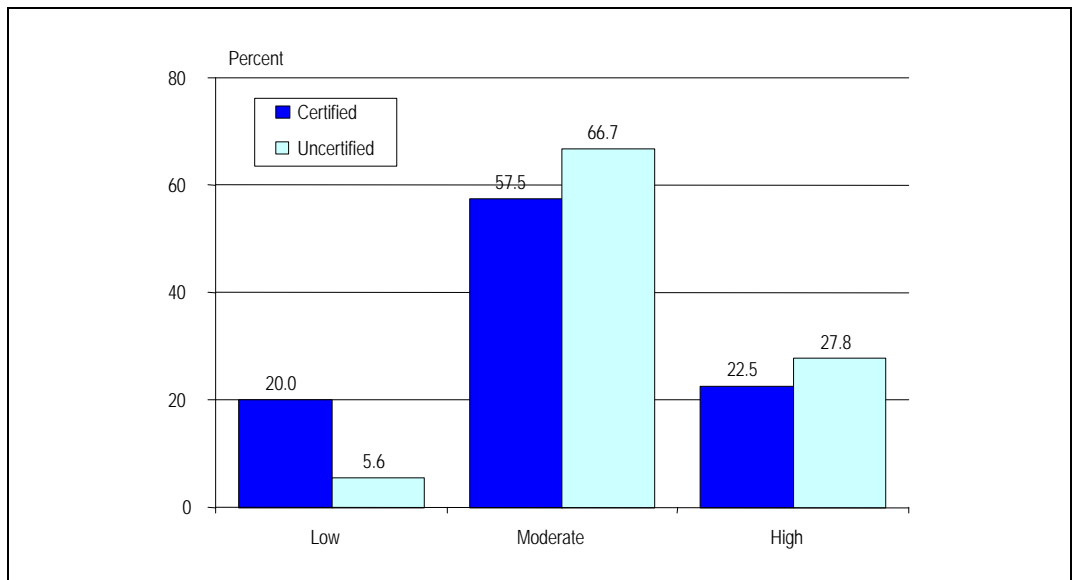
*Figure 5-37: Install Granite/Marble Slabs
— Estimated Distribution of Work Experience*



Source: 1998 Workers' Survey (excluding Québec)

Figure 5-38 illustrates the distribution of skill depth among masons who work in the area. The results indicate a majority of workers have moderate skill depth where they report a proficiency in four to six tasks.

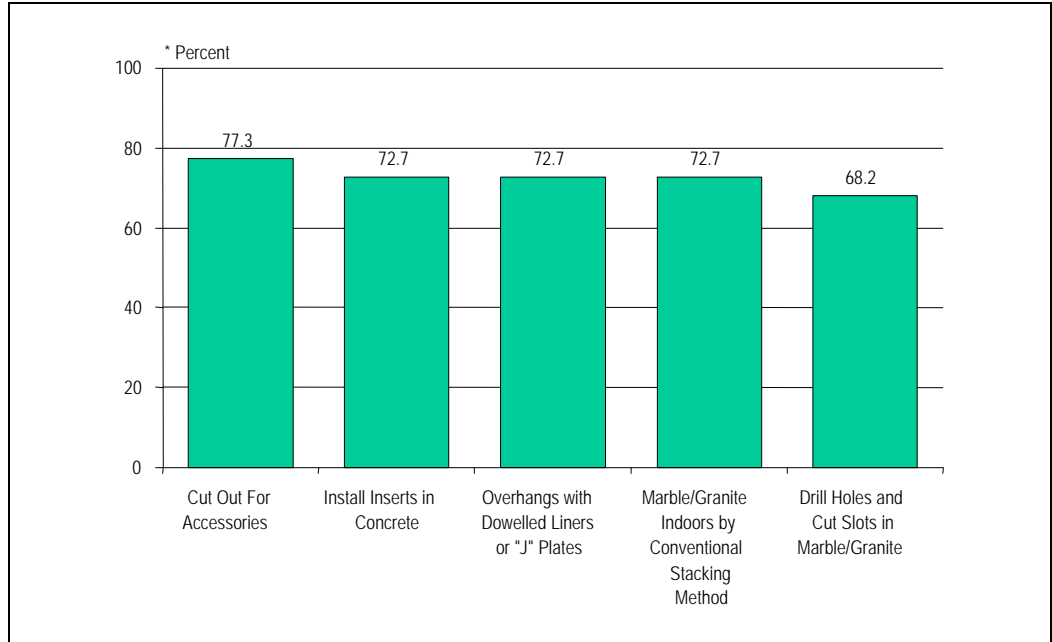
*Figure 5-38: Install Granite/Marble Slabs
— Distribution of Skill Depth*



Source: 1998 Workers' Survey (excluding Québec)

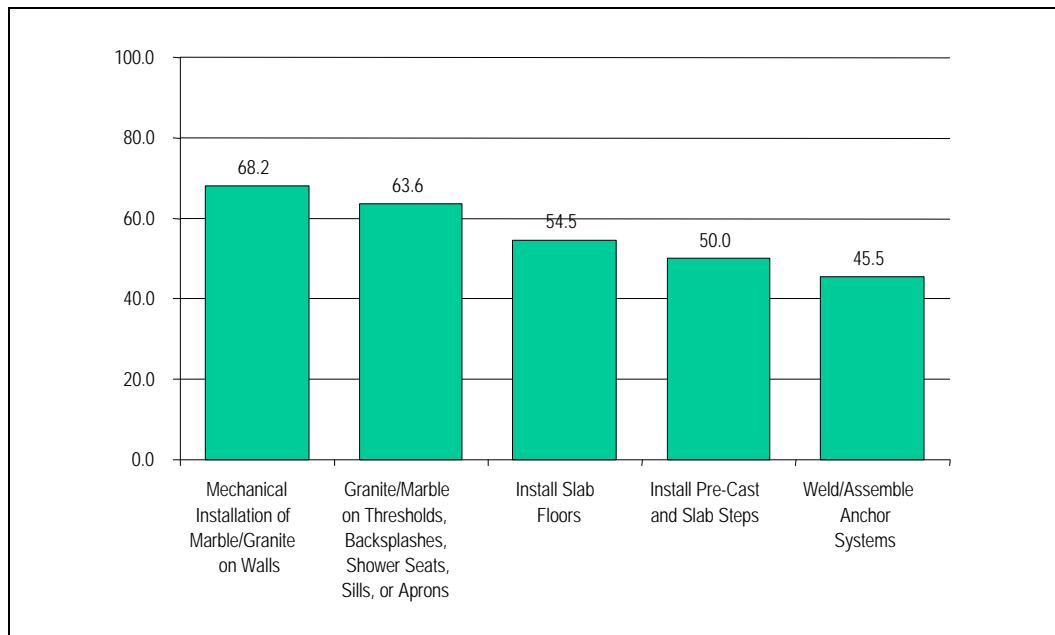
Figures 5-39 and 5-40 show the proportion of masons who work in the granite/marble slab area and regularly carry out the tasks covered by the survey.

Figure 5 39: Install Granite/Marble Slabs —



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Figure 5-40: Install Granite/Marble Slabs — Skill Usage



* Percentage of respondents doing a particular task or using a particular skill at least monthly
 Source: 1998 Workers' Survey (excluding Québec)

Conclusions

The section of the report provided an overview of the breadth and depth of bricklayer skills.

- there are skill gaps in health and safety and basic skills (math skills, reading blueprints) which need to be addressed;
- breadth (i.e., a higher share of respondents performing a minimum number compared to uncertified; the number of unionized respondents that are exposed to greater may skew the results; in terms of skill depth (i.e., the numbers of skills a worker regularly uses indicating that workers typically apply more than half the skills within an area on
- with the exception of foundations and walls, there was little evidence of depth difference between certified and uncertified workers; and
- higher skill depth compared to uncertified masons.

6. Contractors' Perspective

Key Findings

- Low profitability has had a negative impact on wage rates, making it harder to attract workers.
- Fragmentation in the industry and increasing use of competitive products has diminished market share for masonry.
- There are perceived shortages for skilled forepersons, and there is no upcoming replacements.
- There are mixed signals regarding certification. Lack of ability to enforce certification is a key concern.
- Apprentices are not receiving a breadth of on-the-job training.
- Industry has a poor perception of and a weak relationship with the PAC/TACs.

This section reviews the contractors' insights into the expected needs and preferences for skills and training for masons. Discussion groups with masonry contractors gathered valuable information and insight on current and emerging issues. Focus groups were organized in three regions and a contractor questionnaire was also implemented. The process allowed contractors to present their views on the labour market and overall industry conditions. This section presents the results of these groups and questionnaires, reflecting only the perspectives of participating contractors, on various industry issues at that time.

A discussion outline was prepared with the input of the Steering Committee, covering key topics:⁹

- market/industry trends;
- impact of technology;
- supply and demand for skills;
- retention/attraction of workers;
- certification, national standards and mobility;
- apprenticeship training; and
- journeyperson training/upgrading.

6.1 Methodology

In early January 1999, the Steering Committee (or those appointed by the Steering Committee) were asked to identify participants and assist in convening focus groups. In Atlantic Canada, a contractors' survey was undertaken to gather information instead of a focus group. The questionnaire was sent out to selected contractors in Atlantic Canada, and was also used in other regions to augment the focus group results.

The locations for the groups were as follows:

- Mississauga, ON;
- Calgary, AB (Prairie Region); and
- Burnaby, BC.

Groups were scheduled throughout February and March 1999. There were 21 contractors who attended the focus groups and there were 19 responses from the contractors' survey. The focus groups and survey provided vital information on industry trends and perspectives on how these trends impact on human resource needs. The results provide a better understanding of the demand for labour, skills and training.

⁹ A copy of the survey is included in Appendix C.

6.2 Trends in the Business Environment

This section presents an overall view of the business environment in which contractors employing masons are operating. It also sheds light on key trends that are impacting the industry and the demand for skills and training required from the labour force. The market conditions and trends play a large role in defining the actions which the industry can undertake to improve labour market conditions.

Business Conditions

At the time the groups were held, contractors reported business conditions as relatively weak. This has resulted in an increasingly competitive market, “with less work and more contractors going after it”. Contractors have experienced diminishing profits with a direct correlation to wage rates. Due to the weakness in the market, it has been difficult for contractors to maintain steady crews or take on and finish apprentices.

The increasing competitiveness in the masonry industry has also resulted in union contractors losing market share, due to cost structure. The issue was raised particularly in the responses from Atlantic Canada. Facing this loss of volume, union contractors are not able to retain skilled workers and offer apprentices continuity of work they require.

Most contractors reported that their profits have been squeezed and that even with the expected upturn in demand, it will be difficult to recover their margins. Wage rates are an important issue to employers as they impact bringing new entrants into the industry. In British Columbia, the group commented that “wage rates have not gone up substantially in ten years, in some places wages have actually dropped.... This makes it hard to keep anyone in masonry”.

Industry Trends

In addition to the weak demand for construction over the past several years, masonry has been experiencing loss of market share to competitive products. As one participant stated, “masonry has been greatly affected (reduced) by other products that are specified for construction”. Many of the competing products have been positioned in the market place as “systems”, while the masonry trade has become increasingly fragmented. Products or systems which have made in-roads into masonry’s market share include metal cladding, concrete pre-cast, tilt-up concrete panels, stucco products (EIFS), and vinyl. In addition, products such as cultured stone for veneers, mortarless retaining walls, Novabrick, artificial stone, all of which are positioned for the do-it-yourself market, are intruding on traditional masonry work.

As mentioned earlier, while other products have evolved into building systems, with some type of alliance between manufacturer and contractor, the masonry trade has become more fragmented. According to the group in Ontario, masonry has “only itself to blame for the decline in product usage.... for generations it (the industry) took care of itself... masonry did not advertise or promote its products... they let the market go”. Over the years, the industry fragmented, became more

focused on individual products, such as brick, block or stone. Players in each of the market segments ended up competing that in masonry “suppliers and manufacturers will not come to the table with the contractors”. The point is further illustrated in Ontario where a major company use they did not see a future for this product.

Another negative trend for masonry, which was echoed by all the groups, was the lack of design knowledge in masonry: “There is no focused perspective on design in who know how to do it or want to do it”. In Ontario, the Ontario Masonry Contractors Association (OMCA) has created provided by OMCA supports the creation of the first such research chair in North

ensure that current and future engineering students are taught cutting edge masonry design. One of the results from the lack of design knowledge is that buildings tend to be over- which is heavier than needed, which means that contractors have to use younger, stronger workers for this type of work.

Other trends that have negatively affected the industry’s market share include:

- charging a higher mark-
- limited life- which a ten-) coupled with the perception that masonry would be too expensive.

6.3 Technology/ Innovation

There were a number of equipment and material innovations noted by the contractors. For the most part these innovations have made masonry work faster easier to perform. Some groups had little to comment about technological change, as it was not identified as a priority issue for the industry. It was agreed, industry, which could increase productivity (i.e., output per hour worked) if market

Examples of technology that has been adopted by the industry include:

- -climbing (hydraulic scaffolding) platforms which are used as
- improvements to material handling equipment such as reach machines, and
- in B.C., the adoption of a scaffold net (prevents rainfall on materials) allows for work on rainy days;
- veneers more competitive;

- ❑ mortarless products, plastic block, cultured stone make the work easier and faster; however, they also allow less skilled workers to install the product; and
- ❑ new connectors.

Future changes could involve:

- ❑ post tensioning of load bearing concrete block;
- ❑ panelized brick;
- ❑ more use of light weight block;
- ❑ changes to building envelope systems;
- ❑ more engineered walls; and
- ❑ changes in tie reinforcements.

There was also discussion around technology that is available but has not been adopted by the industry, such as automated trowels and laser levels. These could speed up the process of laying brick.

6.4 Contractor Specialization/ Market Segmentation

As mentioned above, there has been a trend toward fragmentation within the masonry industry. During discussions with industry representatives and from the surveys, there was only a slight majority that indicated the demand for skills was becoming more specialized. However, participants expressed the sentiment that “a guy who is skilled (has breadth of skills) can be in demand for 12 months of the year, someone with a narrower skill base would only work eight months of the year”.

There are parts of the trade that are very specialized, such as refractory work. Workers in this market segment have specific skills that are not highly transferable into other segments. This precludes masons working in other market segments from moving to refractory work.

Contractors are also becoming more specialized, and therefore their apprentices have a narrower exposure to the trade during their on-the-job component: “If you build condos you don’t need to lay stone”. Another example of specialty work was reinforced masonry.

Another factor, which has lead to specialized masonry skills, was that the union used to differentiate between product applications: “You had a designation for the different segments — in some cities it is still fragmented between brick, block and stone”. In Québec this system of differentiation still exists. However, if masonry is going to promote itself as a building system, “we need workers who are well versed in all aspects of the trade”.

6.5 Supply and Demand for

Participants were asked to comment on the strengths and weaknesses of the

When asked which skills were some relating to hands-knowledge and basic skills. The contractors' survey identified skill weakness in the following areas:

- s and stone masons;
- understanding air barriers and insulation;
-
- lay-
- estimating;
- attitude and pride; and
-

Discussion in the groups reinforced the survey comments. The major weaknesses of kforce identified through the focus groups included:

the ability to plan ahead, staying focused on the task at hand, knowledge of

- the inability of most masons to read blueprints or basic layouts: "Most of them rely on the foreperson for everyt
- a lack of masons with a breadth of skills, who can do plaster, stone, fireplaces, flashing, cement work, foundations, brick and block and
- too few workers that can or want to take on foreperson responsibilities;
-
- a lack of stone masons and carvers: "There is not much work for these skills, however when you need them they are hard to find".

Forepersons and supervisors have to be more skilled today than ever and are harder

with the employer and were motivated to progress in their career. The period of weak demand in the early to mid 1990s discouraged workers from t responsibility: "These guys are in and out of a hiring hall — different employers". The weak market demand and mobility issues between jurisdictions contribute to a lack of steady employment.

A number of areas were identified where installation problems are most likely to

- flashing, air barriers and insulation;
- wall connections;
-
- head joints on structural masonry; and
- restoration and stonework.

In some cases the problem is simply because the mason is not familiar with the product. When asked about the frequency of work defects, comments ranged from: “Defects are almost daily — although sometimes minor” to: “About half the time if they aren’t supervised closely — can be very costly because margins are so tight” to: “Not very often, maybe once a year”.

In a number of instances, the shortage or need for mason tenders was identified. Their skills should include:

- ❑ erecting a scaffold;
- ❑ operating a forklift;
- ❑ mixing mortar (properly); and
- ❑ distributing materials on site.

The tender is a key factor in the overall effectiveness of a crew, and they make up approximately one-third of the workforce. Many tenders make it their career; they have no interest in becoming a mason.

The importance of basic skills was also brought up in the discussions. There is no doubt that the safety requirements demand greater reading and comprehension skills and that there is a need for some level of math, reading and writing skills. However, as one individual summarized, “you don’t need a Ph.D. to be a bricklayer — some of our best people are non-academic”. Currently the requirement is for a Grade 12 and some think that is aiming too high, while others indicated that good basic skills will allow a worker more career choices, e.g., becoming a foreperson.

Attraction/
Retention

Many contractors commented on the need for a well-rounded mason who could do all aspects of the work. At the same time, however, contractors are becoming more specialized, employing a narrower breadth of skills. The contractors are also coping with a high level of volatility in the volume of the work and therefore find it hard to attract and retain highly skilled workers.

Most contractors identified the issue of attraction and retention as significant and serious. The weak demand for construction, over the past several years, decreased the number of entrants into the trade. Contractors did not have the volume of work to start and finish apprentices, as they were having enough difficulty retaining their key employees. Union contractors stated that they in particular could not offer any continuity of work to a mason: “When a tradesperson cannot earn a decent living in his trade, how can you keep him? An unstable work environment does not attract new prospects”.

The average age of the masonry workforce is rising, and contractors agree that they have to bring young people into the trade. However, they face a number of difficulties. The lack of steady work makes it hard to present an attractive case for steady employment (although it is still possible to make a very good living at this trade). The seasonality of the work compounds that problem. Finally, the secondary school system tends to regard trades as a last resort for students who

lack the aptitude or interest in university education. For students who are actively dirty than masonry.

- usually select from their crew of helpers and/or mason tenders and sign unorganized sector);
word of mouth;
-
- post notice at EI offices;
call around to see
- through the union hall; and
use known journeypersons.

Another issue faced by the union contractors is entry to the trade and the progression from helper to journeyperson mason. In the union sector, helpers or mason tenders belong to another union and the wage differential between a tender and a mason is not all that great. Therefore, it is difficult to convince a tender to efficiency of a bricklayer, but the tender needs to have incentive to move over”. In moved to masonry. In the union sector, tenders are not a potential pool of labour for masonry. The -union sector, especially if the

6.6 Certification

mobility. There was a considerable range of comments about the industry’s support trade was a negative factor, making it more difficult to develop and maintain a skilled and knowledgeable workforce: “It makes more sense certification because of liability issues ... You want things built to a standard, therefore you need people to work to a standard”.

Others were rather indifferent to national certification as they could see no immediate benefits, and also comments that manufacturers and suppliers of masonry materials were not particularly interested in certification, therefore it would be up to the contractors t: “Support for certification is hard to estimate.... most endorse certification verbally, but in the field, the lowest

It was noted that the fragmentation of the trade is being exacerbated by the voluntary trade status. If a worker does not need to be certified in a wide range of skills which define the trade, it is possible for them to work at a specialized skill set, using only a narrow range of skills. It was also said that, “if a trade is certified there would be a better perception of the trade”.

Most believed that it is up to the industry to enforce certification, with the greatest responsibility on the contractors’ shoulders: “The onus will be on the masonry contractor to only hire masons with a certificate”.

There was concern expressed around the issue of enforcement of industry-wide certification. Lobbying the design industry and including the use of certified workers as part of the specifications were two potential solutions that were offered.

The IUBAC commissioned a research paper that focused on the costs of non-certification.¹⁰ This paper cites many important examples of poor workmanship, increased time loss injuries, increased WCB assessment rates and other costs. The paper advocates compulsory certification for the trade and cites European systems as important examples of successful training and certification.

National Standards There was overall support for having national standards, with some contractors feeling this was very important in order to ensure the trade remains intact and that there is a basic common core of skills. Other contractors stated that national standards are a “nice concept, but if your local is restricting your mobility that is a bigger issue”. Another concern around national standards had to do with national relevance as some participants indicated that “the dominant Ontario market dictates West Coast issues, which are not recognized”.

There are some ongoing initiatives being undertaken to raise the qualifications of employer/contractors, including the Ontario Masonry Contractors Association (OMCA) ISO 9000 Registration Program for its members and the WSIB sectoral safety group within rate group 741 for OMCA members.

