Skill trends in the building and construction trades

NCVER

in association with
DEWRSB

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Preface

FOLLOWING DISCUSSIONS ON emerging trade skill shortages between the Commonwealth Government and the leaders of Australia's major employer organisations – the Australian Chamber of Commerce and Industry (ACCI), the Australian Industry Group (AIG) and the Business Council of Australia (BCA) working groups were established to examine trade skills shortages. One of these groups was established to investigate skill shortages in the building and construction industry. Other working groups included electrotechnology, engineering and automotive repairs and service trades.

The National Centre for Vocational Education Research (NCVER) was represented on each of the industry-led working groups. NCVER provided key statistical information and analysis of issues in skill shortages in each of the trades under review. This analytical work proved important in each working group's deliberations about the specific nature of skill shortages in different trades and about proposals to address any emerging trade skill shortages.

This report on skill shortages in the building and construction trades is based on the analysis provided by NCVER to the Building and Construction Working Group. This work also draws upon key information provided to the working group by the Department of Employment, Workplace Relations and Small Business (DEWRSB).

This report makes use of the terms 'apprenticeships' and 'traineeships', 'new apprenticeships' and 'contracts of training'. For all intents and purposes the terms are interchangeable. However, by way of clarification, it should be noted that apprentices and trainees enter into a contract of training for the term of their apprenticeship or traineeship. Australia has had apprenticeships since the early 1800s. Traineeships were introduced in 1985 to complement the apprenticeship system. Apprenticeships and traineeships were merged into a single national system – new apprenticeships – on 1 January 1998.

1 Introduction

EMPLOYERS IN A number of critical economic sectors have been reporting difficulties in securing the necessary skills in their industries.

The building and construction trades are among those sectors experiencing difficulties in recruiting and retaining the right skilled people, although there has been an easing in these shortages in response to the downturn in construction. This report is one of a series of reports prepared by the NCVER and sets out to look in more detail at where shortages may be occurring through analysis of a range of data. In doing so, it looks first at what the common underlying factors giving rise to shortages might be. There are also factors that are specific to particular occupations and trades.

The building and construction industry experiences particular difficulties in relation to skill and labour supply because of the cyclical nature of the industry, which closely follows overall levels of economic activity. Particular strategies are needed to address this issue.

In developing appropriate industry or sector-based responses to skill shortages, it is necessary to first ascertain:

- to what extent skill shortages exist in terms of the types of skills in short supply and the areas where they are in short supply
- the underlying causes of the shortages that exist

With respect to underlying causes, skill shortages in the trades can arise from:

- an inadequate number of people entering trade training
- a high attrition rate during the training period, that means not enough people are completing trade training and attaining the qualifications necessary for highly skilled/technical work in the trades
- a high separation from the skilled trades workforce once people are qualified; due to a variety of reasons, such as low demand for skills, declining industry employment prospects or better careers and conditions being offered in other industries/sectors

Alternatively, skill shortages experienced may be an expression of:

- difficulties in recruiting new entrants with the right level of prior education, skills or attributes
- lack of training in particular segments of the industry because of structural factors such as out-sourcing or sub-contracting
- an insufficient level of activity by the existing trade workforce in upgrading skills once initial qualifications have been attained
- a failure in the provision of training to ensure that the quality and relevance of training provision is keeping up with rapidly changing skills needs in the workforce

Skill shortages may also be experienced because of a combination of some or all of the above factors.

In this report available evidence about patterns and trends in trades employment and training in the building and construction trades is reviewed in order to gauge the nature and extent of any skills shortages in these trades. The National Centre for Vocational Education Research (NCVER) has prepared this report, using information supplied by NCVER, the Australian Bureau of Statistics (ABS) and the Department of Employment, Workplace Relations and Small Business (DEWRSB).

The building and construction trades include[1]:

- Carpentry and joinery tradespersons
- Fibrous plasterers
- Roof slaters and tilers
- Bricklayers
- Solid plasterers
- Wall and floor tilers and stonemasons
- Painters and decorators
- Signwriters
- Floor finishers
- Plumbers

1. The building and construction trades have been defined in this report using a pre-specified list of occupations, based on the Australian Standard Classification of Occupations (ASCO). Therefore the information presented in this report may differ from that produced if an industry-based analysis were to be undertaken.

Non-trade on-site construction occupations include:

- Mobile construction plant operators
- Crane, hoist or lift operators
- Structural steel construction workers
- Insulation and home improvements installers
- Earthmoving labourers
- Paving and surfacing labourers
- Survey hands
- Construction assistants
- Concreters

2 Demand for skills in the building and construction trades

2.1 Employment levels

TOTAL EMPLOYMENT IN the construction trades workforce is around 285 400 people as at February 2001, making it the largest employer of the trades groups. This amounts to some 3.2% of all employment in Australia and accounts for about a quarter (24.2%) of total trades.

As shown in table 1, 61.4% of construction tradespersons are in structural construction trades, 19.5% are final finishes construction tradespersons and 19.3% are plumbers as at February 2001. The largest single construction trades occupation is carpentry and joinery, accounting for around one third (31.2%) of the total construction trades workforce followed by plumbers (19.3%) and painters and decorators (14.3%).

In addition, 169 600 people are employed in the main non-trade on-site construction occupations, representing 1.9% of total employment as at February 2001. The largest occupations in this group are mobile construction plant operators (31.8%), construction and plumbers assistants (22.3%) and concreters (14.4%). These three occupations account for around 70% of non-trade on-site construction employment.

2.2 Employment growth

The construction trades have experienced growth in employment over the two years to February 2001 (table 1). Construction trades employment increased by 13 600 or 5.0% over this period which was considerably stronger than for overall trades employment (1.5%). This represents an annual rate of growth of 2.5% over the two years to February 2001.

The growth in the construction trades followed a period of decline from the mid 1990s (figure 1). Even so, over the five years to February 2001, construction trades employment rose by 22 900 or 8.7% and it is 7.1% higher than ten years ago. Although overall employment in construction trades rose over the two years to February 2001, employment fell slightly in some occupation groups including bricklayers (down 1.4%) and floor finishers (down 24.0%).

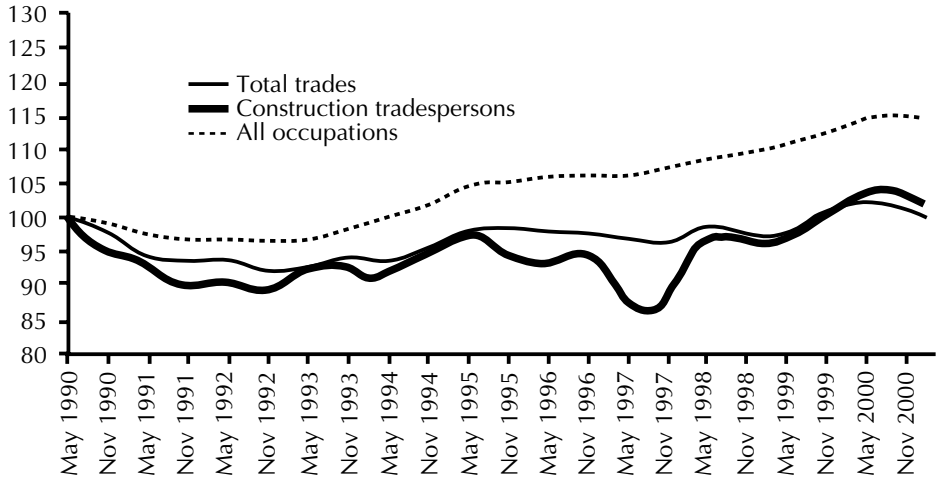
Table 1: Employment in construction trades and main non-trade on-site construction employment, February 1999 and February 2001

Trade	Employed Feb 1999 ('000)	Employed Feb 2001 ('000)	Share of construction trades employment, Feb 1999 (%)	Share of construction trades employment, Feb 2001 (%)	Annual growth rate* (%)
Structural construction tradespersons	163.5	175.3	60.2	61.4	3.5
Carpentry and joinery tradespersons	88.7	89.2	32.1	31.2	0.3
Fibrous plasterers	22.3	26.0	8.9	9.1	8.0
Roof slaters and tilers	7.2	9.9	3.0	3.5	17.8
Bricklayers	29.3	28.9	10.8	10.1	-0.7
Solid plasterers	4.1	5.4	1.1	1.9	14.9
Wall and floor tilers and stonemasons	12.0	15.9	4.4	5.6	15.0
Final finishes construction tradespersons	54.3	55.8	19.9	19.5	1.4
Painters and decorators	38.9	40.8	13.2	14.3	2.5
Signwriters	4.9	7.0	2.3	2.4	19.0
Floor finishers	10.5	7.9	4.5	2.8	-12.8
Plumbers	54.1	55.0	19.9	19.3	0.9
Total construction trades	**271.8**	**285.4**	**100.0**	**100.0**	**2.5**
Occupation	**Employed Feb 1999 ('000)**	**Employed Feb 2001 ('000)**	**Share of non-trade on-site construction, Feb 1999 (%)**	**Share of non-trade on-site construction, Feb 2001 (%)**	**Annual growth rate* (%)**
Mobile construction plant operators	49.5	54.0	31.4	31.8	4.4
Crane, hoist and lift operators	10.3	10.0	6.5	5.9	-1.5
Structural steel construction workers	10.4	10.8	6.6	6.4	1.9
Insulation and home improvements installers	14.4	13.8	9.1	8.1	-2.1
Earthmoving labourers	3.9	4.5	2.5	2.7	7.4
Paving and surfacing labourers	8.2	10.5	5.2	6.2	13.2
Survey hands	1.0	3.8	0.6	2.3	94.9
Construction and plumbers assistants	36.2	37.8	22.9	22.3	2.2
Concreters	23.9	24.4	15.1	14.4	1.0
Total non-trade on-site construction	**157.8**	**169.6**	**100.0**	**100.0**	**3.7**

Notes: * Annual growth rates are compound rates of growth.
Some components do not add to the total, while some percentages do not add to 100, due to rounding.
Source: DEWRSB trending of ABS *Labour Force Survey* data.