Mobility There was no major issue identified concerning inter-provincial mobility. Age was mentioned as a factor that is limiting the movement of workers, as older workers are less willing to move to where the jobs are. According to one participant, “masonry has always relied on a mobile workforce — the problem is that older men are less willing to move about, the workforce is aging”. Both inter- and intra-provincial mobility are issues in refractory work.

¹⁰ See “the Economic Costs of the Non-Certification of Canadian Masons: An Analytical Research Paper Compiled for the International Union of Bricklayers and Allied Craftworkers” Prepared by Rhonda Day Bondonaro, McMaster University.

The bigger problem has to do with mobility between hiring halls. For example, “in one territory they have four hiring halls — and you cannot move people from one job to another”. This impacts the ability to maintain steady crews and to offer apprentices a wider exposure of on-the-job training.

The practice of limiting intra-provincial mobility has “taken a worker who has all the skills of the trade and reduced his ability to have access to the work, to such a degree that he just develops these little skill sets. This is because they do not have the mobility to work on a wide variety of jobs”. In some areas, apprentices are given more flexibility to move between job sites to give them continuity of work and a breadth of experience.

6.7 Apprenticeship Training

In some regions, such as Atlantic Canada and the Prairies, there was a general lack of satisfaction with apprenticeship training (in-school portion). Issues ranged from questions around the instructors’ skills, to the components that the contractors felt were left off the lesson plans. There was more satisfaction in B.C., and in Ontario, however in those regions it was felt that improvements could be made. In B.C., there are components of masonry which could be added to the outline, while in Ontario they felt a record book for apprentices is a needed improvement. The record book partly addresses the issue of apprentices who are not exposed to a breadth of skills during the on-the-job component of their training, by monitoring them.

The contractors definitely thought that the industry had a role to play in apprenticeship training. This included:

- being more active in curriculum development;
- being more involved in instructor selection;
- having direct input on the material taught in class; and
- supporting the training financially.

One of the biggest problems faced in all provinces is the fact that apprenticeship and certification are not recognized as industry standards. It is difficult to convince workers to give up earning money while they attend school, particularly when they can get work without being certified.

As noted earlier, attraction of bright young people to the trade is an issue. Weak demand has made it economically challenging to take on new apprentices and finish them. Contractors stated during a long period of weak demand, they do not present an attractive employment opportunity. This has left them susceptible to skill shortages in the near future.

Another problem with training an apprentice is that, in most cases, they are not exposed to a broad range of skills during the work phases. For example, Kingston, Ontario had a restoration boom in the early 1990s and “all those guys did was grind mortar joints... they did not learn how to use a trowel and they never picked up a brick”.

Some participants observed that there are contractors who will use apprentices as “cheap labour”: “Contractors will use 1st and 2nd year apprentices and not finish them — some of them have never been on the wall”.

In the Ontario refractory sector, some of the bid inquiries specify that only workers with a C of Q be used on the site. This means that refractory contractors need to indenture apprentices or hire certified masonry journeypersons. The problem for this sector is that there is little taught, in-school, about refractory and those that work in refractory do not attain any hands-on experience to work in other aspects of the trade. Therefore, there appears to be an issue regarding the relevance of training provided for this sector.

Contractors were concerned that in the past, journeypersons were more likely to pass along their knowledge to an apprentice. That seems to have changed as they now perceive them as competitors for their jobs: “Before you had a team of youth and experience — don’t see that anymore... there is no ownership of the work and therefore no vested interest”.

Contractors realize that they have a role to play in the training of skilled masons. However, they feel that they need to have some incentive if they are going to undertake more responsibility for the training. When asked about their perspectives regarding PAC/TACs, comments varied by region. In Ontario, the sentiment was the PAC system has fallen by the wayside, as the committee has not been very active. The response from Atlantic Canada was that government-operated advisory committees “do not do well, in fact they are useless as they do not understand the industry”. The B.C. group also felt that the TAC does not meet often enough and almost nothing is accomplished. The Prairies group had the most positive comments, indicating that the PACs play a role in implementing training and they have a close relationship with industry. However, they too indicated that the advisory committee should meet more often.

6.8 Journeyperson Training

There are courses and seminars available to journeypersons from suppliers and the associations. Many of the courses are in the area of safety, others introduce new products, such as vapour barriers. Contractors also feel that they are doing more training/upgrading than in the past. There are many incremental changes in the industry and people need to stay on top of them. None of the respondents were aware of any college-based upgrade programs.

Some contractors felt that upgrade training, at least for trade skills, may not be warranted as workers pick these up on the job. Most in-house training is in the form of on the job training or related to safety. Another issue identified is that only a small percentage of workers attend upgrade courses; most workers, even those who are certified, do not upgrade.

Overall, the contractors did not identify journeyperson upgrading as a major issue, but neither should it be ignored. Their more immediate concerns are focused on attracting new entrants and ensuring that there is a broad range of skills available. Workers that have been exposed to only a limited range of skills need more than refresher or upgrades to bring them up to the level of expertise needed by the contractors.

6.9 Key Issues to be Addressed

When asked what they would consider to be the key issues to be addressed, contractors identified the following:

- ❑ attraction of new entrants to the industry;
- ❑ difficulty in retaining workers and offering job security;
- ❑ the aging workforce and the possibility that increase in demand could result in shortages;
- ❑ fragmentation of the trade;
- ❑ ensuring that apprentices are exposed to a breadth of skills;
- ❑ certification across the trade and promotion of the benefits of certification;
- ❑ elimination of internal industry competition and promotion of the industry as a whole “system”, not a set of individual products;
- ❑ the need to educate buyers of construction to the benefits of using masonry products;
- ❑ the lack of manufacturer/supplier support for masonry, and the desire to try to bring these players into the fold;
- ❑ the lack of design knowledge in masonry;
- ❑ the need to improve mobility inter- and intra- provincially;
- ❑ development and enforcement of standards for the trade;
- ❑ the need for a better system of tracking on-the-job experience;
- ❑ quality issues around workmanship;
- ❑ dilution of the quality of the workforce due to black market construction; and
- ❑ ease of entry into some market segments, making it difficult to control quality.

7. Report on Technology

Key Findings

- Ongoing innovations have created a need for incremental upgrade training.
- There is a growing trend towards the use of pre-fabricated products which has implications on the skills required to do the work.
- Changes to the building codes are focused on making them objective-based, which in turn would facilitate the introduction of new products.
- Substitution of new products and materials that displace masonry is the greatest threat.
- Innovation in tools, materials and equipment have improved installation techniques and improved speed and reliability.
- Innovations with computers assist contractors with design, estimation, bidding and site management, but computers have had little impact for the workers on the job.
- Pre-fabrication of cladding and form work has displaced many traditional masonry products.
- Renovation and restoration work requires a broad range of masonry skills and is more likely to be done by older and certified workers.
- Restoration work is being done by other trades, including plasterers and steeplejacks.
- New products offer advances in work done in the masonry trades, especially adhesives used in tilesetting and cellular blocks in masonry.

This section presents a review of new and emerging innovations in materials, processes and applications in the masonry trade. For the purposes of this section, new technology is defined as:

“A new innovation in masonry work with respect to: system design, materials, methods in the applications of materials, system performance, tools, and maintenance, which could affect the quantity and/or the skill content, and/or time-input component of labour required for a given job.”

Over the last two decades, new construction techniques have had an uneven impact on trade-specific skill demands. Advance knowledge of the likely impacts of emerging technological change can assist employers, tradespeople, trainers, and governments in planning programs and other activities. Maintaining currency in training and upgrading programs requires that new skills be incorporated before, or as they are needed, on the job site. The emerging trends will not only affect the supply and demand for skills and workers, but significantly influence the type of training required and the apprenticeship selection criteria as well.

Technology has been traditionally defined to include materials, tools and equipment, and work methods. It is also important to recognize the effect of these factors on the health and safety of the workers themselves. The masonry trade faces high costs related to workplace accidents and illnesses, and it is important to understand how the technological aspects of the trade affects the health and safety of the workforce. One measure of these costs is high WCB assessment rates for masonry workers.¹¹ These concerns are also apparent in the results of the workers' survey done for this report and described in Sections 4 and 5. This latter source documents gaps in health and safety training in the workforce.

Some key questions are answered:

- What are the primary technology changes (construction processes, costs, productivity, profitability, etc.) affecting the masonry industry, currently and in the future?
- What are the main factors and motivations causing the adoption of new technology?
- At what point in the project cycle are the changes originating?
- Is change more prevalent in material manufacturing as opposed to the techniques used by contractors, and what impact does this have on industry structure?
- Has the adoption of new technology resulted in a change in the overall demand for labour, a change in the use of existing skills, or a need for a new set of skills?
- What are the effects of technology on the health and safety of masonry workers, and how can technology be used to reduce workplace accidents and illness?

¹¹ For example, the Association of Workers' Compensation Branch of Canada reports that WCB assessment rates for masons are consistently higher than most other trades.

7.1 Definitions

This section provides a brief description of the masonry and tilesetting trades.

Masons

Masons work with brick, block, stone and other similar materials to construct or repair walls, fireplaces, and other structures according to blueprints and specifications. In some jurisdictions, stone masonry is a separate trade from masonry, but it is generally a component of the broader masonry trade. Another specialized component of the masonry trade is refractory masonry (for use in furnaces, industrial chimneys, and other high temperature applications).

Tilesetters

Tilesetters work with a variety of materials, including ceramics, marble, terrazzo, and granite. They perform mostly interior, but also exterior work, and are able to install materials on walls, floors, ceilings, and in other specialized applications. Tilesetting may require heavy lifting, particularly when materials such as marble are being used. Tilesetting requires manual dexterity and creative skills.

7.2 Incremental Technological Improvements

Ongoing innovations in tools, materials, application and installation techniques have created (and will continue to create) slow but steady advancement in working with masonry products. Many of these techniques, materials and tools have been around for awhile, but either their availability is becoming more widespread because of decreasing prices, or they are being applied in new ways as the industry strives to enhance its competitiveness.

Some developments are trade-specific. For example, latex and epoxy additives have revolutionized tilesetting, resulting in improvements to quality and speed of installation. Other developments are not directly related to the masonry trade, but rather to construction in general (e.g., scissor-lifts, cordless/pneumatic tools, mobile platforms, etc.). Their impact in improvements to the speed, reliability, accuracy, and output of masonry work is evident and has caused a reduction in crew size (per unit amount of work) over the past decade.

Computerization

With very few exceptions, the masonry trade is characterized by individual or manual skills: hand tools, simple machines, and equipment are applied to cutting, shaping, and adhering masonry materials to a fixed base such as a floor or a wall. On many work sites, high powered saws or electrical mortar pumps (to speed up the process of grouting joints) constitute the extent of mechanization of the trade. It is one of the few construction trades where one is hard-pressed to identify some form of computer-operated or computer-controlled process undertaken by masonry workers on the job site. Examples exist, such as computer-operated cutting machines, but they are expensive and have not gained widespread use among small and mid-sized contractors; they are used more often by distributors and manufacturers who cut materials to manageable sizes on a custom basis.

Computerization has provided the end-customer with the ability to prepare drawings or estimates of their requirements and deliver them in an electronic format to contractors. This is not widespread in Canada, but there is evidence that it will become more popular, particularly with larger projects. Masonry contractors must be increasingly able to work with computers, to operate various types of estimating software and to interpret computer output properly.

One common computer application in the masonry trade involves estimating the amount of materials needed to complete a project with specified dimensions. Traditional coursing charts are invaluable in providing estimates — the dimensions of the project are calculated, and the user refers to coursing chart that applies to the brick and joint sizes that will be used. However, non-traditional sized bricks and tiles are becoming more popular, and designers are becoming more creative in designing masonry patterns with different sized bricks in the same application. This increases the possibility of error in estimating. Simple computer programs are now available that will allow a user to estimate jobs much more quickly and with less error. In fact, some brick manufacturers provide on-line coursing programs, tailored to their products, on their Internet sites.

More complicated masonry estimating software is also available. For example, contractors can purchase software programs that allow the contractor to develop complete estimates that consider any or all of the following:

- ❑ different types of mortar strengths, including an estimated quantity of mortar and sand required;
- ❑ openings (such as doorways);
- ❑ different combinations of masonry bricks or blocks, if they are required for the same job;
- ❑ rebar and grout requirements;
- ❑ sloped or step walls;
- ❑ concrete footings;
- ❑ different or multiple work crew requirements (if different materials are being used);
- ❑ covers, corners, and control joints; and
- ❑ caulking required around joints and openings.

Programs also allow contractors to generate bid proposals with customized letterheads and forms. In essence, once a contractor becomes familiar with the software, substantial time savings are possible when comprehensive estimating software is used.

Computer-aided design (CAD) is growing in popularity among architects and designers. It allows them to produce designs more efficiently, and it allows them to be more creative and complex as well. In tilesetting, manufacturers and suppliers are becoming more responsive to this trend. If provided with drawings or CAD files containing a desired design, for example, mosaic tile or terrazzo suppliers can generate and print computer-generated colour layout patterns using their products. These new design capabilities open opportunities for cost effective and creative applications of masonry.

It appears that one of the biggest effects of these trends at the job site is the increasing difficulty that masonry workers have in reading and interpreting computer-generated blueprints and specifications. More creative and innovative designs are also more challenging installations. In the workers' survey, respondents were asked to comment on their apprenticeship training, or provide comments on the type of upgrade training that they felt would be valuable to them. Results from the masonry/stone mason survey in particular indicated that blueprint reading and estimating were areas that they felt needed more attention in apprenticeship programs.

7.3 Use of Pre-fabricated Products and Substitute Materials

There is widespread agreement in the literature and among industry sources that the growing trends in the use of pre-fabricated products and modularization are among the most significant technological changes affecting the construction industry today. These changes are relevant in a number of respects. First, they represent new materials that will be used by existing masonry workers (e.g., masonry-veneer cladding or pre-built panels), so there may be an impact on crew size or skills required. Second, these changes may be taking place in other trades, and their popularity may affect the market share for masonry materials. Third, the use of pre-fabricated systems, such as cladding and form work systems, may pose jurisdictional threats on unionized work sites when the individual components that make up the system would ordinarily be covered by workers in different trades.

Pre-fabrication and modularization render the construction process more efficient in terms of time and cost savings; as the uptake/implementation of these technologies increases, the long-term impact is that many skills will be lost from the trade and work crew sizes reduced.

A pre-fabrication shop is essentially an assembly line operation in a climate-controlled environment, and the hourly wage is substantially lower than that an experienced journeyman commands. Large scale pre-fabrication shops are radically different environments from job sites, in terms of management processes, workforce characteristics, and individual attention to detail in the 'tradition of the craft' sense.

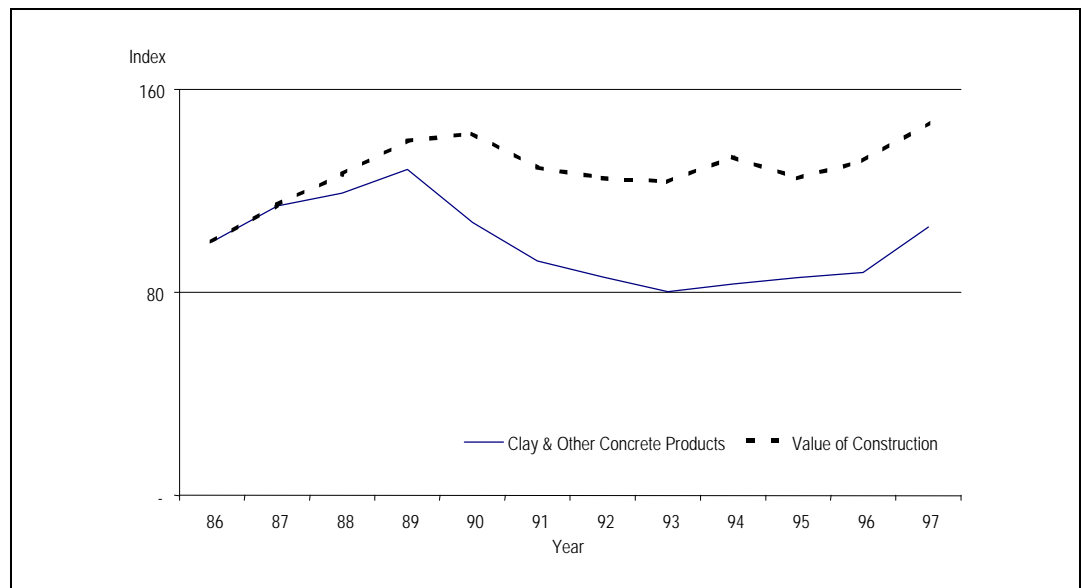
Pre-fabricated components arrive on the job site built to prescribed dimensions and fittings — putting them into the structure is reduced to a "installation" task; there is no need to create the unit on the job site, thus making many skills redundant. This is particularly true for pre-fabricated panel systems. The increasing popularity (derived from cost and time savings) for pre-fabricated systems will affect the demand for skilled journeymen. It will likely be accompanied by conflicts within and between trades as multiple components and materials are incorporated into single units and installation becomes straightforward and less technically challenging. The magnitude of this impact can only be measured when the market share for pre-fabricated systems is better understood.

These arguments also apply to the growing popularity of substitute materials. The price of substitute materials, such as vinyl cladding and vinyl flooring, are substantially lower than brick and tile in terms of up-front material and installation costs. In recent decades, design and construction philosophies, economic realities, and the increasing range of substitute products, have resulted in decisions to build 'faster and cheaper' rather than with 'long-term quality' or 'lower lifecycle/long-term cost' perspectives. Masonry manufacturers have attempted to address this by developing brick and tile products in different sizes, colours, or textures. Manufacturing processes, particularly in firing, glazing and cutting, have evolved such that the production of masonry products has become more efficient.

Nevertheless, the market share of masonry products has decreased substantially in the last few decades in Canada. While there are geographic pockets of vibrant activity in masonry construction, it is clear that substitute products represent a significant threat to the trade. Examples of substitute products include steel and poured concrete structural elements, metal buildings, steel and wood interior studs, alternative cladding materials such as vinyl siding, and mortarless brick used by landscapers and do-it-yourselfers. Polystyrene systems may also replace concrete block form work.

Further evidence of the apparent loss of masonry markets can be derived by comparing the overall level of construction activity with sales of masonry products. Historical analysis (in Figure 7-1) reveals that sales of brick, block and other clay and concrete products have lagged behind general building. Short-term shifts in various construction markets (e.g., engineering versus residential activity) may explain some of the change, but the overall trend suggests that less masonry product is being used in buildings now.

Figure 7-1: Manufacturing Link to Construction



Clay and Other Concrete Products — Value of shipments of goods own manufacturers and value of construction work purchased

Sources: Statistics Canada, Manufacturing Industries of Canada, National and Provincial Areas Cat. No. 31-203 and Construction in Canada Cat. 64-201

7.4 Renovation Work and the Execution of Greater Mechanical Skills

Evidence from the workers’ survey suggests that renovation work is being done by older, certified workers. Figure 7-2 illustrates this using masonry restoration as an example. Of the survey respondents who perform various restoration-related tasks on a regular basis (i.e., at least a few times per month), over 60% possess a trade certification. Depending on the task itself, between 34% and 61% of workers who perform restoration tasks are over the age of 45. A more detailed examination of the task breakdown is useful as well — for example, more than half of the respondents who carve stone regularly are over 45 years of age. Steps must therefore be taken to ensure that as these workers retire or leave the workforce, that younger workers possess sufficient skills to replace them.

Figure 7-2: Certification Status and Age of Workers Performing Restoration Activities Regularly

Task	% of Respondents Who Perform this Task at Least a Few Times Per Month and Hold a Certification	% of Respondents Who Perform this Task at Least a Few Times Per Month and are Over the Age of 45
Establish Depth of Mortar Deterioration and Type of Mortar Required	67.7%	39.8%
Remove Mortar from Joints Using Hand Tools	62.6%	37.5%
Remove Mortar from Joints Using Power Tools	63.6%	37.9%
Install Shoring or Needling Under Existing Work	76.3%	42.9%
Number, Photograph, Establish Sequence of Removal of Masonry that is to be Restored and Replaced	72.9%	47.8%
Perform Plastic Repairs Using Resins, Polyesters, Epoxies, etc.	83.7%	34.0%
Perform Pressure Washing	63.0%	33.8%
Perform Micro-abrasive Cleaning	64.3%	42.9%
Perform Chemical Consolidation	67.7%	43.2%
Perform Special Mortar Repairs	67.6%	38.5%
Use Epoxy Injections	67.9%	42.9%
Perform Dutchman Repairs	73.5%	35.7%
Use Pinning/stablization Techniques	77.1%	43.5%
Carve Stone	72.4%	51.4%
Use Poultices	72.7%	61.1%

In addition to a concern that older masonry workers are being relied on for restoration work, there is further evidence that other trades and uncertified workers are also working more in this area. Traditional masonry contractors face several challenges as they seek to retain or build their presence in restoration markets.