Employment has also increased over the two years to February 2001 for all non-trade construction occupations except insulation and home improvement installers (down 4.0%) and crane, hoist and lift operators (down 2.5%).

Figure 1: Construction trades, total trades and total employment, 1990-2001 (indexed May 1990 = 100)



Source: DEWRSB trending of ABS, *Labour Force Survey* data.

2.3 Overview of the demand for building and construction skills

The patterns of employment growth in the building and construction trades suggest an increase in employment in these trades. However, despite this increase, job vacancies for building and construction trades have fluctuated considerably over the last five years. DEWRSB's Skilled Vacancies Index (SVI) recorded a fall of 56.9 per cent for the building and construction trades over the last two years, compared with a fall of 28.7% for all trades. Over the last five years vacancies for the building and construction trades rose by 61.1%, despite job vacancies falling since April 2000, while all trades fell by 11.0%.

A precondition for the existence of skill shortages is usually (but not always) a rising demand for skilled labour in a growing labour market. It would appear that this is the case in the building and construction trades, with shortages reported where employment in most occupations is increasing.

The overall situation concerning the demand for trades skills in the building and construction sector is summarised in box 1.

Box 1: The demands for skills in the building and construction trades

- Total employment in the building and construction trades is around 285,400 people making it the largest employer of the trades group, representing about 3% of overall employment.
- Employment growth of 5.0% in the building and construction skilled trades workforce over the past two years has been stronger than for the workforces of all skilled trades in Australia.
- Job vacancies for building and construction trades have fluctuated considerably over the last five years.

3 Supply of skills to the building and construction trades

THE SUPPLY OF skills to the building and construction trades comes from four major sources.

- ❖ The skills of existing trades workforce, including the upgrading of skills of the existing workforce.
- ❖ New apprentices entering the building and construction trades.
- ❖ Skills training undertaken through other (non-apprentice) training pathways.
- ❖ Skilled migration into the building and construction trades.

Of course the other critical issue with respect to the supply of skills to the building and construction trades concerns the rate of skills replacement arising from skilled and qualified labour leaving these skilled trades occupations.

Each of these factors is examined below in this section of the report.

3.1 Skills of the existing building and construction trades workforce

Around 48% of the skilled trades workforce in the building and construction trades have post-school qualifications (table 2), compared to the average for the whole Australian workforce of around 42%.

The information in table 2 shows the highest qualification attained. Some of those with degrees, diplomas and associated diplomas may also have vocational qualifications.

For the building and construction trades as a whole:

- ❖ Only around 2% of employed persons have a diploma or associate diploma (or equivalent) as their highest qualification, which is a much lower rate than the 8% for the workforce as a whole.
- ❖ Around 44% possess a skilled vocational qualification, compared with a workforce average of 14% of employed persons having a vocational qualification as their highest level attained.

- Fewer than 1% of those in the building and construction trades possess a degree level or higher qualification, compared with over 15% having such qualifications in the workforce as a whole.

In relative terms, this means that the proportion of the workforce in the building and construction trades who possess relevant qualifications (ie diploma and other vocational qualifications) is high compared with the levels of qualifications attained in the workforce as a whole.

The numbers who have no formal post-school qualifications, but are working in the building and construction trades, represent around 45% of the total workforce. This is a similar level reported by the Australian workforce, around 50% having no post-school qualification in 1996. A summary of the situation concerning the existing skills of the existing workforce is given in box 2.

Box 2: The skills of the existing building and construction trades workforce.

- Some 48% of the existing building and construction trades workforce hold a post-school qualification, compared with only 42% of the workforce as a whole having qualifications.
- The incidence of vocational qualifications in the building and construction trades workforce is very high (44%), compared with around 14% of the national workforce having a vocational qualification.
- But 45% of the building and construction trades workforce have no formal qualifications. This situation may not meet contemporary industry needs for high level technical skills.

3.2 New apprenticeship patterns and trends

Australia's national and state/territory governments have reformed the apprenticeship and trainee system by making it more flexible and responsive to employer needs with the aim of ensuring that the highest quality training is provided. The new training arrangements covering apprenticeships and traineeships are collectively known as new apprenticeships. They were introduced from 1 January 1998.