7.5 Use of New Materials

One of the major trends in the use of new materials is in the ingredients and effectiveness of mortars, adhesives, resins and grouts. These types of materials have been in existence for some time and the introduction and application of new formulations has been gradual and ongoing. Many tile industry insiders agree that developments in latexes, epoxies and thin-sets have represented the greatest improvements for the trade. However, there is a concern among workers that these materials (in particular, epoxies) represent a health hazard.

Characteristics of these newer materials include:

- ❑ greater extreme-temperature resistance;
- ❑ lighter;
- ❑ flexible/breathable;
- ❑ higher strength;
- ❑ less shrinkage;
- ❑ better slip resistance;
- ❑ greater chemical resistance;
- ❑ odour free installation; and
- ❑ rapid curing/setting.

A second major trend in the use of new materials is in the category of underlays and membranes. In tiling, the limitations of cement boards and fiber cement boards as tile substrates are being addressed by manufacturers. New tile backers are specially formulated to eliminate the need for additional vapour barriers and provide enhanced fire protection. They are also more lightweight and can be cut with hand tools rather than power saws. These features make installation faster and more efficient. Underlays are now made of latex, epoxy, polyacrylate, and other advanced materials. Exceptional bonding and levelling capabilities, improvements in compressive strength, large thermal and temperature allowances, and moisture- and fire-proof characteristics typify these products. Finally, membranes are becoming more flexible to install and apply; many waterproof membranes, for example, can now be applied with a paint roller rather than a trowel.

A third major trend is in the increasing range of masonry products. There appears to be a general trend towards the manufacture of larger brick units. The advantages of using larger units include reduced costs and speedier installation when cutting is not required. However, larger units are often heavier, resulting in a risk of back injuries and other muscle strains. It can also be argued that larger bricks require more cutting at ends and corners, in effect slowing down installation. Masonry veneer products, whether in panel form or in single units, are also enjoying some popularity as substitutes for traditional brickwork. One further example here is the use of mortar-less brick. This new product has the potential to displace traditional masonry under conditions that require less skill for installation.

There are ongoing enhancements to physical properties of masonry products. Aerated concrete blocks (or cellular concrete), chemical resistant, and autoclaved block are good examples of this trend — clay brick products still dominate the masonry market, but newer products incorporate fly ash, wood, and other types of

materials that provide advantages in terms of weight, ease of cutting, and other characteristics. In both tilesetting and masonry, manufacturer product lines have increased, in terms of sizes, colours, patterns, and textures.

Cellular block products offer a significant opportunity for the trade. These products are potential substitutes in interior framing and other applications. In this market cellular block is competing with wood and steel partitions. The natural advantages of the block material may be enhanced by price changes — in particular if wood prices continue to rise. A significant gain in market share in these uses would add a whole new dimension to demand for the trade. It would rebuild activity in regions where exterior brick cladding has been replaced by other materials.

This significant potential is prompting various industry activities. The Ontario Masonry Training Centre is focusing on this opportunity and new manufacturing facilities for these products are being established in south-west Ontario. This is an area to watch closely.

7.6 Design Codes and Regulations

In Canada, regulations pertaining to public safety are the responsibility of the provinces and the territories. Model building and fire codes are developed at the national level and these codes can be adapted and adopted by provincial and municipal jurisdictions, with modifications to suit local needs, climate conditions, etc. Over the recent past (and into the next two to three years) the model codes are undergoing major change — from being documents that are largely prescriptive to those based upon clearly stated objectives. These objective-based codes (OBCs), currently being developed by a task group of the Canadian Commission on Building and Fire Codes (CCBFC), are intended to clearly state the purpose of the requirements and refocus these documents on life safety, health and structural sufficiency of new buildings. The model codes include the National Building Code of Canada and the National Fire Code of Canada.

Design codes have a significant impact on the choice and use of new and/or different materials and installation practices. Accommodating innovation is one of the primary motivators for developing OBCs. The new codes will allow for alternative generic solutions by providing quantitative performance criteria and acceptable solutions. Proposals could be reviewed by CCBFC standing committees and if found acceptable, would be recognized in Part B of the Code. (Part A states objectives and functional requirements.) The codes are undergoing a consolidated review process. It is currently anticipated that the final version of the objective-based codes will be published in 2003. Once in place, the new OBCs will likely stimulate more rapid uptake of innovative technologies.

The new model National Energy Codes, published in late 1997, provide minimum standards for energy conservation practices in construction. These codes focus on life-cycle costing and “green” building, so that designers, builders, owners and users can make more intelligent and more rational long-term expense and energy-

related decisions, than was previously possible. There are actually two documents: the Model National Energy Code for Houses, and the National Energy Code for Buildings. While making these Codes mandatory are jurisdictional decisions, builders are finding that consumers and clients respond positively to these factors. The use of innovative materials and systems often has positive life-cycle cost, as well as energy considerations that result in lowering the “present worth” of energy requirements.

The federal government periodically provides financial incentives for builders of both residential and commercial structures to adopt energy-efficient initiatives. In one current initiative, the Commercial Building Incentive Program (CBIP), the federal government will provide a rebate valued at twice the estimated annual energy cost savings (to a maximum of \$80,000) for commercial and multi-residential buildings whose designs are at least 25% more efficient than the National Energy Code.

There is a mixed impact for masonry resulting from design codes and regulations. For example, the growing use of sprinkler systems reduces the need for masonry firewalls. As the use of sprinkler systems gained recognition in codes, the impact on masonry interior systems grew more severe. A further example of the impact of codes are new earthquake requirements that may result in fewer brick structures being built.

Masonry manufacturers are guided by industry codes, regulations, and tests. Some examples include: Tile Council of America tests/regulations; Ceramic Tile Institute test procedures; International Conference of Building Officials (ICBO) tests; and American Society for Testing and Materials (ASTM) tests (which includes the Robinson floor test). Brick and block tests and regulations consider characteristics such as size variances, acid solubility, elasticity, and abrasion resistance. Tile tests and regulations include: slip resistance/friction; water absorption; glaze hardness/scratch resistance; abrasion resistance; or breaking strength/load bearing capacity.

Other members of the masonry industry are self-regulatory. The Terrazzo, Tile and Marble Association of Canada, for example, produces annual maintenance guides and installation recommendations and specifications. A further example of industry self-regulation is the Quality Assurance Program of the Canadian Masonry Contractors' Association.

In summary, there are significant changes taking place with respect to building, fire and energy codes. These forces will not be felt for a few years, but they will undoubtedly improve the uptake of innovative materials and techniques — the masonry trade must position itself now to be ready for these developments. In particular the trade must be prepared for accelerated substitution of new materials for masonry products once the objective codes replace the prescriptive codes. The latter often specify masonry products — assuring a market in the past.

7.7 Environmental & Occupational Health Issues

Innovation in materials, equipment and working procedures are changing the health and safety environment for the masonry trade. In particular, systems are reducing the traditional, manual requirements and adding new precision skills. Similarly, tilesetting working conditions are changing to minimize health impacts when grouts and adhesives are being mixed, and materials cut. Equipment and training are altering the uncomfortable positions and repetitive hand-arm and knee movements that have caused musculoskeletal-related injuries such as back problems and tendinitis.

Improvements are being made to materials and tools and health and safety issues are being addressed by the industry. Environmental guidelines regarding dust control and ventilation are critical in the masonry trade. As will be seen elsewhere in this report, illness from airborne particles (such as dry saws) are recognized by the workforce as being a significant health and safety threat on the job site.

There is a need for practical and theoretical knowledge concerning suitable work postures and use of protective equipment; enhanced human health and comfort will translate into higher output and better worker retention. These are crucial goals that must be achieved through industry cooperation so that new recruits can be attracted to the masonry trades.

7.8 Summary

This section presented an overview of some key elements of technology that have the potential to impact the masonry trade. These impacts can be categorized as follows.

Impact on Demand for Man-hours

The Steering Committee reviewed these findings and other evidence as part of the preparation of scenarios for demand. It was agreed that, on balance, conditions will promote a continuing erosion of demand for masonry work — largely due to the substitution of new materials. This view is supported by historical data on employment and the opinions of contractors and suppliers. A specific adjustment is incorporated into the demand projections in Section 3 to reflect this view. Productivity or work displacement corrections are made by reducing the demand for masonry labour by 2% each year for a given level of construction activity. This implies that the volume of construction done in 1999 could be done by a workforce that is just over 20% smaller ten years from now. Implications of this assumption are discussed in Section 3.

Impact on Skills and Work Conditions

Findings reported in this section suggest the following impacts:

- ❑ new products and systems can be substituted for traditional masonry and these can be installed by other trades and less skilled workers;
- ❑ these products are often less expensive to install and this meets the needs of current market pressures;
- ❑ new masonry products have strong market potential based on new adhesives, mortar and grouts;

- changes in masonry products tend to be incremented and the trade remains largely manual or craft-oriented;
- restoration and renovation work are important markets that require a full range of masonry skills and may provide new demand for labour; and
- opportunities also remain for new work in stone masonry, detailed mosaic work, and terrazzo.

8. Training Opportunities, Apprenticeship and Access to the Trade

Key Findings

Apprenticeship and Equity:

1. Training is available in every province. However, the number of hours per term varies between 1,500 and 2,000.
2. Traditionally, Aboriginals and women have made up a low proportion of apprentices and journeypersons. However, due to the fact that the existing workforce and potential labour pool is shrinking, these groups could provide the human resources to meet the industry's future needs.
3. Access to labour has to be expanded. A large proportion of current apprentices and journeypersons entered the trade through knowing someone already in the trade.
4. The Aboriginal population has a younger age profile than the rest of Canada and 95% of Aboriginals do not attend university. Construction trades are considered a viable source of employment for this group.
5. There are a number of programs, both national and provincial, focussed on encouraging women to enter construction trades. These programs are quite new and although they have enjoyed success, to ensure longevity they have to work with the industry mainstream.
6. Lack of work and industry fragmentation are factors in the low rates of apprenticeship uptake and completion.
7. Nearly 50% of apprentices indicated in-school training missed necessary components.
8. There is a concern that in the late 1990s the number of apprentices entering the system will not be adequate to replace expected retirements.

8.1 Introduction

The purpose of this section is to evaluate training and apprenticeship issues as they apply to the masonry trade in Canada. This review includes an overview of training and apprenticeship requirements and opportunities, data on registration and completions, a discussion of equity issues, apprentice-specific results from the workers' survey and the National Apprenticeship survey, and a discussion around access to the trade.

Several factors work together to influence the nature of formal training and apprenticeship. They include:

- *Regulatory Requirement for Training* — Is there a legislative or regulatory requirement that workers be formally trained?
- *Characteristics of the Trade* — Is this a trade that one can learn on-the-job, or is formal training necessary in achieving competence?
- *Industry Demand for Improved Skills* — Are there skill gaps among existing workers such that certain types of work are not being done or are being done incorrectly?
- *Industry Demand for More Workers* — Do skills shortages restrict the operations of employers?
- *Technological Change* — Does the existence or introduction of new materials, equipment, or installation methods require that workers be formally trained?
- *Barriers to Accessing Training* — What kind of barriers are preventing workers from acquiring formal training?
- *Sources of Funding for Training* — Are training providers unable to offer programs or courses because of a lack of funding sources?

This section is divided into the following: methodology, including sources of information; overview of training and apprenticeship opportunities in Canada; entry requirements, equity issues entry and access to the trade; presentation of apprenticeship statistical data; discussion of factors which influence training and apprenticeship; summary and conclusions; and draft recommendations.

8.2 Methodology

Information for this section was gathered from several sources. First, efforts were made to compile an inventory of courses or programs offered by training providers throughout Canada. This revealed the extent to which formal training is offered, by both public and private training providers. Second, statistical data on apprenticeship was collected for each province. This provided information on the quantity of formally skilled masonry workers. Third, the national workers' survey included questions that would permit an analysis of respondents who were currently apprentices, or had completed an apprenticeship in the past. Secondary research was conducted to gather information on equity issues. Finally, insight on training and apprenticeship was offered by contractors during focus group meetings.

Investigation of Training Opportunities in Canada

Data on training and apprenticeship opportunities was gathered in three ways. First, data was collected from community colleges, primarily through Internet searches. Most community colleges in Canada have web sites that contain detailed information on academic departments and course offerings, including specific course outlines. The colleges that did not provide specific course information on-line were contacted by telephone.

While community college training is an integral part of construction trades training, well-developed programs are also available at trade union locals and industry training centres. Steering Committee members were asked about industry-sponsored training opportunities in their province.

Requests were made through provincial government departments of education and training to provincial directors of apprenticeship, who provided apprenticeship information directly, or supplied relevant contact information within their jurisdictions.

In Québec, the CCQ was contacted. Québec has a highly centralized and co-ordinated system of training. The CCQ compiles an annual directory of training opportunities for the forthcoming year in each of the construction trades.

Collection of Apprenticeship Enrollment Data

Provincial directors of apprenticeship provided data on the numbers of apprentices in their province, as well as a profile of the current group of apprentices in their jurisdiction. Data from the Statistics Canada Apprenticeship Enrollment Survey was also obtained.

National Workers' Survey

The survey provides both apprenticeship and non-apprentice data on influences to enter the trade, length of time it took to complete an apprenticeship, evaluation of the apprenticeship program, health and safety training, and upgrade training.

National Apprenticeship Survey

The National Apprenticeship Survey focused on respondents who were, at the time of the survey (1996), in an apprenticeship program. The data reflects the more current experience of apprentices, compared to the workers' survey that presents data from those who have been through apprenticeship training at some point in their career.

Contractor Focus Groups

Focus groups were conducted with contractors from British Columbia, Alberta, Saskatchewan, and Ontario. For provinces where groups were unable to meet, a small number of contractors completed detailed surveys (20 surveys).

8.3 Overview of Masonry Training and Apprenticeship in Canada

This section includes an overview of training opportunities for masonry workers in Canada.

There does not appear to be a significant amount of formal training taking place in the masonry trade in Canada at this time.

Figure 8-1 shows institutions provide formal (usually apprenticeship) training in masonry.

Figure 8-1: Training Delivery by Province

Province	Trade	Institution
British Columbia	Masonry, Tilesetting	<ul style="list-style-type: none"> ▪ Kwantlen College (masonry) ▪ Tile Training Centre
Alberta	Masonry, Tilesetting	<ul style="list-style-type: none"> ▪ SAIT
Saskatchewan	Masonry	<ul style="list-style-type: none"> ▪ SIAST
Manitoba	Masonry	<ul style="list-style-type: none"> ▪ Red River College
Ontario	Masonry, Tilesetting	<ul style="list-style-type: none"> ▪ Algonquin College ▪ IUBAC-IMI Local 25 (masonry incl. tile and terrazzo) ▪ Ontario Masonry Training Centre ▪ Tile, Terrazzo, and Marble Guild
Québec	Masonry, Tilesetting	<ul style="list-style-type: none"> ▪ 11 construction training centres throughout the province
New Brunswick	Masonry	<ul style="list-style-type: none"> ▪ NBCC at Saint John
Nova Scotia	Masonry	<ul style="list-style-type: none"> ▪ NSCC at Halifax
Newfoundland	Masonry, Stone Masonry	<ul style="list-style-type: none"> ▪ CCNA at Cornerbrook
PEI	--	--
Territories	--	--

Generally speaking, at least one community college or training centre exists in each province for masonry apprenticeships, but only three provinces conduct tile training on a regular basis. Training is offered on an as-needed basis at most community colleges; therefore, it is not uncommon that apprenticeship training may be suspended for at least one year due to lack of demand. Even when the programs are offered they may be operating at less-than-full capacity. In this case, workers from jurisdictions not hosting apprenticeship programs must travel outside their jurisdictions for training. This is particularly frustrating for workers living in jurisdictions with mandatory apprenticeship requirements for their workers.

While apprenticeships are open to all workers, upgrade/refresher training at industry training centres is often limited to union members only, because funding is provided by joint training funds.

Union locals are a popular training provider in the construction trades. In the masonry trade, locals provide regular health and safety training and a small amount of upgrade/refresher training, but do not conduct regular training programs. This is largely due to lack of funding assistance from the government, but is also due to low registration.

The International Masonry Institute (IMI) is an international labour-management organization serving unionized trowel trades and their contractors. IMI has established a number of training and technical service programs to support all levels of the masonry construction industry. IMI provides pre-job through to advanced training for apprentices and journeypersons through permanent area and satellite training centres and through the use of temporary mobile training units.

Manufacturers and suppliers are another source of training. They tend to provide training on a product-specific basis, usually upon the request of contractors who are using unfamiliar materials for a particular project.

On-the-job training remains the most popular form of training for masonry workers in Canada. It appears that a basic level of competence can be achieved by working with experienced masonry workers, provided that an experienced masonry worker is willing or able to mentor junior workers.

8.4 Entry Requirements and Certification

The information presented in Figures 8-2 and 8-3 are referenced from the 1997 Ellis Chart. The Ellis Chart provides information on masonry training and quickly illustrates the consistencies and discrepancies between provincial/territorial jurisdictions. Overall, there are very few characteristics reported that are the same for all the provinces/territories. In fact only two aspects are consistent for all provinces/territories: the availability of National Occupational Analysis and the availability of an Apprenticeship Program Outline and Technical Training Profile.

Figure 8-2: Ellis Chart for the Masonry Trade

Selected Characteristics	NF	NS	PE	NB	QC	ON	MB	SK	AB	NT	BC	YK
Apprenticeship Term — Years	4	4	3	3	3	4	4	4	3		4	3
Apprenticeship Term — Hours/Year	1800	2000	2000	1800	2000	1400	1200	1500	1600		1250	1800
Delivery — (T) Traditional, (I) Individualized, (B) Both	T	I	T	I	--	T	T	T	T		T	T
Pre-Employment Training(M) Mandatory, (V) Voluntary,	V	V	V	V	M	V	V	N/A	V		V	V
Apprenticeship Registration; (V) Voluntary, (C) Compulsory	V	C	V	C	C	V	V	V	C		V	V
Trade Qualification, (V) Voluntary, (C) Compulsory	V	C	V	C	C	V	V	V	V		V	V
Available for Apprentices:												
Technical Training Profile Available	Y	Y	N	Y	Y	Y	Y	Y	Y		N	N
On-the-job Standards/Records Book	Y	Y	Y	Y	N	Y	N	N	Y		Y	Y
Trade Qualification Exam	Y	Y	N	Y	Y	Y	Y	Y	N		Y	Y
Apprenticeship Program Outline	Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y
Commercial Text as Main Reference	Y	Y	Y	Y	N	Y	Y	Y	N		Y	Y
Modularized Learning Resources; (S) Self-contained, (R) Refer. to other info	B	B	N/A	S	N/A	N/A	N/A	N/A	N/A		B	N/A
<i>Availability at Provincial/Territory Level:</i>												
Progressive Examination	Y	N	N	Y	N	N	Y	N	Y		N	N
Practical Exam	N	N	N	N	N	N	N	N	Y		N	N
Written Exam	Y	Y	Y	N	Y	N	Y	N	Y		N	Y
For Journeypersons												
<i>Availability at Provincial/Territory Level:</i>												
Occupational Analysis	Y	N	N	N	Y	Y	N	Y	N		N	N
Upgrading Course Outline	N	N	N	N	Y	N	N	N	N		N	N
Updating Course Outline	N	N	N	N	N	N	N	N	N		N	N
Examination	Y	N	N	Y	N	Y	Y	Y	Y		Y	Y

Glossary of Terms:

Traditional Delivery	Formal in-school training that is delivered to a class of apprentices by an instructor (instructor driven).
Individualized Delivery	The delivery of the formal training component of apprenticeship by a facilitator in a classroom, shop or lab through the use of individual learning modules.
Individualized Apprenticeship Learning Modules	A set of learning materials that will allow an apprentice to progress through the in-school training component at their own speed with the assistance of a facilitator.
Apprenticeship Registration	A formal process requiring an individual to meet all the requirements for apprenticeship, including having signed an apprenticeship contract or agreement with an employer.
Technical Training Profile	A comprehensive portrayal of the knowledge required to perform the tasks within a trade.
Apprenticeship Program Outline	A list of topics and performance objectives to be learned during each period of an apprenticeship program's in-school training.
Progressive Exam	A document which lists the tasks, activities and functions that are performed by journeypersons within a specific province or territory.
Practical Exam	Performance tests used to determine whether an apprentice has successfully learned the practical skills required to complete the apprenticeship period or level of training.
Skill Profile Chart	A comprehensive portrayal of the major trade areas and associated tasks for a trade or occupation which an individual must successfully perform to meet job requirements.
Upgrading Course Outline	A refresher program which reviews the training content necessary to meet current journeyperson requirements.
Updating Course Outline	A curriculum outline which identifies the training content required to address technological change.