Although new apprenticeships cover both apprentice and traineeship training, the vast majority of entry level skills training in the building and construction trades through contracts of training with employers occurs through the traditional apprenticeship pathway, leading to a Certificate III qualification (typically involving a four year apprenticeship contract).

Table 2: The education attainment of persons employed in the building and construction trades, and the total workforce, 1996

Occupational categories	Degree or higher	Diploma	Associate diploma	Skilled vocational qualification	Basic vocational qualification	Sub total with qualifications	No qualification	Not stated/ unknown	Total
4411 Carpentry & joinery tradespersons	500	370	1 290	43 460	790	46 420	18 650	4 280	69 350
4412 Fibrous plasterers	70	60	60	5 780	120	6 090	7 060	1 150	14 310
4413 Roof slaters & tilers	20	20	20	2 320	40	2 420	2 620	380	5 420
4414 Bricklayers	60	80	130	10 430	180	10 880	7 180	1 390	19 440
4415 Solid plasterers	10	10	(a)	670	20	720	880	140	1 740
4416 Wall & floor tilers & stonemasons	130	70	80	4 810	100	5 190	5 100	970	11 270
4421 Painters & decorators	350	240	200	15 530	320	16 620	12 810	2 550	31 980
4422 Signwriters	90	80	80	2 500	120	2 870	1 910	300	5 090
4423 Floor finishers	60	30	30	1 800	60	1 990	3 660	480	6 130
4431 Plumbers	150	190	480	32 140	460	33 410	8 730	1 900	44 040
7111 Mobile construction plant operators	100	120	180	4 260	570	5 220	21 420	1 740	28 370
7122 Crane, hoist or lift operator	100	40	40	1 150	620	1 950	4 760	530	7 230
7913 Structural steel construction workers	50	40	40	1 690	1 310	3 130	4 220	820	8 170
7914 Insulation & home improvements installers	110	90	120	2 640	190	3 150	4 730	540	8 420
9912 Earth moving labourers	30	10	20	370	60	490	1 980	160	2 640
9913 Paving & surfacing labourers	30	10	40	600	60	730	3 980	310	5 020
9914 Survey hands	130	40	140	250	60	620	1 560	100	2 290
9916 Construction and plumbers assistants *	280	140	200	3 190	390	4 200	14 780	1 240	20 220
9917 Concreters	80	70	100	2 520	160	2 940	13 090	1 140	17 180
Total building and construction trades	**2 340**	**1 710**	**3 250**	**136 100**	**5 640**	**149 040**	**139 140**	**20 120**	**308 300**
Percentage of building and construction trades	0.8	0.6	1.1	44.1	1.8	48.3	45.1	6.5	100
Percentage of total Australia workforce	15.5	4.5	3.5	14.2	3.8	41.5	51.3	7.2	100

Notes: * Includes plumbers assistants.
(a) Represents figures between 1 and 9 inclusive.

Sources: NCVER (1998) *The Outlook for Training in Australia's Industries,* Table A2 and ABS 1996 *Census of Population and Housing.*

The National Centre for Vocational Education Research (NCVER) reports that of the 33 100 contracts of training shown in table 3, apprenticed trades (at the Certificate III level or higher) account for over 97% of all those in a contract of training in building and construction trade occupations.

Table 3: Building and construction new apprenticeships, 31 December 2000

		Number of new apprentices	Proportion of total new apprentices (%)	New apprentices as a proportion of skilled trades workforce (%)
4411	Carpentry & joinery tradespersons	14 150	42.8	14.6
4412	Fibrous plasterers	1 100	3.3	3.6
4413	Roof slaters & tilers	870	2.6	8.0
4414	Bricklayers	1 800	5.4	7.0
4415	Solid plasterers	390	1.2	8.6
4416	Wall & floor tilers & stonemasons	1 100	3.3	7.2
4421	Painters & decorators	2 690	8.1	6.3
4422	Signwriters	390	1.2	5.9
4423	Floor finishers	420	1.3	4.8
4431	Plumbers	6 910	20.9	12.3
7111	Mobile construction plant operators	2 110	6.4	4.4
7122	Crane, hoist or lift operator	(a)	0.0	0.0
7913	Structural steel construction workers	10	0.0	0.1
7914	Insulation & home improvements installers	0	0.0	0.0
9912	Earth moving labourers	20	0.1	0.6
9913	Paving & surfacing labourers	0	0.0	0.0
9914	Survey hands	0	0.0	0.0
9916-11	Construction assistant	1 110	3.3	3.1
9917	Concreters	40	0.1	0.2
Total		**33 100**	**100.0**	**7.2**

Note: (a) Represents figures between 1 and 9 inclusive.
Source: NCVER unpublished apprentice and trainee data, March 2001 and ABS November *Labour Force Survey* data.

As can be seen from table 3, the number of new apprenticeships as a proportion of the skilled trades workforce varies between major occupations within the building and construction trades. Apprentices make up 14.6% of the total skilled trades workforce in the carpentry and joinery tradespersons occupation, 12.3% in plumbers, 8.6% in solid plasterers and 8.0% in roof slaters and tilers.

Overall, the proportion of new apprentices in the total building and construction trades workforce is 7.2%. This is lower than for all skilled trades in

Australia, where around 11.1% of the skilled trades workforce is supplied by those in new apprenticeships.

The proportion of the total building and construction workforce participating in apprenticeships, traineeships and new apprenticeships has risen from 6.1% in 1996 to 7.2% in 2000 (Table 4) with an annual growth rate of 4.3%. This compares favourably with the employment growth of 2.5% per annum in building and construction trades over the same period.

Table 4: Building and construction new apprenticeships compared to skilled trades workforce, 31 December 1996 to 2000

	1996	1997	1998	1999	2000	Annual Growth Rate %*
Skilled workforce(a) ('000)						
Building and construction trades	414.7	403.8	440.5	474.0	458.2	2.5
All trades	1 138.0	1 125.0	1 155.8	1 207.0	1 191.0	1.1
All persons	8 383.6	8 514.7	8 651.0	8 892.8	9 067.5	2.0
Number of new apprentices in-training (b) ('000)						
Building and construction trades	25.3	24.9	25.6	29.9	33.1	6.9
All trades	123.8	123.4	125.6	130.9	131.9	1.6
All persons	164.4	186.5	218.4	261.6	295.6	15.8
New apprentices as a proportion of skilled trades workforce						
Building and construction trades	6.1	6.2	5.8	6.3	7.2	4.3
All trades	10.9	11.0	10.9	10.8	11.1	0.5
All persons	2.0	2.2	2.5	2.9	3.3	13.5

Notes: * Annual rates of growth are compound growth rates.
(a) Based on ABS November Labour Force Survey data.
(b) As at 31 December based on NCVER unpublished apprentice and trainee data, March 2001.

The key issues to consider in relation to the contribution of apprentices are trainees to the supply of skills, are whether or not

- the numbers entering contracts of training are sufficient to meet industry needs, and
- the numbers staying in apprenticeships and traineeships to complete their training are adequate.

Apprenticeship training in the trades experienced a decline in Australia in the early 1990's from the record high levels of the late 1980's. Since the mid 1990's, we have seen a turnaround in this trend, with increasing growth in the past couple of years.

The number of apprentice and trainee commencements in the building and construction trades declined from 1995 to 1996. However, the NCVER reported strong growth during 1997 through 1999, followed by a slight decrease in commencements during 2000 (table 5).

The overall number of apprentices and trainees in training in the building and construction trades has risen since the mid 1990's with an annual growth rate of 5.0% over the period 1995 to 2000 (table 6).

The increase in the numbers in training over the period 1995 to 2000 compares favourably to the recent growth in employment of 1.8% per annum in the building and construction trades. The increases in apprentice and trainee commencements since 1995 in the building and construction trades will see an improvement with the raising of the ratio of new apprentices to the total skilled trades workforce in Australia's building and construction trades sector.

If we consider apprentice and trainee completions (table 7), we see that around 5,000 people completed their new apprenticeship in 2000. Taking a crude completion rate this amounts to a completion rate of around 64% of those commencements in 1996 (noting that the most prevalent contracts of training in these trades average around four years duration). Analysis undertaken by the NCVER suggests under reporting of completions by about 20% at the national level. On this basis the completion rate of 64% shown above is more likely to be over 70% given the relatively better rates of completion experienced in building and construction when compared with other trades. Recent DETYA[2] research also shows completion rates for apprentices at about 70% overall. This suggests a reasonably healthy rate of completion.

Moreover, strong growth in completions was attained between 1995 and 1998. However, the number of completions fell by around 18.2% in 1999 and then a further 5.3% in 2000. It is important to note however that the NCVER has suggested there may be inherent problems with completions data and they may be understated due to under reporting.

2. Attrition in apprenticeships: An analysis of apprentices commencing between July 1994 and June 1996, DETYA February 2000.