Review of specific characteristics shows the following:

- ❑ Provinces report the length of the apprenticeship program as three to four years; however, there is considerable variation in the number of hours that each year entails. In B.C., the hours required are 1250, while Nova Scotia and PEI are at 2000 hours.
- ❑ There is a high degree of inconsistency with the availability of trade qualification examinations and provincial/territorial progressive, practical and written examinations.
- ❑ Delivery of training includes eight jurisdictions offering traditional delivery, and two offering individualized.
- ❑ One province/territory reports having a journeyperson upgrading course outline, and none of the provinces report having a journeyperson updating course outline.

Figure 8-3: Educational/Entrance Requirements and General Information

Province/Territory	Entrance Requirement
Newfoundland	For theory hours and shop/lab hours it varies. Ratio: every shop/lab has one app. and one add for each qualified journeyperson employed. Grade 11 with courses in Mathematics and Physics.
Nova Scotia	Successfully completed Grade 12 or its equivalent in the course skills required by the trade/occupation. Theory credit. Graduates of the Nova Scotia Community College (NSCC) pre-employment program will be given credit for Block 1 theory and be permitted to write the Block 2 theory examination. If the graduate attains a mark of 70% or greater on the Block 2 examination, he/she will also receive a credit for Block 2 theory.
Prince Edward Island	Grade 12 or equivalent.
New Brunswick	Grade 8.
Québec	(DEP) Bricklayer (900 hours) or if labour shortage: general training units in the language of instruction, second language and Mathematics at Grade 10.
Ontario	Grade 8.
Manitoba	Grade 9, 16 years of age. The Apprenticeship Board of Manitoba is recommending that Senior 4 be the required academic entry level. The anticipated date of adoption is December 1997.
Saskatchewan	Grade 10.
Alberta	Provincial equivalency examination and qualification examination available. Grade 9 or entrance exam.
Northwest Territories	
British Columbia	Journeyperson/apprentice ratio and trade qualification mandated for "Fairwage" sites under "Fairwage Act". An entrance assessment process to ensure academic readiness is in place for all trades. Students are encouraged to complete Grade 12 with appropriate English, applied Mathematics and applied Science courses.
Yukon	In-school training obtained in Alberta. Academic Grade 10 or equivalent.

Source: 1997 Ellis Chart

The academic requirements vary across the country from Grade 8 to Grade 12. There is debate in the industry whether the benchmark should veer to the lower or upper end of that range. If the entry requirement is too high, some industry members feel that it will exclude a portion of the available labour pool. If it is too low, there may be problems with the math ability of the potential entrants.

8.5 Equity Issues

The participation of designated groups in all construction trades has been historically low. The purpose of this research was to determine what experience groups such as women and Aboriginals have had in respect to the trades and what barriers, if any, limit their access.

Demographic trends mean fewer young people are entering the workforce, although youth unemployment remains an issue. Combined with that trend is the fact that masonry, along with many other trades, is faced with an aging workforce, and a steep exit curve from the trade is anticipated. This means that at the same time that masonry will experience a need for new workers, the pool of potential new entrants is shrinking.

Groups designated under the Employment Equity Act (visible minorities, Aboriginals, women and people with disabilities) will be making up an increasing number of new labour force entrants. The integration of this group into well-paying, skilled and technical jobs becomes an important issue for both industry and government to address. Some provinces such as Québec already have regulation focusing on the number of women in the trades as well as Aboriginal policies.

As provinces continue to develop their policies and strategies toward apprenticeship training, designated groups are being given consideration. British Columbia is maintaining an emphasis on designated groups as part of its training strategy. This includes:

- ❑ developing guidelines and policies for addressing barriers to apprenticeship for designated groups;
- ❑ developing an 'Equity in Apprenticeship Plan' which would focus on shifting attitudes and behaviours so that equity considerations become a basic tenant of B.C.'s apprenticeship and training system; and
- ❑ working with TACs to develop a training module addressing diversity in the workplace and include it as a training component for apprenticeable trades and journey person upgrading.

In Ontario and other provinces, both industry and government state that the apprenticeship system has to have better linkages to the education system, so that it can be promoted to a younger and more diverse pool of potential entrants. If more high-school students were aware that they had the option to go into apprenticeable trades, it would result in less biased access. Currently, most apprentices enter training programs from recent work experience, not directly from school, and they usually know someone in the trade.

Aboriginal People

There has been very little accurate data to report the number of Aboriginal people participating in apprenticeship programs and working in construction trades. Even where the labour force is organized, union locals do not gather data by race. However, there has been traditionally a low participation by Aboriginal people in apprenticeship and the trades. In June of 1999, a report was published by the National Apprenticeship Committee of the Canadian Labour Force Development Board (in partnership with the Canadian Council of Directors of Apprenticeship, Human Resources Development Canada, Inter-provincial Alliance of Apprenticeship Board Chairs and the Aboriginal Community) titled “Aboriginal Participation in Apprenticeship, Making it Work”.

One of the report’s objectives was to assemble as much information as possible on apprenticeship and the Aboriginal experience in Canada. The report connects the best available statistical and descriptive evidence on this subject, with ideas on how to improve the development of new policy, programs and projects. It contains a number of case studies and concludes with some effective practices for Aboriginal apprenticeships. This section presents some of the key points from the report.

Key Facts

Of the 811,400 Aboriginal Canadian cited in the 1996 Statistics Canada Census:

- ❑ 53% are under the age of 25 years, compared with 34% for all Canadians;
- ❑ 45% are under the age of 20 years, compared with 27% of all Canadians;
- ❑ only 30% of those aged 18-20 years graduated from high-school;
- ❑ the Aboriginal population is growing twice the rate of non-Aboriginal people;
- ❑ the number of entrants to the Aboriginal workforce will increase by 75% over the next 20 years; and
- ❑ an estimated 95% of Aboriginal youth will not attend university and will either enter the labour force after secondary school completion (or less) or after completing a college program.

Despite the age profile and growth rate of the Aboriginal population, which makes them likely targets for entry into trades, there are some barriers to their participation in apprenticeship.

- ❑ Although statistics on Aboriginal participation in apprenticeship are lacking, it is evident from information reported by Aboriginal organizations that the majority of their youth do not know a lot about the skilled trades and apprenticeship programs.
- ❑ On the positive side, those Aboriginal youth which do have knowledge of construction, view the trades in a positive light.

Figure 8-4 contains information collected on the participation of Aboriginal people in major apprenticeable trades.

Figure 8-4: Number of Aboriginal People Compared with all Canadian Workers Employed in Major Apprenticesable Trade (1991)

Trade	Number Aboriginal	% of Total Aboriginal Employment*	Number Workers (all Canada)	% of Total Canada Employment
Cook	9,300	2.1	194,795	1.5
Carpenter	8,290	1.9	121,750	0.9
Automotive Service Technician	4,300	1.0	154,100	1.2
Welder	2,805	0.7	75,955	0.6
Barber and Hairdresser	2,315	0.5	92,310	0.7
Pipefitter and Plumber	1,770	0.4	48,720	0.4
Painter	1,680	0.4	37,065	0.3
Construction Electrician	1,595	0.4	55,090	0.4
Total	32,055	7.5	735,785	5.7

* Total Aboriginal Employment = 433,725

Source: Statistics Canada

We see that:

- the proportions of the Aboriginal workforce employed in the seven most populated trades are very similar to the proportions of all Canadians employed in those trades; and
- although the proportions working in the seven trades are similar, a higher percentage of Aboriginal tradespeople do not have their journey person certificates (according to Aboriginal groups that contributed to this research).

There are unique challenges to making construction trades such as masonry open and accessible to Aboriginal groups. Cultural differences play a key role. The report devotes an entire section identifying the challenges to entering apprenticeship that Aboriginal people face, and provides suggested resolutions to them.

These challenges range from a simple lack of awareness of apprenticeship programs, to potential candidates not knowing they possess the aptitude and basic skills, to the misunderstanding around the terms of indenture. In most cases, the solution focuses on culturally sensitive counselling, information dissemination, and testing. The challenges presented in the report are listed below:

- parents of prospective apprentices are unfamiliar with the wage economy and the work skills required to find and keep employment;
- youth lack an awareness of the possibilities in skilled trades;
- school staff have negative attitudes toward trades relative to professions;

- ❑ employment counsellors and teachers are not familiar with the apprenticeship program;
- ❑ apprenticeship system is not seen as relevant to people in Aboriginal and northern communities;
- ❑ Aboriginal people do not trust what they are told by non-Aboriginal people;
- ❑ candidates have low levels of education and lack entrance requirements in some subjects;
- ❑ candidates lack necessary learning skills;
- ❑ candidates have poor orientation to skilled trades requirements and lack of basic trades skills;
- ❑ candidates do not know if they have the aptitudes and basic skills needed for apprenticeship (pre-admission testing is culturally biased);
- ❑ labour market demand is weak;
- ❑ few apprenticeable positions are possible;
- ❑ number of apprenticeship positions varies over time making completion risky; and
- ❑ Aboriginal people find it difficult to approach employers to find apprenticeable positions.

The report contains a section on recommendations, some which are based on initiatives that are already underway, even if only in one or two areas. The recommendations fall into four categories: roles and responsibilities, criteria for success in program/project delivery, alternative or additional approaches in apprenticeship delivery to meet Aboriginal needs, and promoting apprenticeship.

The report concludes that apprenticeable trades are a very useful means to increase employment among Aboriginals. At the same time, Aboriginals would provide a growing pool of labour to construction, when shortages are a possibility. However, in order to make this opportunity viable, the construction trades and government agencies will have to work together to encourage and support Aboriginal participation.

Women in Construction

In the last few years, there has been considerably more attention focused on women in construction. There are national groups, which have been working diligently to encourage more women into the trade and to assist them in staying with the trade once they have received their certification. There is some data available on women in the trades, particularly participation in apprenticeship programs. Further information was gathered through discussions with locals and representative from groups that represent women in trades.

The low participation rate of women in trades is corroborated by data from Alberta Apprenticeship and Training, where female participation by trade is around 1%. Data for Atlantic Canada shows that women comprise less than 1% of apprentices and journeypersons.

Low participation rates for women are not related to direct barriers, but reflect traditional views on women undertaking this type of work. There are hidden or systemic reasons why women do not populate this trade:

- ❑ to date the representation of women in non-traditional jobs is not equitable, although more women are entering these fields;
- ❑ there are physical demands in some aspects of the trades that some women would find difficult to handle;
- ❑ there is the issue of working in all-male crews where the environment tends to be sexist;
- ❑ in the training process, women are given the easier tasks to perform, and are not being trained in the full spectrum of functions;
- ❑ women do not have the pre-training and experience/knowledge necessary to be able to even make a choice to go into the trade; and
- ❑ women often do not have the contacts with the industry that men have and therefore are at a disadvantage in getting jobs or even getting accepted as an apprentice.

Finally, masonry, along with other trades, has not been presented to women as a viable career opportunity until recently. According to Women in Trades and Technology (WITT), “Apprenticeship has not been given a high priority provincially and equity has been given even less. If provinces were serious, they would mandate their apprenticeship counsellors to go out and sell apprenticeship to employers and unions”.

“Despite employment equity legislation, the Federal Contractor’s Program and other long-term government policies, such as HRDCs Designated Groups Policy, barriers to occupational integration still exist and women’s work remains segregated. These barriers include inappropriate training, discrimination in hiring, harassment and family responsibility problems. These factors may be encountered, or reinforced by the attitudes, approaches and actions of employers, educators, managers, supervisors, labour representatives, co-workers, family and friends.”¹²

The Hibernia Oil Platform Construction Project has served as a testing ground for several public policy initiatives to promote employment equity for women. To evaluate the effectiveness of these policies, a report entitled “Women, Employment and Equity and the Hibernia Construction Project” was written by WITT (Newfoundland and Labrador). The report was based on interviews of women working on the Hibernia oil platform. The report examined the involvement of these women in employment and training related to the Hibernia project and assessed the extent to which they have been able to participate as equal members of the project’s labour force.

¹² Women in Technical Work in Atlantic Canada, March 1998.

The report indicated that despite some efforts to integrate women into the project workforce, women experienced barriers to full and equal participation that began at the training level and continued through to lay-off decisions. The study found that women were harassed and were not allowed to do the work for which they were trained, with many feeling they had no opportunity for advancement. The report determined that the equity policies in place were insufficient and those that were in place were inadequately monitored and enforced by the government.

In a similar review of the Confederation Bridge (PEI Strait Crossing), it was found that:

- 784 men and 38 women (4.6%) received training for the project;
- women were trained in post-tensioning and rebar work, and 36 completed the training; and
- the majority of the women were hired in construction maintenance positions, flaggers and maintenance (janitorial) workers on the support ferries.

The following recommendations were made in the report “Women, Employment and Equity and the Hibernia Construction Project” regarding equity issues:

- women’s committees should be set up in order to involve women in the process and to inform management and unions of women’s experiences living and working on-site;
- the work camp environment should be changed to make it safer and more acceptable to women;
- any project agreement between management and the unions should contain an employment equity clause requiring that a certain number of women be trained and hired for the project, and should spell out a policy on sexual harassment;
- governments should enact legislation to require all major projects which receive government funds implement employment equity policies; and
- HRDC should follow the guidelines in its Designated Groups Policy and make funding dependent upon the implementation of employment equity initiatives.

WITTs three-year pilot project to develop an innovative curriculum for high school aged women and encourage them to enter careers in construction has recently wrapped up. This program ran at six high schools across Canada and was initially funded through HRDC Youth Internship Project funding. The schools that participated have committed to offering more classes even after the initial funding is over. The program is now being developed and implemented at several new sites across Canada.

The WITT National Network is currently developing a new program, “Learning Partnerships”. This program will reach out to different clients, such as Aboriginal women, young women seeking credit courses to complete Secondary School and women in Corrections Canada institutions.

WITT also offers exploratory courses and bridging programs to compensate for systemic barriers in formal and informal education. Exploratory courses also include a focus on examining labour market trends and employment opportunities in trades and technology. These courses act as “feeders” into the more traditional apprenticeship training.

The hope is that, as women undergo career re-training or look for post-secondary school opportunities, construction will be one of their options. It is the position of groups such as WITT, that special measures are necessary to overcome the effects of past discrimination, regardless of whether that discrimination was overt or systemic. WITT has espoused the following recommendations or suggestions to make the trades more accessible to women:

- ❑ Make space available in training programs for women coming out of exploratory courses, as sitting on long waiting lists could discourage individuals.
- ❑ There has to be a change in workplace culture to foster a more accepting training environment (this includes employers, unions and other employees).
- ❑ There should be re-training for instructors to help them understand and develop strategies for teaching a greater diversity of learning styles.
- ❑ More accurate information about apprenticeable occupations and how to access them must be made available to junior and senior secondary school counsellors and community-based groups working with designated groups.
- ❑ Unions must take seriously their commitment to equity by actively recruiting women and providing support systems.

The masonry trade should keep in mind the position of equity groups as it works to develop new training programs and encourage individuals in these groups to become skilled and valuable members of the workforce.

8.6 Entry and Access to Training

This section discusses the barriers that face potential entrants to apprenticeship programs, as well as presenting material from the National Apprenticeship Survey.

The barriers or challenges to apprenticeship entry and completion are similar for many of the trades, although there are certain challenges that are more pertinent to one trade than another. The list of challenges to apprentices presented below comes from a presentation made at the Canadian Labour Force Development Board (CLFDB) National Apprenticeship Conference:

- ❑ unfamiliarity with the trades/negative attitudes toward employment in the trades;
- ❑ lack of knowledge about apprenticeship training programs and entry requirements;

- ❑ lack of recognition of training and previous work experience;
- ❑ stereotyping and cultural barriers to work in trades;
- ❑ lack of apprenticeship positions with employers;
- ❑ availability of child care and other support;
- ❑ technical language barriers and learning styles;
- ❑ loss of apprenticeship positions with employer due to shortage of work; and
- ❑ insufficient earnings to complete the in-school training.

For masonry, these challenges are exacerbated by the fact that, outside of Québec, Nova Scotia and New Brunswick masonry is a voluntary trade. Therefore a person can work in the trade without seeking formal certification. In order to go through the apprenticeship program, the worker must perceive benefits from certification and be financially able to complete the in-school portion. In discussion with industry representatives, the theme of attraction and retention of capable learners and skilled workers was prevalent. The problem that the industry faces is how to attract bright and enthusiastic apprentices and offer them a career path. It is difficult to present an attractive offer to a potential entrant when demand has been weak and there is no guarantee of steady work. Furthermore, the fragmentation of the trade discourages training and developing a broad range of skills.

The following information is based on the results of the National Apprenticeship survey:

- ❑ 46% of masons were out of high school for seven years or more before they entered an apprenticeship program;
- ❑ approximately one-third of the respondents completed high school; and
- ❑ the majority of apprentices indicated that in-class training was good to excellent and they were satisfied with their in-school experience.

Looking at the results of the survey and results of discussions with industry representatives, the issues around apprenticeship entry for masonry include the ability and/or desire to:

- ❑ retain workers and offer them a career path;
- ❑ illustrate benefits of certification to a greater proportion of the workforce;
- ❑ access a broader pool of potential entrants, including youth, women, Aboriginal and other minorities; and
- ❑ manage the apprenticeship process to ensure a greater degree of completion.

Overall, there does not seem to be difficulties in providing training opportunities to apprentices. Most are satisfied with the level and competency of training they are receiving. The issues revolve around the weak construction market and decreased market share of masonry work that marked the trade over the past several years, which made it difficult for some apprentices to complete their training. In some provinces, as mentioned earlier, it is not uncommon for apprenticeship training to be suspended due to weak demand. Another issue is that fewer masons are perceiving a benefit to certification, as seen by a decreasing enrollment and in lower proportion of younger masons gaining their certification.

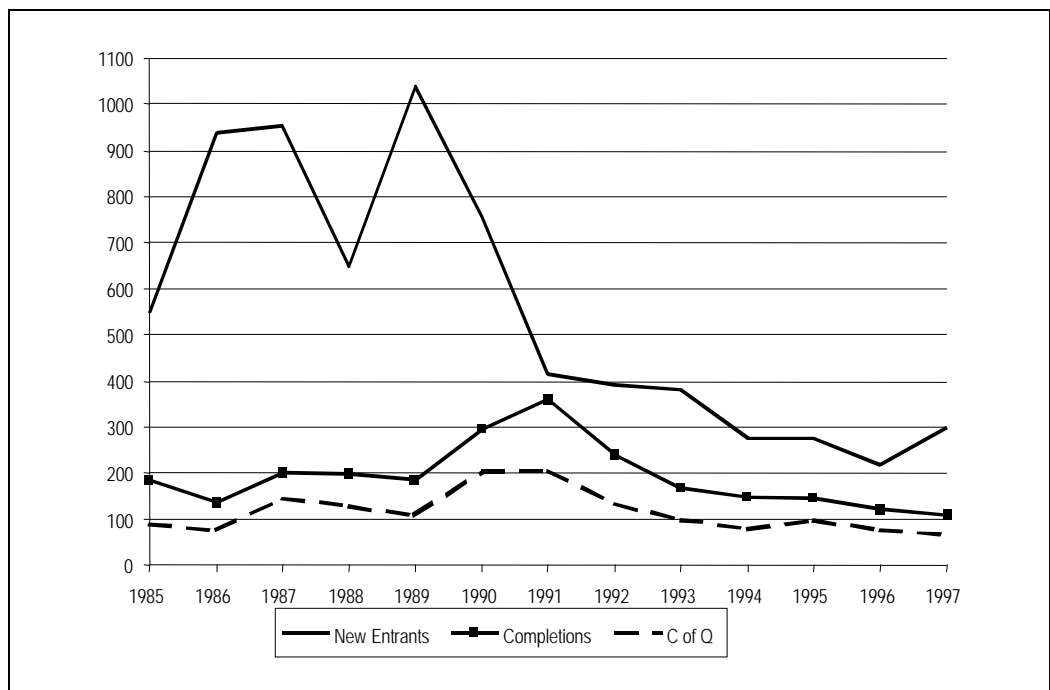
8.7 Apprenticeship Statistics

Apprenticeship training is mandatory in only two jurisdictions for tilesetting, and three jurisdictions for masonry. The lack of regulatory requirements for apprenticeship training helps to explain the low enrollment statistics for the masonry trade.

Masons

Data for the 1990s in Figure 8-5 shows that the total number of new registrants, completions, and Certificates of Qualifications issued has been declining for masons.

Figure 8-5: Apprenticeship Enrollment Data for Masons (1985-1997)



The downward trend for each of the three measures is consistent with the overall pattern of employment in the 1990s. Improving labour market in the late 1990s may encourage increases in registrations.

It is also important to understand the implications of the vertical scale and trend line of the chart — the number of new registrants decreased from over 400 to just over 200 from 1991-1996. The number of completions and Certificates of Qualification remained virtually constant from 1993-1996, at approximately 150 and 100 respectively. The long-term implications are of concern, particularly if the number of certified journeymen leaving the workforce through retirement exceed the number of younger journeymen obtaining their certification.