Table 5: Commencements in contracts of training in the building and construction trades, 1995 to 2000

		Number						Annual growth rate* 1995 - 2000 (%)	Growth rate 1999 - 2000 (%)
		1995	1996	1997	1998	1999	2000		
4411	Carpentry & joinery tradespersons	3 860	3 510	3 920	4 760	5 700	4 860	4.7	-14.8
4412	Fibrous plasterers	310	220	280	410	510	490	9.8	-3.3
4413	Roof slaters & tilers	230	210	250	370	510	340	8.6	-32.0
4414	Bricklayers	500	440	490	690	940	720	7.4	-23.4
4415	Solid plasterers	130	90	110	140	150	170	6.0	12.6
4416	Wall & floor tilers & stonemasons	370	310	300	430	450	440	3.2	-3.5
4421	Painters & decorators	770	640	730	900	1 110	1 150	8.4	3.5
4422	Signwriters	170	130	140	140	160	150	-2.7	-4.4
4423	Floor finishers	130	110	120	150	190	190	8.3	1.4
4431	Plumbers	1 790	1 510	1 700	2 290	2 600	2 310	5.2	-11.2
7111	Mobile construction pant operators	50	150	160	120	890	1 390	97.7	55.8
7122	Crane, hoist or lift operator	0	0	0	0	0	(a)	-	-
7913	Structural steel construction workers	0	0	0	10	(a)	(a)	-	256.3
7914	Insulation & home improvements installers	0	0	0	0	(a)	0	-	-100.0
9912	Earth moving labourers	0	0	10	10	10	20	-	48.1
9913	Paving & surfacing labourers	(a)	10	10	(a)	0	0	-100.0	-
9914	Survey hands	(a)	(a)	(a)	0	0	0	-100.0	-
9916-11	Construction assistant	30	490	730	960	710	920	93.2	28.6
9917	Concreters	0	0	0	10	110	60	-	-49.1
Total		**8 340**	**7 830**	**8 960**	**11 380**	**14 040**	**13 210**	**9.6**	**-5.9**

Notes: * Annual rates of growth are compound growth rates.
(a) Represents figures between 1 and 9 inclusive.

Source: NCVER unpublished apprentice and trainee data, March 2001.

Table 6: The number of apprentices and trainees in contracts of training as at 31 December in the building and construction trades, 1995 to 2000

		Number						Annual growth rate* 1995 - 2000	Growth rate 1999 - 2000
		1995	1996	1997	1998	1999	2000	(%)	(%)
4411	Carpentry & joinery tradespersons	12 900	12 240	11 930	11 930	13 480	14 150	1.9	5.0
4412	Fibrous plasterers	740	700	720	800	970	1 100	8.3	13.4
4413	Roof slaters & tilers	570	520	500	610	840	870	8.7	3.6
4414	Bricklayers	1 640	1 480	1 320	1 360	1 690	1 800	1.9	6.5
4415	Solid plasterers	290	290	310	310	340	390	6.5	14.7
4416	Wall & floor tilers & stonemasons	1 010	990	920	960	1 030	1 100	1.7	6.8
4421	Painters & decorators	2 180	2 160	2 120	2 080	2 310	2 690	4.3	16.5
4422	Signwriters	460	440	410	390	380	390	-3.0	2.6
4423	Floor finishers	350	350	350	360	380	420	3.5	10.5
4431	Plumbers	5 760	5 660	5 560	5 810	6 530	6 910	3.7	5.8
7111	Mobile construction plant operators	40	120	170	140	970	2 110	122.1	117.5
7122	Crane, hoist or lift operator	0	0	0	0	0	(a)	-	-
7913	Structural steel construction workers	0	0	0	(a)	(a)	10	-	-
7914	Insulation & home improvements installers	0	0	0	0	(a)	0	-	-
9912	Earth moving labourers	0	0	10	10	10	20	-	100.0
9913	Paving & surfacing labourers	(a)	10	10	(a)	0	0	-100.0	-
9914	Survey hands	(a)	(a)	(a)	0	0	0	-100.0	-
9916-11	Construction assistant	20	380	590	850	930	1 110	123.3	19.4
9917	Concreters	0	0	0	10	70	40	-	-42.9
Total		**25 950**	**25 350**	**24 920**	**25 630**	**29 920**	**33 100**	**5.0**	**10.6**

Notes: * Annual rates of growth are compound growth rates.
(a) Represents figures between 1 and 9 inclusive.

Source: NCVER unpublished apprentice and trainee data, March 2001.

Table 7: Completions from contracts of training in the building and construction trades, 1995 to 2000