Figure 8-6 looks at Red Seal statistics for the latest year, 1997 and also shows the total number of Red Seals issued to date.

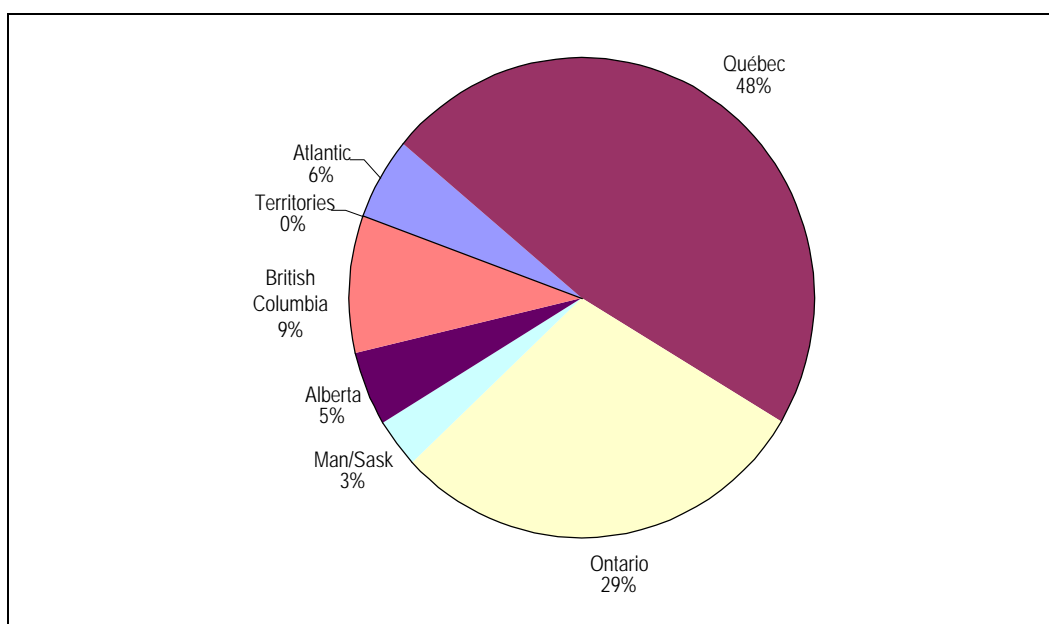
Figure 8-6: Red Seal Statistics

Province	Completed Apprentices			Trade Qualifiers		
	# Issued 1997	Pass Rate % 1997	# Issued To-Date	# Issued 1997	Pass Rate % 1997	# Issued To-Date
NF	1	100	45	2		30
NS	0	0	265	0		14
PEI	0	-	32	0		9
NB	1	100	91	4	44	66
PQ	0	-	0	0		0
ON	17	71	467	5	17	218
MB	0	60	208	0		0
SK	0	100	287	1		25
AB	3	63	815	0		38
BC	13	64	608	2	29	6
NWT	0	-	0	0		0
YT	0	-	0	0		0

The data reflects a low number of Red Seal candidates in 1997, which is consistent with the decrease in the trend toward certification, as discussed in an earlier section.

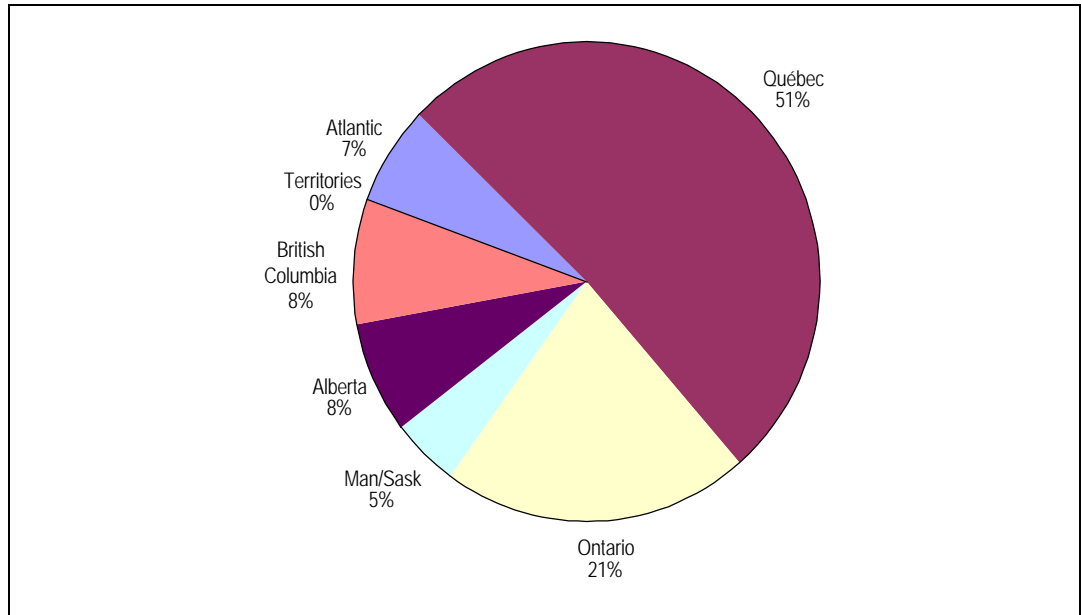
Figures 8-7, 8-8 and 8-9 provide information on jurisdictional breakdown for new registrants, apprenticeship completions, and Certificates of Qualification issued for masons from 1991-1996. The information from these charts shows that Québec has a disproportionately large number of new registrants, completions, and Certificates of Qualification issued, compared to other jurisdictions. This trend is best explained by Québec's system of compulsory apprenticeship that is strictly enforced and policed, but other factors contribute to these results as well. These factors are discussed later in this section.

Figure 8-7: New Bricklayer Registrants (1991-1997)



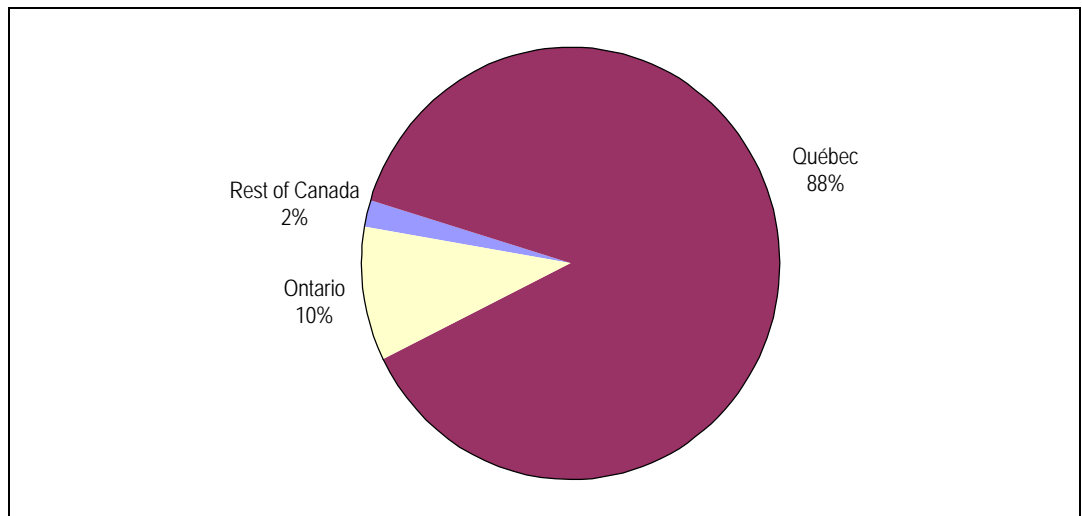
Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-8: Apprenticeship Completions, Masonry (1991-1997)



Source: Statistics Canada, Apprenticeship Enrollment Survey

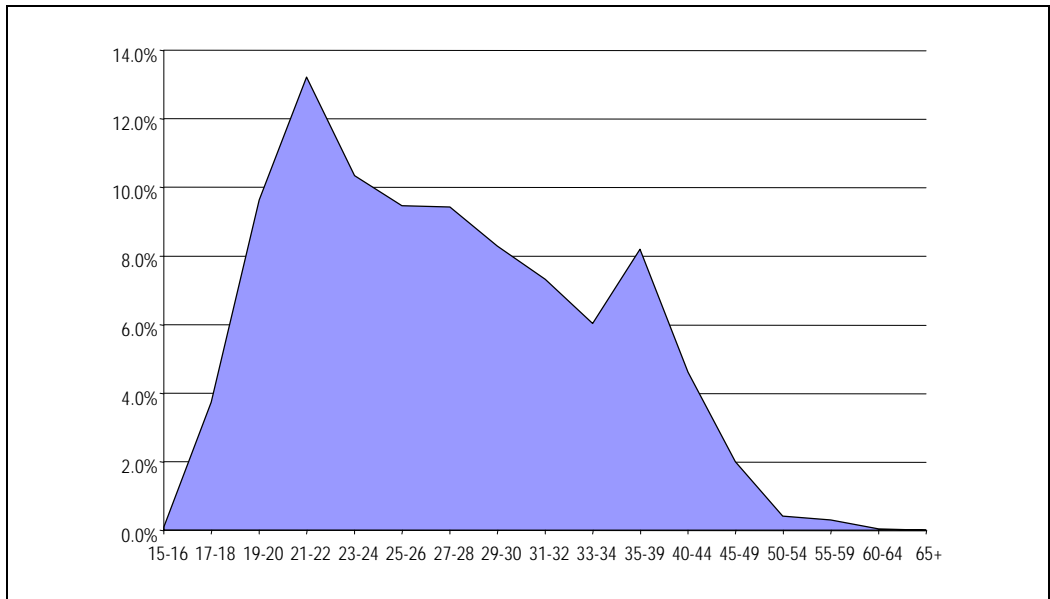
Figure 8-9: Certificates of Qualification Issued, Masonry (1991-1997)



Source: Statistics Canada, Apprenticeship Enrollment Survey

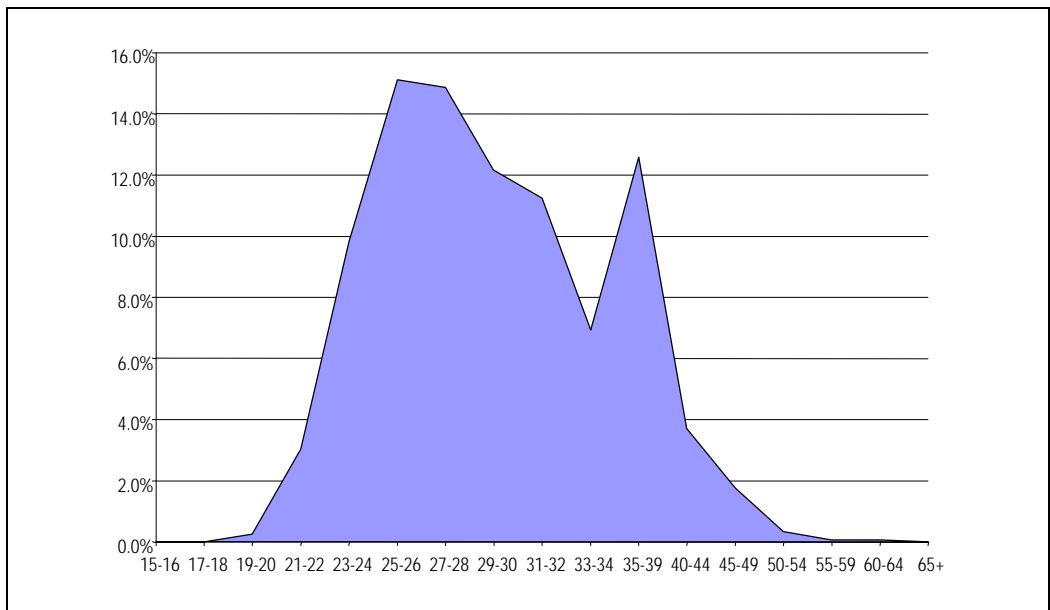
The age distribution of masonry apprentices from 1991-1996 is shown in Figures 8-10, 8-11 and 8-12. (The corresponding figures for tilesetters are found in Figures 8-17, 8-18 and 8-19.) These results are a dramatic extension of findings in other trades showing that workers enter apprenticeship after many years in the workforce. This clearly indicates that apprenticeship is not a “school to work” transition program. Efforts to shift apprenticeship to this role will require a major change in behaviour in masonry and other trades. The age of completion graph (Figure 8-11) also confirms the discouraging results that apprenticeship spans many more years than implied by work requirements. Delays in completion are likely due to weak markets and limited course offerings. Improving conditions may reduce the elapsed time required to complete. Certainly these findings suggest a challenge in attracting young people to the trade.

Figure 8-10: Age Breakdown of New Entrants, Masonry (1991-1996)



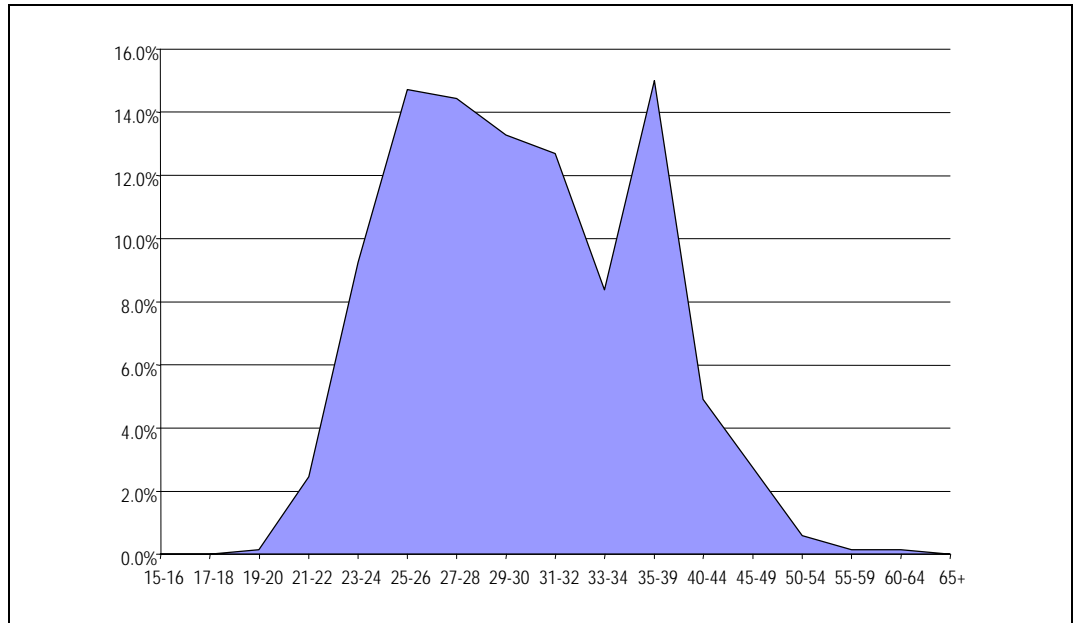
Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-11: Age Breakdown, Completions, Masonry (1991-1996)



Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-12: Age Breakdown, Certificates of Qualification Issued Masonry (1991-1996)



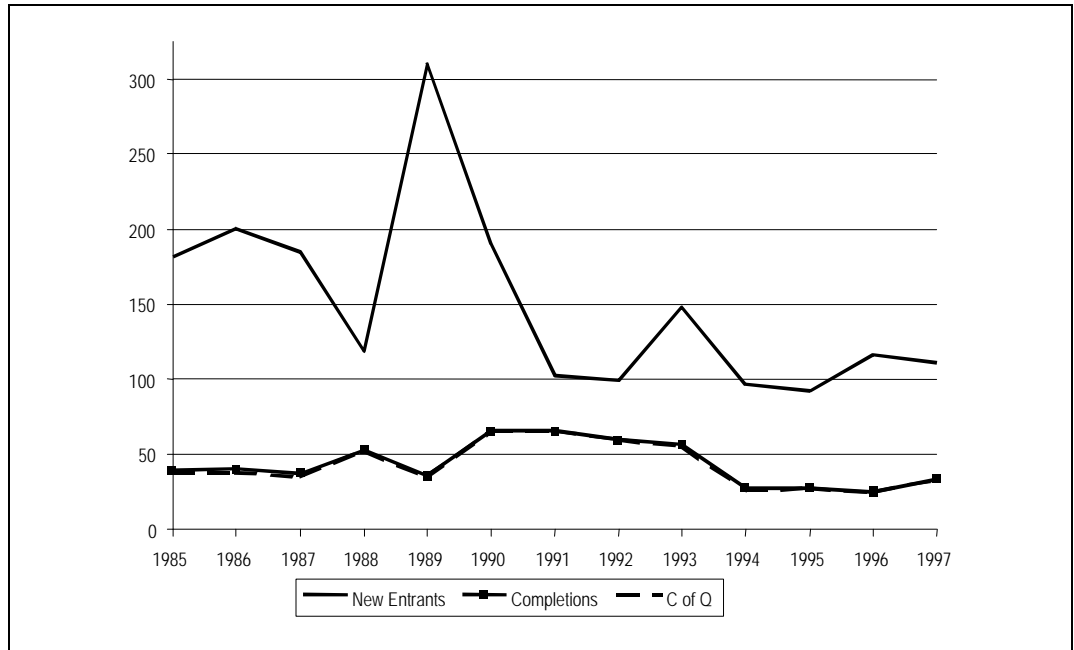
Source: Statistics Canada, Apprenticeship Enrollment Survey

Tilesetters

The tilesetter trade is seen here attracting a small, but steady core of 100 or so workers. Given the size of the workforce, the variations reported are not likely significant indicators of changing conditions. Indeed, the number of registrations held up through the recession. The decline in completions and C of Q's is almost certainly due to the loss of work during the recession.

The absolute number of new entrants, completions, and Certificates of Qualification issued (see Figure 8-13), raise a concern that the group of newly certified journeypersons will not be sufficient to replace the journeypersons that will be retiring in the near future.

Figure 8-13: Apprenticeship Enrollment Data for Tilesetters (1985-1997)

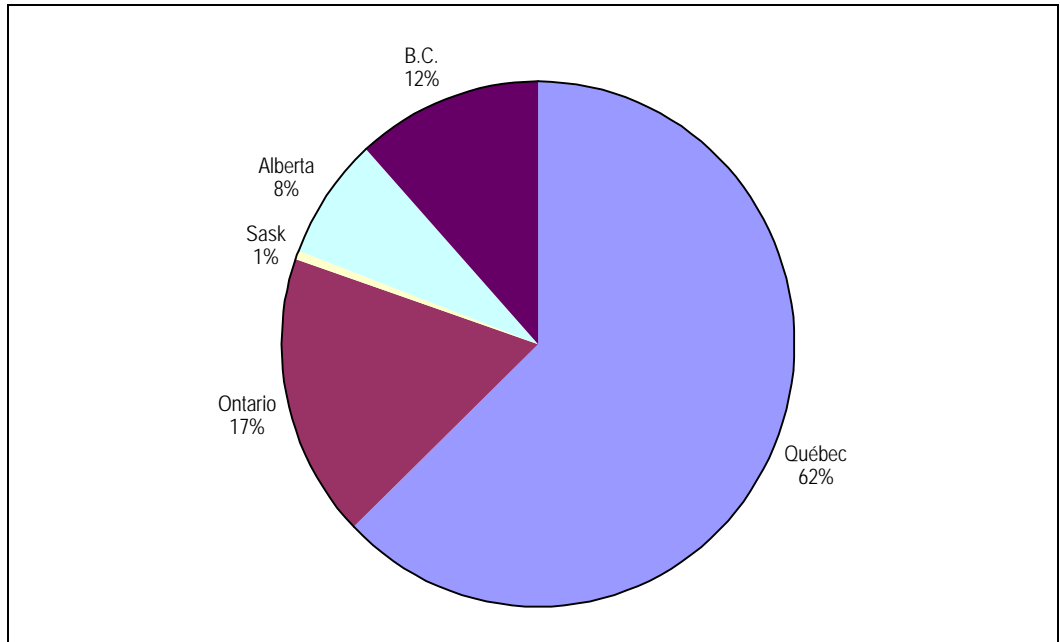


Source: Statistics Canada, Apprenticeship Enrollment Survey

On average, from 1991-1996, the jurisdictional breakdown of apprentice completions (see Figures 8-14, 8-15 and 8-16) for tilesetters shows a similar pattern to masons — again, there is disproportionately more apprenticeship activity in tilesetting in Québec compared to the other jurisdictions in Canada. These results reflect the influence of mandatory apprenticeship. For example, tilesetting is a compulsory trade in Québec, but it is a voluntary trade in Ontario. Thus, the number of completions and Certificates of Qualification are quite high for Québec, but are negligible for Ontario.

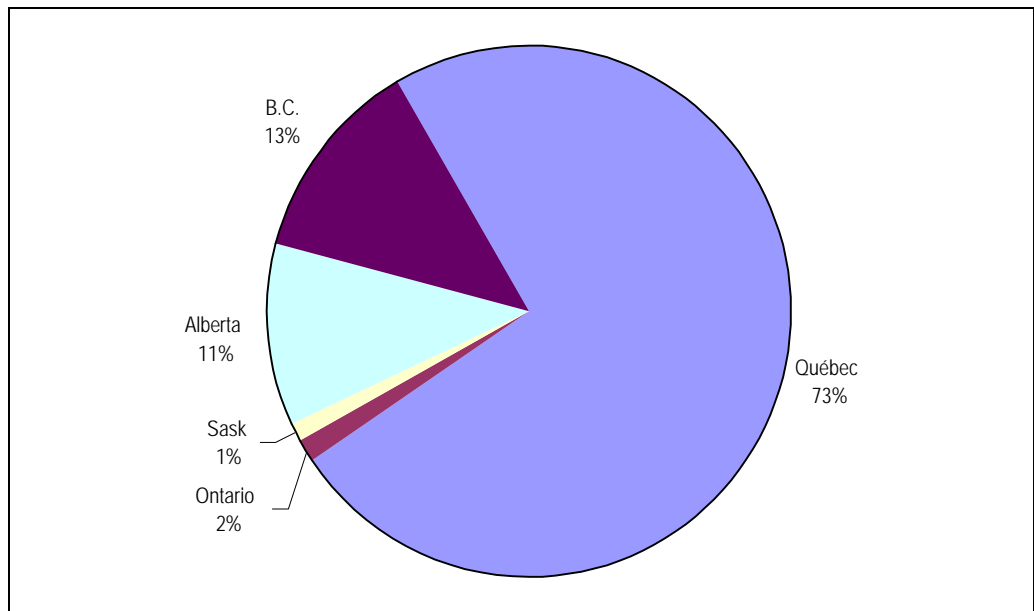
These results also reflect the influence of availability of training. Only Québec, Ontario, and British Columbia have tilesetting apprenticeship programs in place. Tilesetters from Alberta (whose tilesetting apprenticeship is currently suspended due to lack of demand) and Saskatchewan take their training in British Columbia. It is not surprising, then, that apprenticeship activity in tilesetting is limited to a small number of jurisdictions.

Figure 8-14: New Tilesetter Registrants (1991-1996)



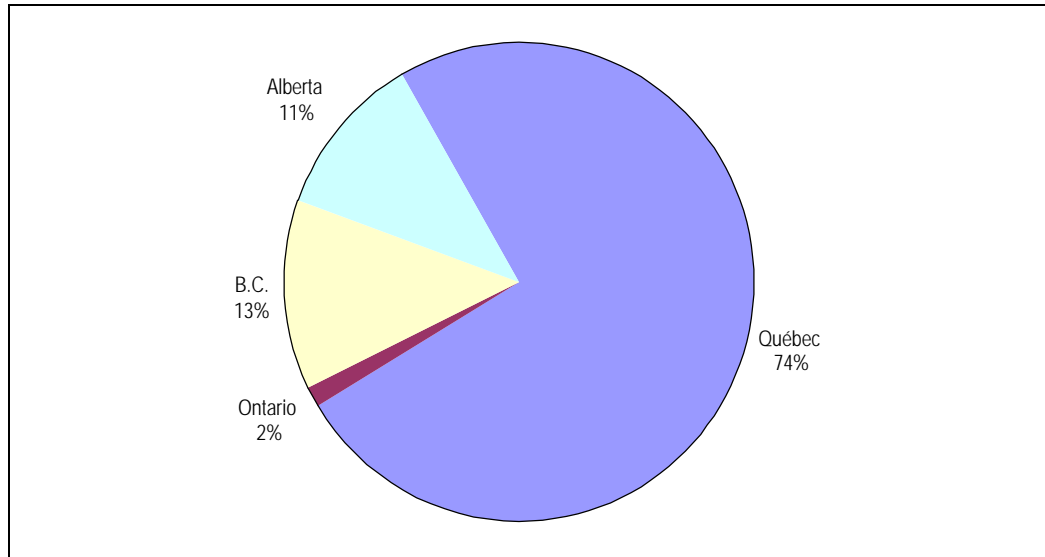
Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-15: Completions, Tilessetting (1991-1996)



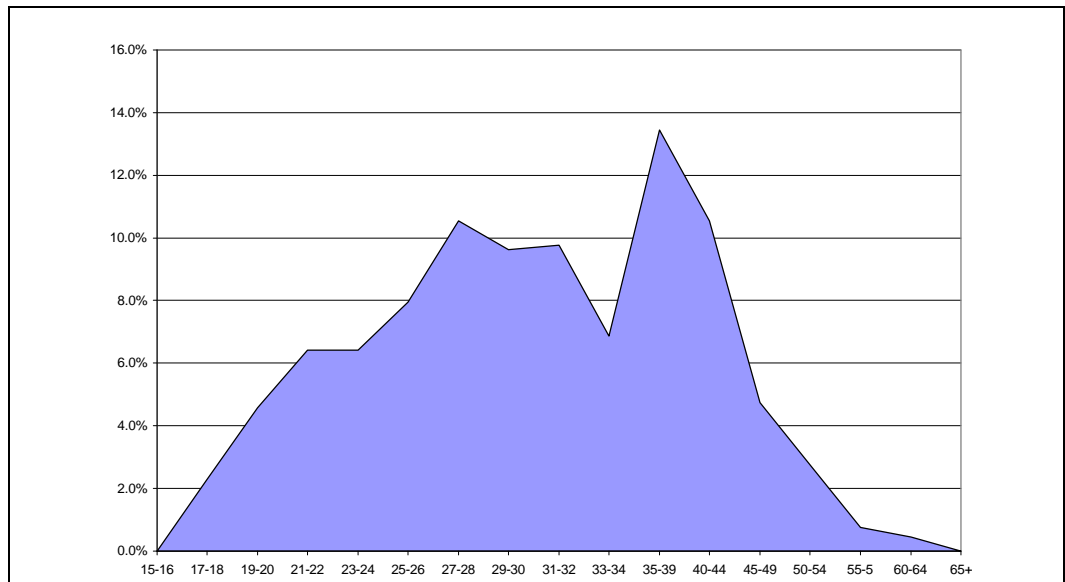
Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-16: Certificates of Qualification Issued, Tiling (1991-1996)



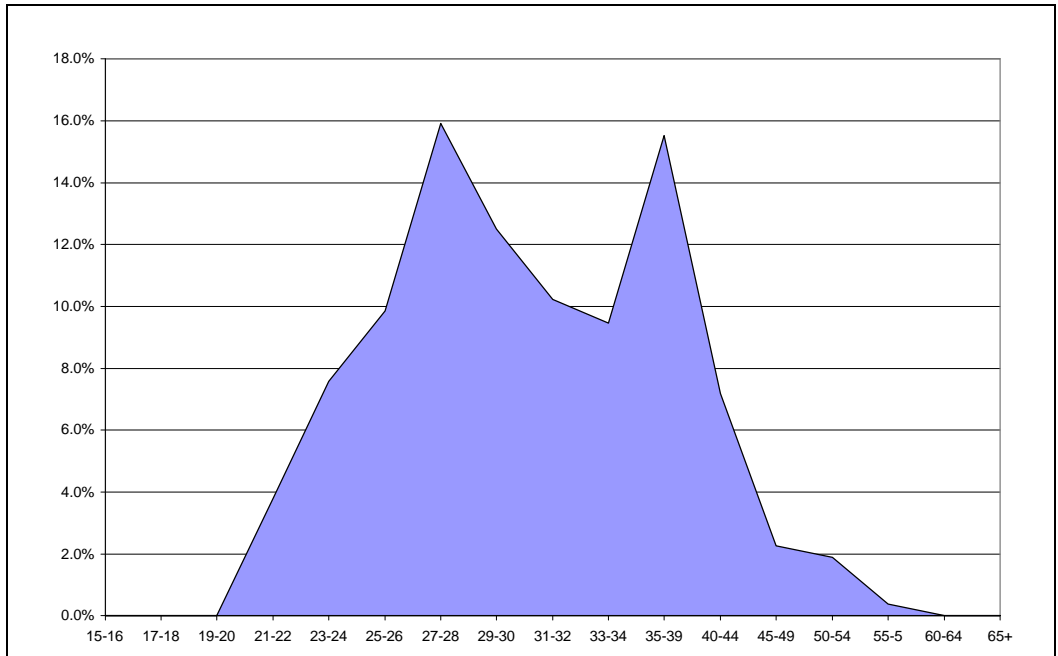
Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-17: Age Breakdown, New Tiler Apprentices (1991-1996)



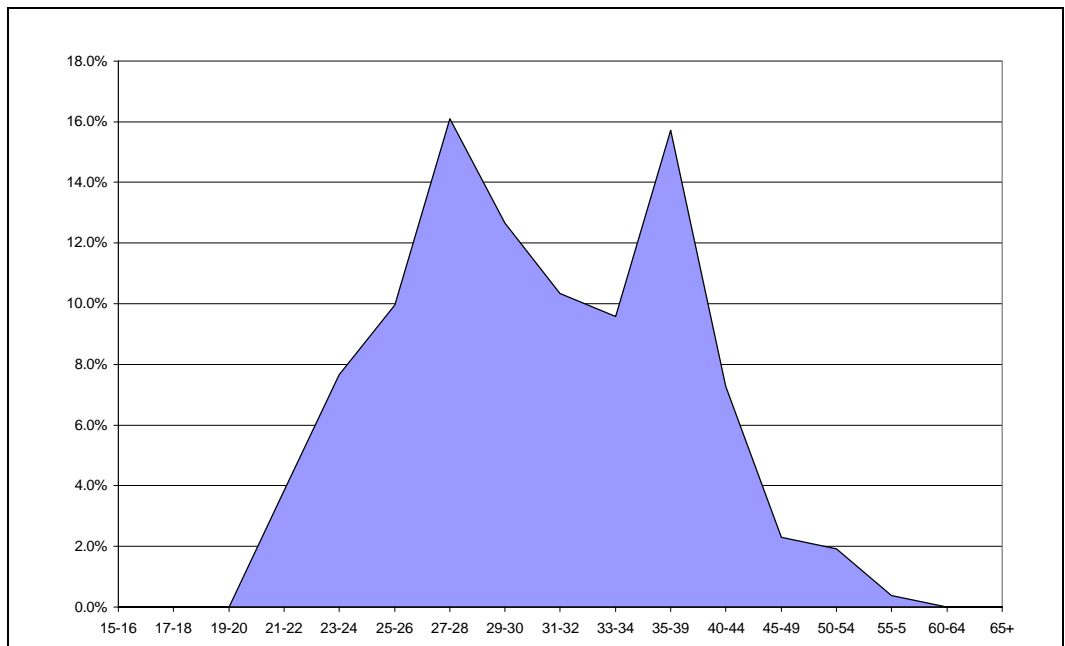
Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-18: Age Breakdown, Tiling Completions (1991-1996)



Source: Statistics Canada, Apprenticeship Enrollment Survey

Figure 8-19: Age Breakdown, Tiling Certificates of Qualification (1991-1996)



Source: Statistics Canada, Apprenticeship Enrollment Survey

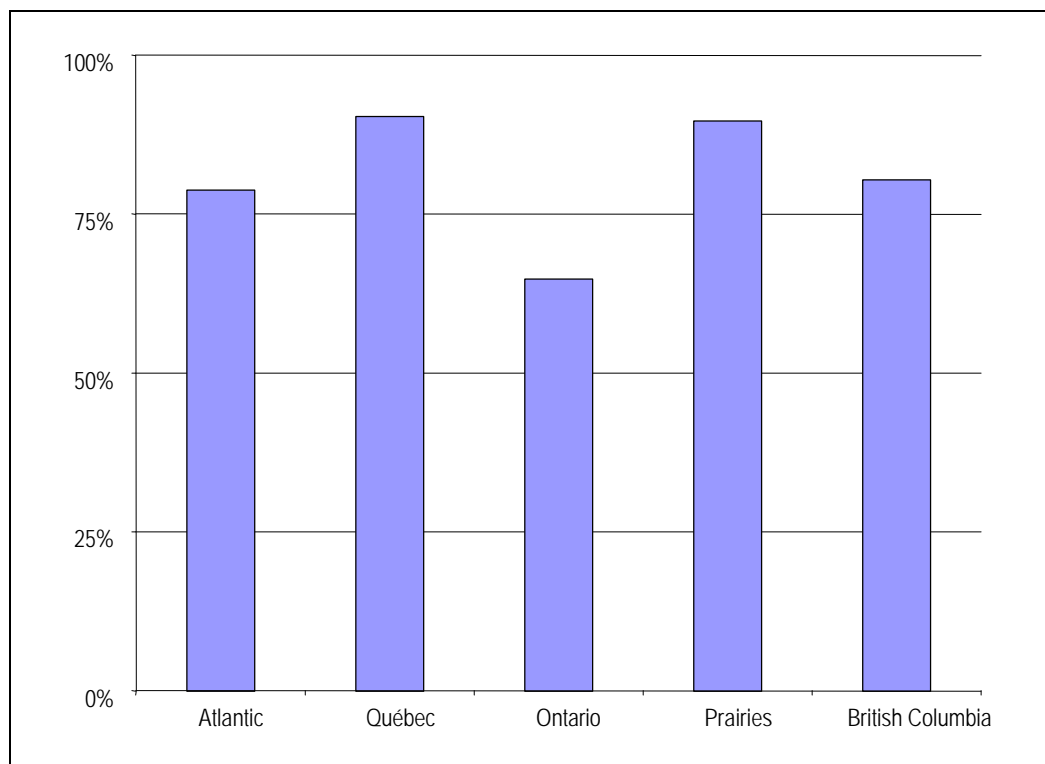
Factors Influencing Training and Apprenticeship

Characteristics of the Trade. The degree to which a trade can be learned on-the-job, rather than through formal training, depends on the complexity of the tasks performed and the level of theoretical background needed to understand the work. This is one of the reasons why some trades, such as plumbing, are more heavily regulated than others.

The consensus seems to be that much of the masonry trade can be learned on the job. However, workers, contractors, and trainers all agree that some activities, such as refractory masonry, stone cutting, terrazzo, and blueprint reading require specialized instruction that is not always available or adequately taught on the job site. Evidence from the national survey supports this conclusion.

According to workers' survey results, over three-quarters of masons and stone masons have completed an apprenticeship (69%) or are in the process of completing an apprenticeship (10%). This is a surprisingly high number of workers when one considers that certification is voluntary in most jurisdictions. Figure 8-20 shows that there is some regional variation in these results. Over 75% of respondents from all regions except Ontario have completed, or are currently completing apprenticeships.

Figure 8-20: Apprenticeship Status by Region



These results are likely not representative of national trends due to the heavy reliance on union members and larger contractors in the sample. Survey results can often be validated in Québec where alternative statistics from the CCQ are available. In this case, it is not surprising that Québec reports the largest proportion of certified or apprentice workers as the trade is compulsory there. Indeed, the 10-15% portion of the Québec sample who are not apprenticed or qualified are likely masons tenders.

Respondents were asked to evaluate different aspects of their training experience, including trade school training, on-the-job training, length of apprenticeship, and overall skill coverage. In addition, respondents were asked to evaluate the availability of upgrade training.

Figure 8-21 shows that on-the-job training is more highly valued than the in-school portion of apprenticeship training. This is likely because apprentices are less fond of classroom or training environments and prefer to be on the job site, where they can apply techniques they've learned (as well as earn an income). The overall length of their apprenticeships was not a great concern to the respondents (see Figure 8-22), but nearly half of the respondents indicated that their apprenticeships did not fully prepare them for the type of work that they would be performing after completing their apprenticeships (see Figure 8-23).

Furthermore, nearly half of the respondents indicated that opportunities to acquire upgrade training in their area were poor (see Figure 8-24). A perceived lack of high-quality and accessible upgrade training suggest that masons and stone masons may be forced to rely on on-the-job training for supplementing their trade-related skills.