		Number						Annual growth rate* 1995 - 2000	Growth rate 1999 - 2000
		1995	1996	1997	1998	1999	2000	(%)	(%)
4411	Carpentry & joinery tradespersons	2 130	2 790	3 000	3 120	2 530	2 470	3.0	-2.4
4412	Fibrous plasterers	90	140	150	160	110	100	1.2	-9.1
4413	Roof slaters & tilers	140	170	150	130	90	120	-3.0	33.3
4414	Bricklayers	240	330	360	290	240	170	-6.7	-29.2
4415	Solid plasterers	30	60	50	70	50	40	4.6	-20.0
4416	Wall & floor tilers & stonemasons	110	150	190	210	170	140	5.9	-17.6
4421	Painters & decorators	320	370	460	540	430	330	0.6	-23.3
4422	Signwriters	60	90	110	90	90	80	5.2	-11.1
4423	Floor finishers	50	50	50	60	60	50	1.7	-16.7
4431	Plumbers	1 090	1 100	1 290	1 400	1180	1 030	-1.2	-12.7
7111	Mobile construction plant operators	10	10	70	120	40	70	44.8	75.0
7122	Crane, hoist or lift operator	0	0	0	0	0	0	-	-
7913	Structural steel construction workers	0	0	0	0	(a)	(a)	-	-
7914	Insulation & home improvements installers	0	0	0	0	0	0	-	-
9912	Earth moving labourers	0	0	0	(a)	(a)	(a)	-	-
9913	Paving & surfacing labourers	20	0	10	(a)	(a)	0	-100.0	-
9914	Survey hands	(a)	(a)	(a)	(a)	0	0	-100.0	-
9916-11	Construction assistant	0	(a)	180	240	230	330	-	43.5
9917	Concreters	0	0	0	0	(a)	40	-	-
Total		**4 300**	**5 240**	**6 080**	**6 440**	**5 270**	**4 990**	**3.0**	**-5.3**

Notes: * Annual rates of growth are compound growth rates.
(a) Represents figures between 1 and 9 inclusive.

Source: NCVER unpublished apprentice and trainee data, March 2001.

Looking more specifically at commencements and numbers in training by level of qualification (table 8), the greatest annual growth rate from 1995 to 2000 was in Certificates I and II (45.6% and 32.6% respectively) compared to Certificate III and above (10.1% and 6.1%). However, numbers in the certificate I and II qualification categories are still very small.

Table 8: Building and construction trades by AQF level

	Number			Annual growth rates*	
	1995	1999	2000	1995-2000 (%)	1999-2000 (%)
Commencements					
Certificate III and higher	7 650	13 200	12 350	10.1	-6.4
Certificate I and II	130	840	860	45.6	1.5
Not known	570	0	0	-100.0	-
Total	**8 340**	**14 040**	**13 210**	**9.6**	**-5.9**
Total in training					
Certificate III and higher	23 900	28 780	32 140	6.1	11.7
Certificate I and II	200	800	830	32.6	4.4
Not known	1 850	350	130	-41.5	-63.7
Total	**25 950**	**29 920**	**33 100**	**5.0**	**10.6**

Note: * Annual rates of growth are compound growth rates.
Source NCVER unpublished apprentice and trainee data, March 2001.

A significant issue with respect to the supply of skills to the trades through new apprenticeships is the age of apprentices and trainees.

NCVER reports that the number of commencing apprentices (and trainees) aged 15 to 19 years increased at an annual rate of 5.9% between 1995 and 2000. The number of commencing apprentices (and trainees) in the 20 to 24 and 25 years or more age groups also grew however the biggest growth in commencements occurred in the 25 years and over age group (table 9). However, the numbers in the over 25 year age group are still relatively small.

NCVER reports that demographic projections show that the numbers of persons in Australia aged 15 - 24 years will not grow in absolute terms over the next 20 years. In fact the relative proportion of young people in the population will fall considerably. This means the source of new skills for the building and construction trades, as for all other occupations, will have to increasingly come from apprentices and trainees, who are older when commencing a contract of training.

The other issue of relevance here is the very low level of new apprenticeships in schools in relation to the building and construction trades. NCVER data shows that for the building and construction trade occupations, the number of apprentices and trainees who commenced their apprenticeship or traineeship whilst still attending school comprise an insignificant proportion for

each year from 1995 to 2000. In 2000 only 1.5% of commencements were at school in the building and construction trades compared with 1.9% for all trades.

Table 9: The age of new apprentices in the building and construction trades

	Number			Annual growth rates*	
	1995	1999	2000	1995-2000 (%)	1999-2000 (%)
Commencements					
15 – 19 year olds	6 200	9 090	8 270	5.9	-9.0
20 – 24 year olds	1 690	2 840	2 350	6.9	-17.1
25 years or more	440	2 110	2 580	42.3	22.2
All ages	**8 340**	**14 040**	**13 210**	**9.6**	**-5.9**
Total in training					
15 – 19 year olds	9 910	12 070	12 140	4.1	0.5
20 – 24 year olds	14 250	13 770	15 210	1.3	10.5
25 years or more	1 790	4 090	5 750	26.3	40.8
All ages	**25 950**	**29 920**	**33 100**	**5.0**	**10.6**

Note: * Annual rates of growth are compound growth rates.
Source: NCVER unpublished apprentice and trainee data, March 2001.

Clearly this is an area for consideration in any strategy to boost the intake of younger people to new apprenticeships in the building and construction trades.

A summary of the situation concerning the contribution of apprentices and trainees to the building and construction trades is given in box 3 below.