Figure 8-21: Trade School Rating vs. On-the-job Rating

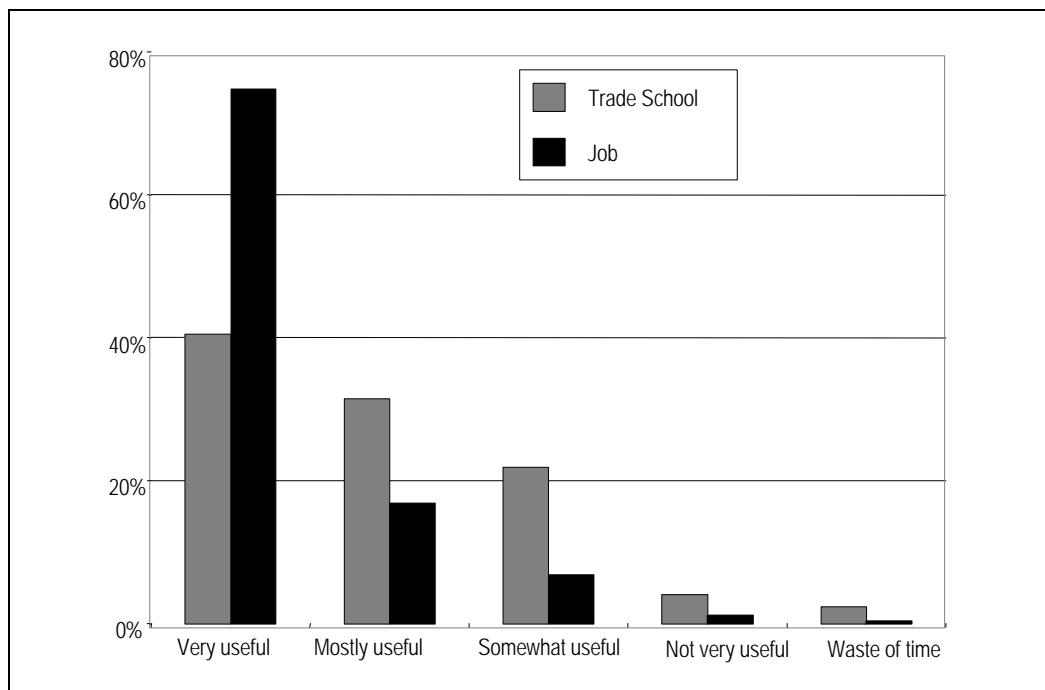


Figure 8-22: Length of Apprenticeship

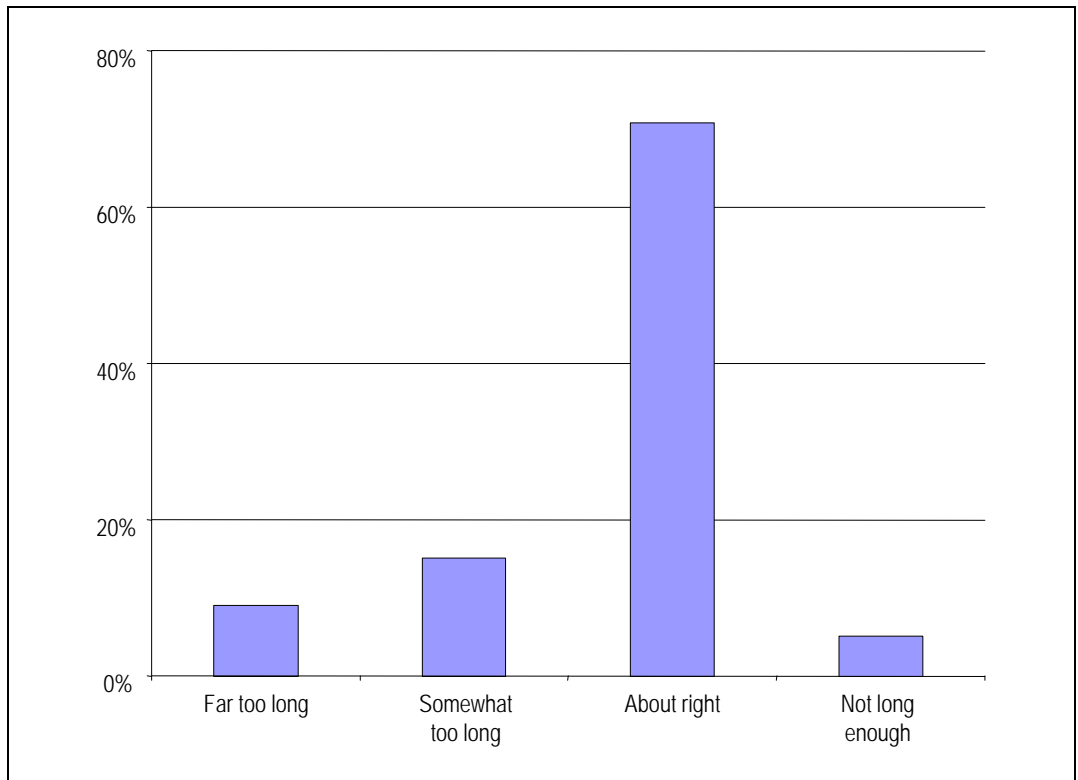


Figure 8-23: Rating of Skill Coverage

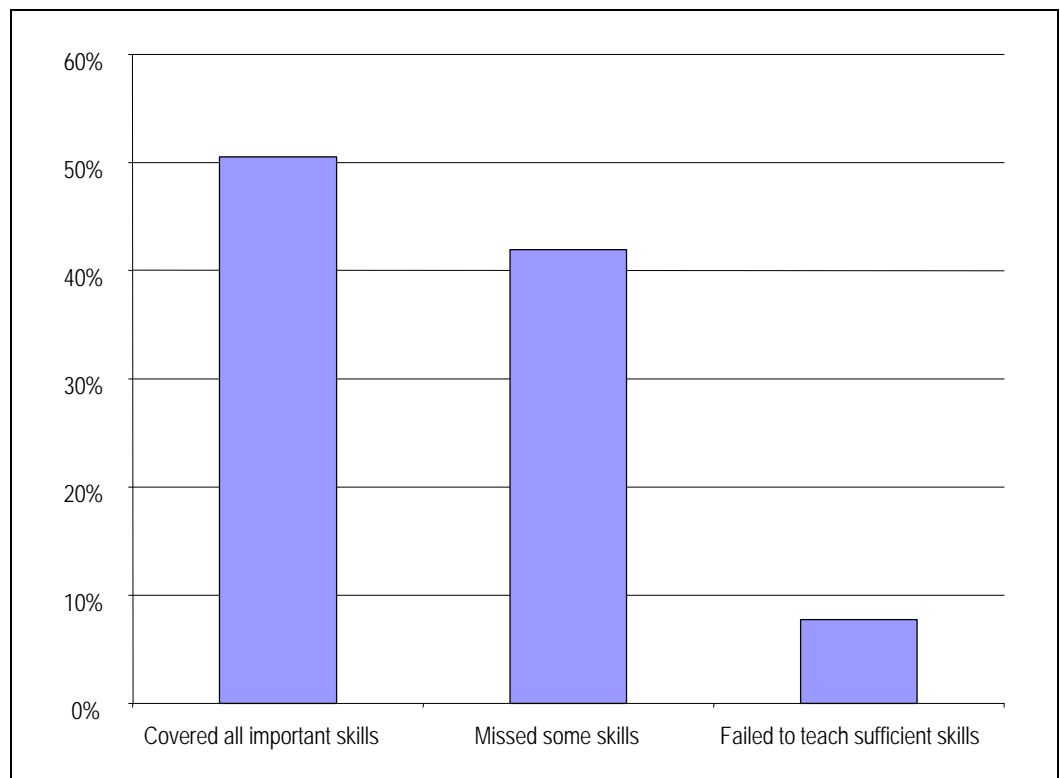
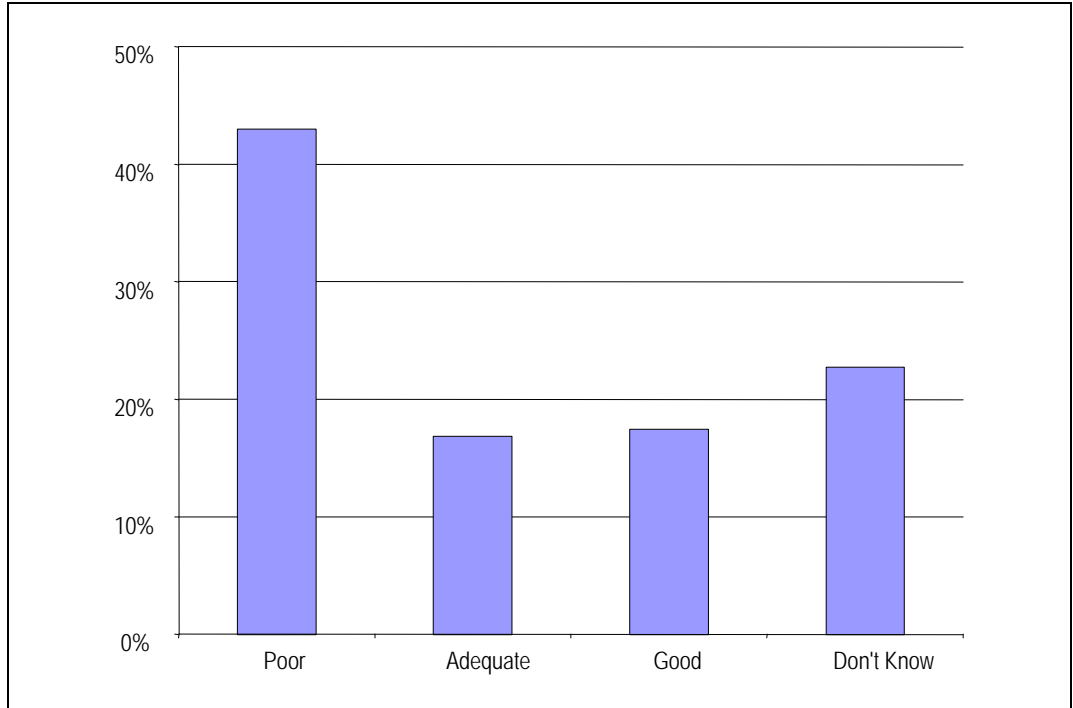


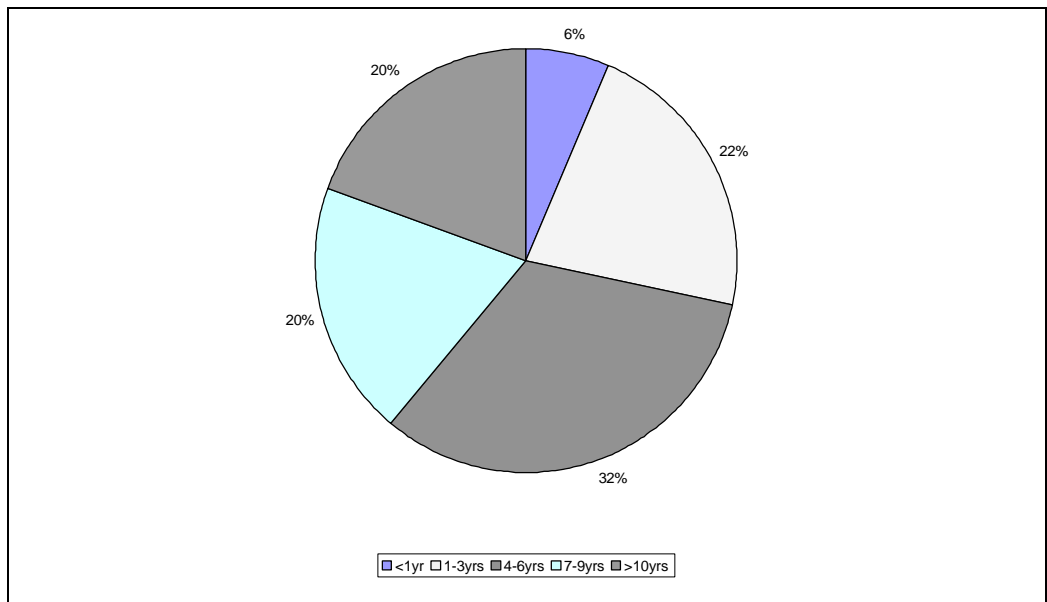
Figure 8-24: Rating of Training Opportunities



8.8 Results from the National Apprenticeship Survey

The National Apprenticeship Survey focused on respondents who were, at the time of the survey (1996), out of apprenticeship for 2-3 years. The data reflects the more current experience of apprentices, compared to the workers' survey that presents data from those who have been through apprenticeship training at some point in their career. The following information is based on the results of the National Apprenticeship Survey for masons.

Figure 8-25: Bricklayer — Number of Years out of Highschool



There is a significant amount of discussion, in all trades, regarding how to attract younger people at apprenticeship. Figure 8-25 illustrates the number of years spent out of high school, before entering a bricklayer apprenticeship. Forty percent of the respondents took more than seven years between leaving high school and entering apprenticeship.

Figure 8-26: Highest Level Schooling Achieved

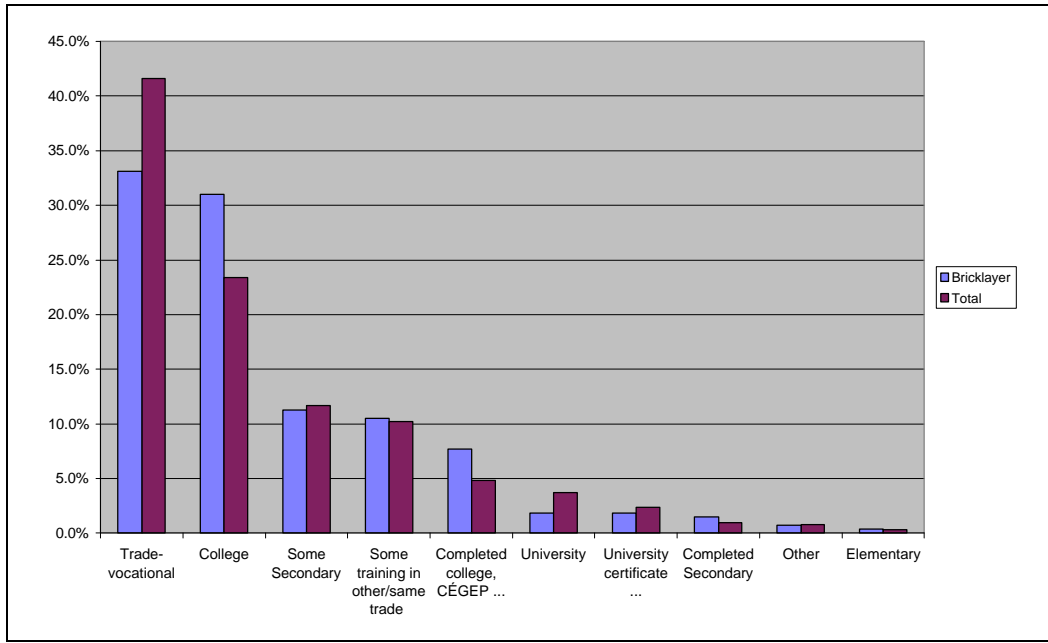
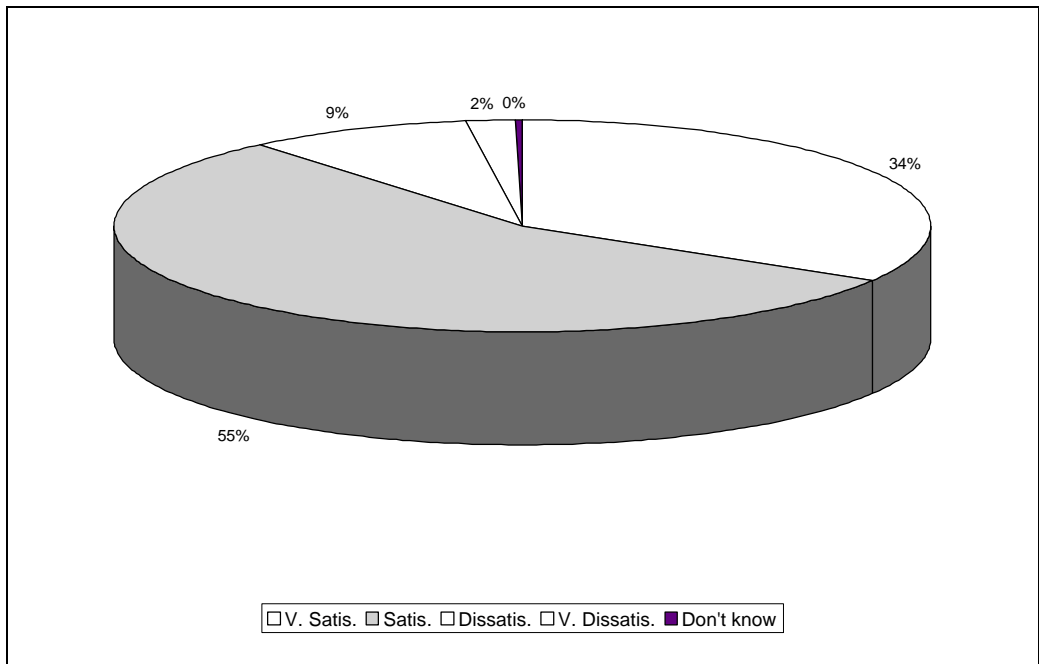


Figure 8-26 compares the level of schooling achieved by a bricklayer compared to an aggregate of six other major trades.

Figure 8-27: Satisfaction with Sponsoring Employers/Organization



In Figure 8-27, 89% of respondents were “satisfied” or “very satisfied” with the attitude of the sponsoring employer or organization. When asked how satisfied they were with the attitude of government consultants, 71% were “very satisfied” or “satisfied”, while nearly 20% were “dissatisfied” to “very dissatisfied” (Figure 8-28).

Figure 8-28: Satisfaction with Government Apprenticeship Consultant

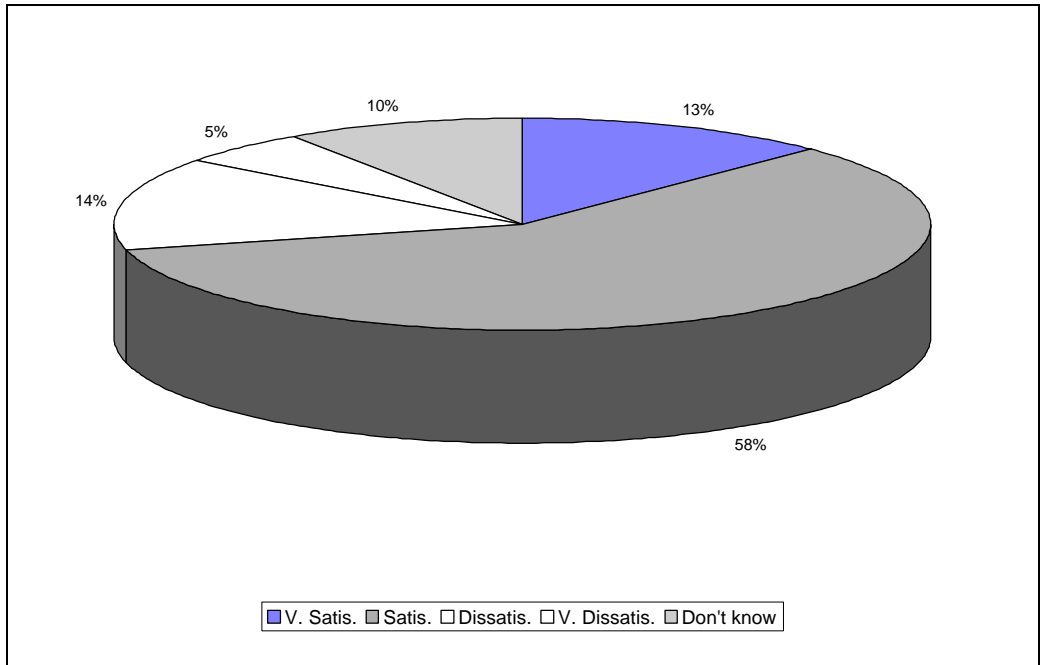
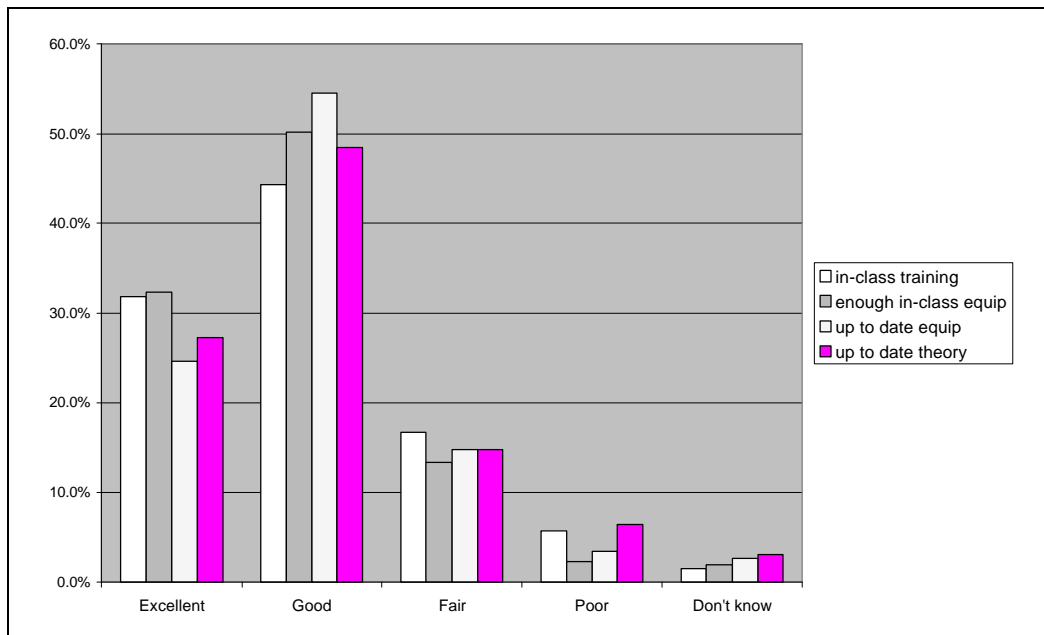


Figure 8-29: Rating of In-class Training

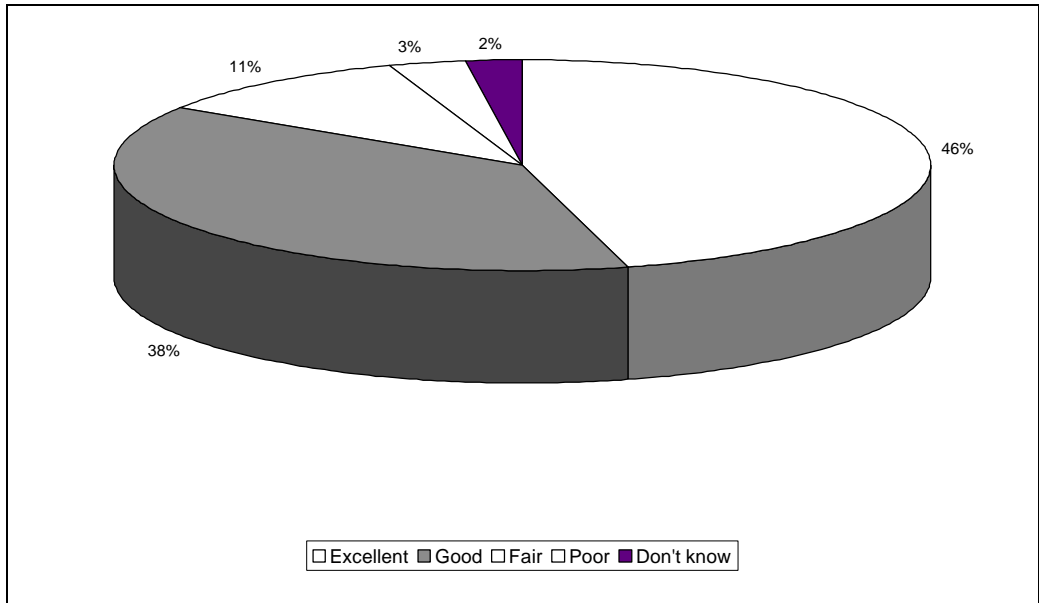


In-class training was rated on the following aspects (Figure 8-29):

- ❑ covering material related to the trade;
- ❑ providing enough in-class equipment to practice the skills that were taught;
- ❑ providing up-to-date equipment; and
- ❑ teaching up-to-date techniques and theory.

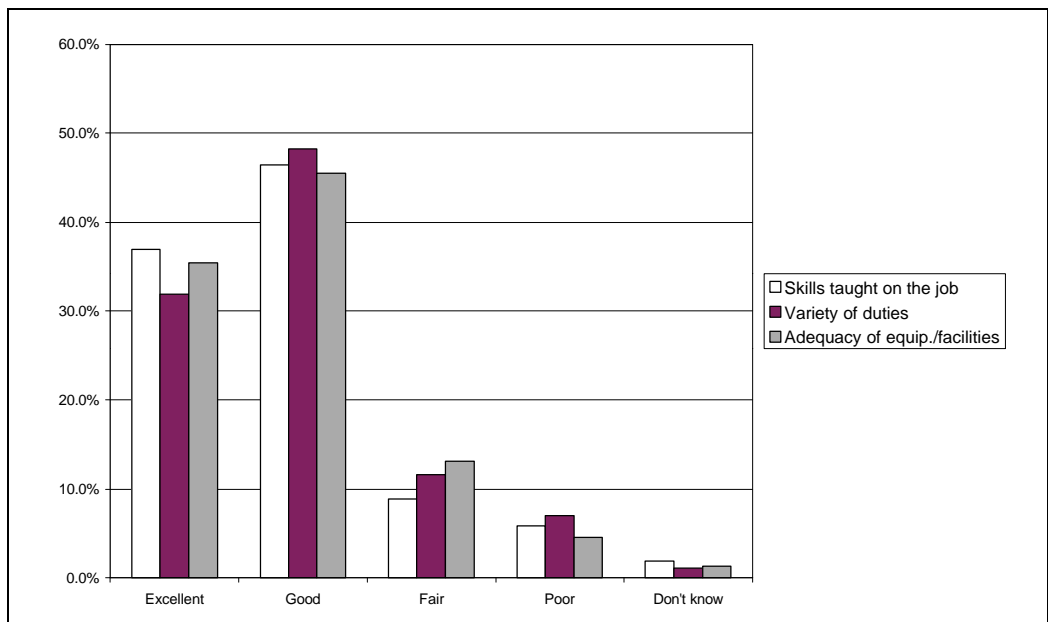
Overall, a high proportion rated in-class training as “good” or “excellent” based on the above parameters.

Figure 8-30: Knowledge/Proficiency of Teachers



The majority indicated that the knowledge and proficiency of their teachers were “good” to “excellent” (Figure 8-30).

Figure 8-31: Rating On-the-job Training



Respondents were also asked to rate their on-the-job training experience on the following aspects (Figure 8-31):

- skills taught during on-the-job training related to the basic requirements of the trade;
- variety of duties given during on-the-job training related to the trade; and
- adequacy of equipment and facilities provided during on-the-job training.

Overall, the majority rated their on-the-job training experience as “good” or “excellent”.

Figure 8-32: Perception of On-the-job Training

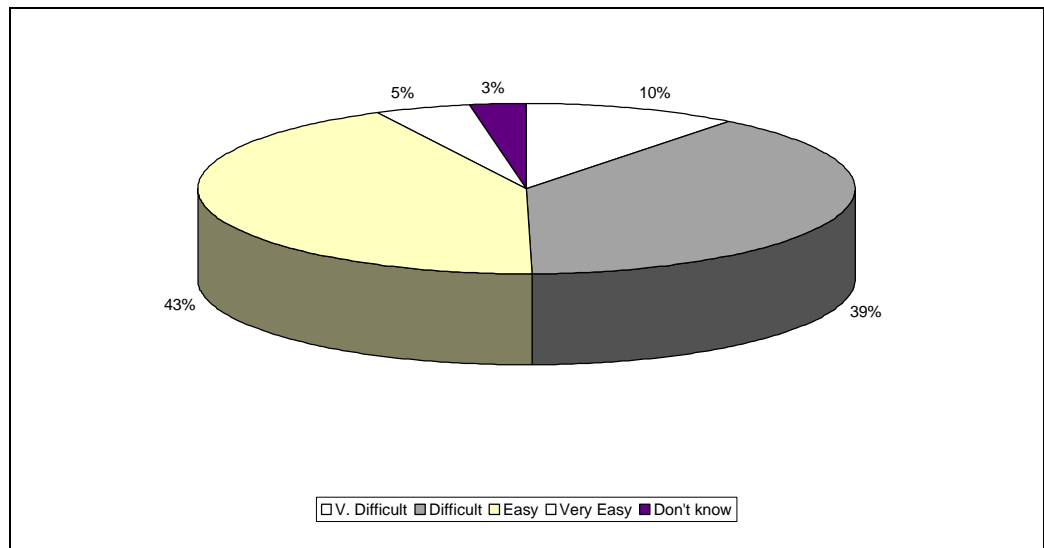
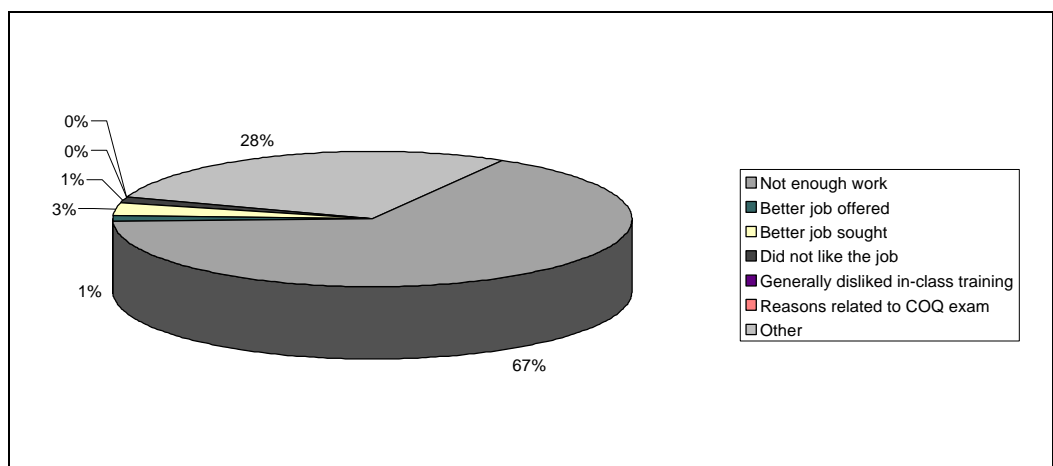


Figure 8-32 illustrates that there is a fairly even split between those who perceived on-the-job training as easy and those that perceived it as difficult. Forty-nine percent of respondents indicated that on-the-job training was “difficult” to “very difficult”, while 48% perceived it as “easy” to “very easy”.

Figure 8-33: Main Reason for Not Completing Apprenticeship



The number one reason for not completing an apprenticeship was “not enough work”. This was indicated by over two-thirds of the bricklayer apprentices (Figure 8-33).

Figure 8-34: In Last 2,000 Hours — Number of Times Unemployed

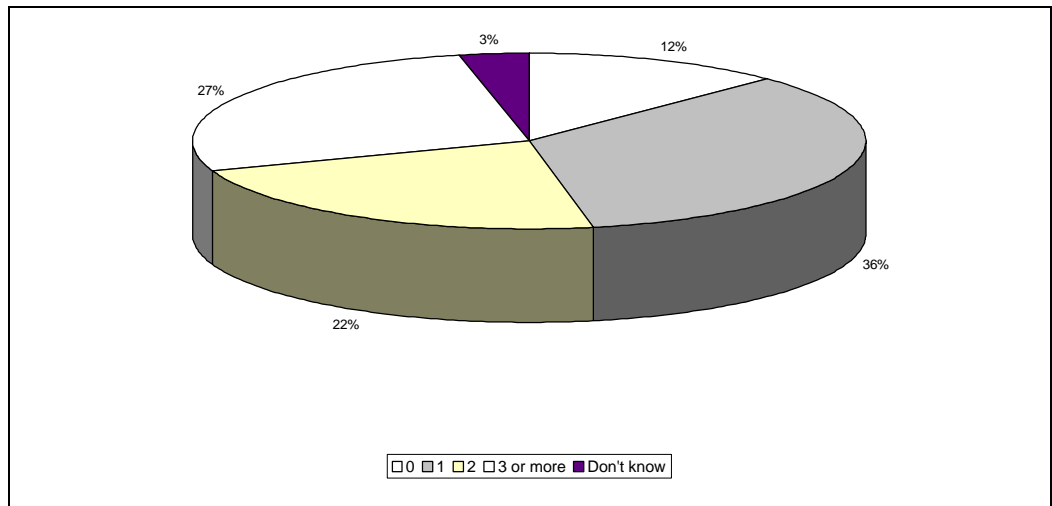


Figure 8-34 shows the number of times an apprentice has been unemployed in his last 2,000 hours and nearly half had been unemployed two or more time during that timeframe.

8.9 Summary

To summarize, several factors (shown in Figure 8-35) have discouraged widespread training in the masonry trade in Canada. This is resulting in low apprenticeship registrations and few opportunities for training.

Figure 8-35: Summary for the Masonry Trade

Factor	Comments
Characteristics of the Trade	With the possible exception of specialized activities, much of the masonry trade can be learned on-the-job.
Regulatory Requirements for Training	With the exception of health and safety training and compulsory trade designations in a small number of jurisdictions, there is little regulatory requirement for training.
Industry Demand for Increased Skills	There does not appear to be overwhelming evidence of consistent skills gaps (possible exceptions are refractory brick and terrazzo).
Industry Demand for Increased Workers	Various trends suggest that there will be a shortage of skilled masonry workers in the near future; if appropriate steps are not taken.
Technological Change	The nature and pace of technological change is such that it can be accommodated through on-the-job or manufacturer/supplier training as needed.
Barriers to Accessing Training	There are considerable motivational, economical, and other barriers for workers to undergo training — there is either no perceived need to train, it is not economically worthwhile to forego time or expense to attend training, or training is not available when an interest is there.
Sources of Funding for Training	Training providers are being much more selective in the content and scheduling of training, particularly given the availability of training funds.

A distillation of all of these factors taken together seem to suggest two imperatives for training and apprenticeship:

- There must be an incentive to take training, a desire or willingness for a better skilled workforce. This incentive must be mutual on the part of the individual worker, employers, the industry as a whole, and government. If there is a lack of commitment from any of these stakeholders, a vibrant training system will be difficult to achieve or maintain.
- Training opportunities must be available to those wishing to undertake training.

9. Conclusion and Recommendations

This section presents general conclusions drawn from the findings of the report. These findings form the basis for a series of recommendations that will be implemented by a new industry group.

9.1 Conclusions

Markets for masonry products face significant challenges from alternative materials and systems. The age structure of the trade indicates that a relatively large number of workers will leave the trade during the next ten to twenty years. To meet these shifting conditions, the industry will need to rebuild the apprenticeship system and improve the use of standards and certification. Attracting new entrants will be a challenge. The top priority will be improvements in flexibility and mobility of the workforce among provinces, employers, markets and areas of work.

These findings and the following recommendations have been validated by industry and provincial groups and will be the basis for national initiatives. A crucial component of the implementation plan will be to seek to gain further support from industry groups and each province for specific changes in labour market support systems. The Committee recognizes that the authority and jurisdiction to manage most of these systems rests with these other groups. To effect change in the current situation, the onus is on the national group to prove the merit of its recommendations and to convince the industry, province or training institutions to change the existing situation.

9.2 Recommendations

It is proposed that a new group, referred to as the “Canadian Masonry Human Resources Council” (CMHRC) for the purpose of this report, be created to facilitate the implementation of the findings and recommendations reported here. The CMHRC would likely include representatives from labour, contractors, manufacturers, distributors, designers and trainers, both organized and independent. The name, mandate, composition, governance, funding, priorities and other details for this group will be determined by the new members of the CMHRC in the first stages of its creation. Membership of the CMHRC will be determined in cooperation with industry, labour, Human Resources Development Canada and the Canadian Council of Directors of Apprenticeship. It is incumbent on the CMHRC to find industry-based funding for its work. Based on the findings in this report, the CMHRC will set goals and establish activities in eight areas. These areas are set out in this section and are linked to the findings from earlier in this report. Each recommendation is intended as the first step to solve industry problems. Industry stakeholders must take leadership roles in driving the implementation process.

Recommendation: Recapture Masonry Market Share

Evidence from several sources indicates that the share of brick, block, stone and other traditional masonry products is being lost to other products in new construction. This report cites the decline and weak recovery in employment by masons and the declining shipments of masonry products relative to overall construction. There is also evidence that restoration and renovation work is only a small component of work in the study sample, while market information suggests that this is a large, relatively stable and growing market for masonry. A general initiative targeting a gain in market share is recommended with particular emphasis on the repair, restoration and renovation segment.

For this initiative to succeed, it must include designers (architects, engineers, interior designers) who now receive too little training in masonry products. Evidence cited here shows that masonry products are under-represented in training programs and this must be improved.

See Sections 2.4, 2.5, 2.6, 3.1, 7.3 and 7.4 for more information on the loss of market share. Section 2.2 refers to a recent study of the extent of material-specific training in Canadian architecture and engineering schools.

Recommendation: Strengthen Management Skills (Business Acumen) of Contractors

Low margins, bankruptcy, the underground economy and new regulations and technology all challenge the capacity of masonry contractors. Suppliers do not offer adequate support and competitors with new products and systems are backed by strong industry promotion and guarantees.

Masonry contractors must find new skills and systems that will raise the quality and the image of their products. In particular, bidding, accounting, marketing and planning systems must improve and new standards are needed to prevent inexperienced entrants from undercutting realistic bids and weakening efforts by other to rebuild the industry's image.

Section 2 documents challenging market conditions and Section 7 records the loss of markets. Contractors comment in Section 6 on the impact of industry fragmentation.

Recommendation: Improve Health and Safety Practices within the Industry

Masonry workers and employers face special challenges in the area of health and safety. In most provinces WCB assessment rates are among the highest for masonry. The study survey showed that less than half of masons have necessary training in areas like first aid and working on scaffolding. Improving the extent of health and safety is a priority for the new CMHRC. Particular focus is needed on new entrants — especially those entering outside of apprenticeship — as well as independent operators or mason tenders.

See Section 5.1 for results on health and safety training in the study sample. Contractor's comments on health and safety are in Section 6.

Recommendation: Improve and Expand Apprenticeship Training

There are important benefits for workers, employers, owners and the public when certified workers install masonry products. For example, safety training and records are superior, a greater breadth of work experience offers certified workers higher income, and masons have more depth of skill in core areas like walls and foundations. Apprenticeship is the best system for certifying workers and the evidence shows that workers and employers are generally satisfied with this model. However, improvements are essential (such as a renewed focus on refractory work) and many new apprentices will need to be recruited in the next decade.

The Red Seal program is an essential part of the current system and it must be expanded as too few masonry workers are now qualified. Enhancing national training standards is needed because of the widely varying apprenticeship programs among provinces. One potential solution here is a core curriculum for the masonry trades. The CMHRC will be structured to be effective in the role of promoting national initiatives and working with government to improve training standards.

A general description of certification in the trades is found in Section 2.1 and results on the impact of certification are reported in Sections 4 and 5. Contractors comment on certification in Section 6.6. Data on the extent of certification is included in Section 8.

Recommendation: Maintain Size of Workforce by Balancing Entry and Exit to and from the Trade, to Meet Projected Market Demands

The age structure of the entire trade, but in particular of unionized and certified workers, shows that large numbers of skilled workers will exit through retirement during the next twenty years. Replacing this group will require special attention to attracting new entrants. However, this process is complicated by dramatic cycles that create massive unemployment, followed by surging demand and shortages. New and more intense efforts are required to monitor the trades and attract new entrants so that both long-term trends and short-term cycles are balanced in the plans for intakes. A target of increasing the number of certified masonry workers must guide the planning. Immigration should be viewed as an important tool for managing the labour market and encouraged by the CMHRC when appropriate. Likewise, recruiting from non-traditional groups such as women and Aboriginal people should be included in supply management strategies.

Demographic projections are included in Section 3.2 and contractors' comments on labour demand are found in Section 6.5. Recent research on women and Aboriginal people in the trades is reported in Section 8.5. Data on apprentice entry, withdrawal and completion is included in Section 8.7

Recommendation: Improve Relations (Communication) with CCDA and PAC/TACs

Contractors report that the relations between the industry and governments — in particular training institutions — need improving. Strong communications will be essential to implement recommendations noted above in areas such as core curriculum. The CMHRC must improve the industry's relationship with the Canadian Council of Directors of Apprenticeship (CCDA) and provincial PAC/TACs. In particular, the CMHRC should accumulate and maintain a complete inventory of masonry training opportunities in Canada to provide an accurate and comprehensive reference source for improving training in the trade.

Contractor comments are in Section 6.7 and a general description of apprenticeship training is found in Section 8.

Recommendation: Improve Work and Career Opportunities Available to the Workforce

Workers and contractors in the masonry trades face significant financial and other work-related risks. Profit margins are low, unemployment is high and competition is intense. Even with the improving construction environment, opportunities are limited. However, better management of the workforce can improve the situation. Mobility among employers, among work areas and between provinces can allow both contractors and workers new opportunities. These broader horizons can smooth out risks during cycles and add needed jobs and incomes.

The key here is training. Upgrade training will add depth and breadth to a worker's career. In particular, masonry journeymen are traditional candidates for promotion to supervisor and management positions. Demographics and changing technology are threatening these opportunities. Also, the CMHRC recognizes that there are special needs to upgrade the workforce in refractory, renovation and restoration work.

Risks and challenges are documented in Section 2. Contractors regard the pending shortage of forepersons and supervisors as a priority issue (see Section 6.5.)

Recommendation: Improve Labour Market Planning

The need for trained masonry workers will likely fluctuate between dramatic peaks and troughs. Planning to sustain the quality and quantity of the workforce will be a major challenge. Continuous monitoring and regular projections are essential. But even the best planning will often fail to anticipate events. Flexibility in management plans and mobility among the workers are key features of an effective human resource planning strategy. It is further proposed that masonry contractors, working with general contractors, could derive means to extend seasonal working periods. This would increase the effective utilization of the workforce.

The starting point for labour market planning is included in Sections 3, 4 and 5 where new and detailed information describes the work in the trades. Results on apprentice registration and completions in Section 8 document how the current system will over react to cycles and leave the certified workforce dangerously short of talent.

9.3 Validation Process and Next Steps

The Committee recognizes that the implementation of the recommendations will require the extensive participation of representatives from the industry in all provinces. The first step in securing this participation was to validate the findings and recommendations presented in this report with a wide group of industry stakeholders.

A series of workshops were organized across Canada and masonry industry representatives were invited, including management, labour, PAC/TAC representatives and suppliers. Forty-eight industry representatives participated in the validation process.

Each workshop participant was sent a draft copy of the National Masonry Human Resources Analysis along with a list of key findings, conclusions and recommendations. They were asked to rate their level of agreement with each point on a scale of 1-5, with 1 being 'Strongly Disagree' and 5 being 'Strongly Agree'. In addition, they were asked to rank the three most important recommendations.

Overall, the level of agreement with the findings of the study was high. The average rating across all of the items was 4.2 out of a possible 5. There was discussion around some of the findings where the degree of agreement was not unanimous, or where the findings did not fit with existing perceptions. For example: in the survey, older workers reported a higher proportion of mobility than did younger workers. Some workshop participants felt that finding was counter-intuitive, while others agreed with it. In other cases, the discussion re-affirmed the findings, conclusions and recommendations, and made a stronger case to support them. Some of the perceptions and concerns from the workshops are captured in the following list:

- ❑ There was a degree of surprise in more than one group regarding the survey findings on health and safety statistics. Participants indicated that they would like to see some progress in that area.
- ❑ There are problems with certification. In some groups participants noted that the Red Seal exam is not reflective of the industry or of what is being taught in school.
- ❑ Testing is not satisfactory as different provinces apply different degree of rigor.
- ❑ Refractory workers are being certified without appropriate in-school training for refractory work. Refractory should have its own certification.

- ❑ There is not enough hands-on exposure for apprentices.
- ❑ Some contractors are not sending their apprentices to school until issues around testing are sorted out.
- ❑ In some areas, there were complaints about the quality of masonry products (block). The blocks were "out of square" and suppliers don't stand behind their products.
- ❑ Some of the newer types of construction (e.g. block warehouses) de-skills and/or under-utilizes the skills of a competent worker.
- ❑ Many new journeypersons do not have sufficient time on the tools before they get their certificate and are not worth journeyperson rates.
- ❑ Many of the industry-wide associations are disintegrating, contributing to further fragmentation.
- ❑ Immigration should not be ruled out as a future source of labour, particularly to meet short-term needs.
- ❑ There was discussion around labourers (mason tenders) and the awkwardness of accessing them from another union. This was seen as a barrier to entry to the trade.
- ❑ Some participants did not understand how there could be shortages in the trade while unemployment remains high. There was concern expressed by some labour representatives around the focus on apprenticeship and new intake, when most journeypersons were not getting sufficient hours in a year (some years it was less than 900 hours).
- ❑ Journeypersons are not retiring, they are being "burnt-out". There is no respect for the trade. Too much emphasis is put on speed and not enough on quality. Laying heavy blocks for extended time periods also could shorten a worker's career.
- ❑ The new Employment Insurance system penalizes seasonal workers.

The recommendations received a high level of approval, measuring from 4.3 to 4.8 on the scale of 1-5. The recommendation on "recapturing masonry market share" received the number one ranking in terms of importance. The second most important recommendation, as prioritized by the participants, was to "improve and expand apprenticeship training". There was no clear third-place ranking in terms of priority.

The validation process described here was just one of several efforts to reach out to Canada's masonry industry. This report represents the cumulative input of nearly one thousand workers, employers, suppliers and trainers in the masonry industry. Their views are the foundation of the findings, recommendations and next steps. The Steering Committee and the consultants wish to thank all those people for their contribution.

Appendix A

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Appendix A: Steering Committee Members

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Appendix B
Workers' Survey

Appendix C
Contractors' Survey