Box 3: The supply of building and construction apprentices and trainees

- The number of apprentices and trainees (now called new apprenticeships) in a contract of training with an employer in the building and construction trades is now around 33,000, having risen with an annual growth rate of 5.0% since 1995 and by 10.6% during 2000.
- Commencements in building and construction trades new apprenticeships fell by 5.9% during 2000, which followed a period of strong growth during 1997 through to 1999. This appears sufficient to meet projected employment levels based on recent growth levels and suggests insufficient entry to trades apprenticeships is currently not the predominant cause of any skill shortages.
- Apprentice and trainee completions in the building and construction trades grew strongly between 1995 and 1998.

3.3 Training undertaken through non-apprentice pathways

This section looks at the general vocational and education and training (VET) student population in 2000 for building and construction trade occupations.

It should be noted that for the apprentice and trainee data presented elsewhere in this report, the ASCO code is based in apprentices' and trainees' declared vocation, that is, the actual job that they are employed in. The data presented in this section are based on occupation codes assigned to courses to indicate the most likely occupation that the course is relevant to. However, students undertaking a VET course may not necessarily gain employment in the building and construction trades occupation assigned to the course.

The data in this section therefore provides a rough estimate of the amount of non-apprentice and non-trainee VET activity relevant to the building and construction trade occupations, regardless of whether or not this training is actually utilised in these occupations.

Indications are that the number of VET course enrolments relating to the building and construction trades was around 62 840 in 2000. Over half (53.6%) of these were at AQF level III or equivalent or higher levels (table 10).

This means that non-apprenticeship training pathways are a strong source of skills for the building and construction trades.

The NCVER figures show that by the end of 2000 (ie. on 31 December 2000) there were 33 100 people in new apprenticeships in the building and construction trades. This compares with 62 840 enrolments during 2000 in VET courses that are orientated towards skills for the building and construction occupations but do not necessarily involve a new apprenticeship.

A wide variety of training is occurring in these programs, such as Certificate III in general construction; Certificate III in carpentry and joinery or bricklaying; trade certificate in plumbing; or an apprenticeship certificate in plumbing and gas fitting. Of the students doing these types of courses:

- 2.5% were in advanced/high level courses leading to certificate IV level qualifications.
- 51.0% were in certificate III programs, which are traditionally done through apprenticeships.
- 11.3% were in certificate I and II level programs.
- 35.2% were undertaking skills training not leading to award or full qualifications.

In 2000, the most common VET courses undertaken were in the areas of general construction, carpentry, plumbing/gasfitting, civil construction, bricklaying, painting and decorating.

This non-apprentice training activity represents a range of training pathways, from advanced technical courses leading to high level qualifications through to persons already employed in the industry upgrading their skills through enrolment in one or more modules.

The importance of non-apprenticeship pathways as a source of skills for building and construction trade occupations is summarised in box 4 below.

Box 4: Non-apprentice pathways for skills in building and construction trades

- Alternative vocational pathways are an important source of skills for building and construction trade occupations in Australia in addition to the traditional apprenticeship pathway.
- Throughout 2000 there were some 29,740 enrolments in vocational education and training programs that were not new apprenticeships. This compares with 33,100 new apprentices in training at the end of 2000.
- Non-apprenticeship pathways need to be given as much priority as new apprenticeship pathways in any overall skill formation policies for the building and construction trades, particularly given that new sources of relevant skills will need to come increasingly from older persons in the future.

Table 10: Training in the building and construction trades: VET course enrolments, 2000

		Diplomas	AQF Certificate IV and equivalent	AQF Certificate III and equivalent	AQF Certificates I and II	Other	Non award courses	Total Enrolments
4411	Carpentry & joinery tradespersons	0	(a)	16 460	1 670	20	160	18 320
4412	Fibrous plasterers	0	0	700	(a)	0	30	730
4413	Roof slaters & tilers	0	0	380	0	0	0	380
4414	Bricklayers	0	0	1 800	190	60	80	2 130
4415	Solid plasterers	0	0	260	40	0	20	320
4416	Wall & floor tilers & stonemasons	0	0	900	100	0	70	1 060
4421	Painters & decorators	0	40	2 350	130	120	180	2 800
4422	Signwriters	0	80	340	30	140	50	640
4423	Floor finishers	0	0	300	10	770	0	1 080
4431	Plumbers	60	1 390	6 330	240	1 060	2 000	11 080
7111	Mobile construction plant operators	0	80	1 880	(a)	620	470	3 050
7122	Crane, hoist or lift operator	0	0	50	0	340	130	520
7913	Structural steel construction workers	0	0	10	50	1 970	1 090	3 120
7914	Insulation & home improvements installers	0	0	0	290	0	140	430
9912	Earth moving labourers	0	0	10	0	0	0	10
9913	Paving & surfacing labourers	0	0	70	850	100	10	1 020
9914	Survey hands	0	0	(a)	40	0	0	40
9916-11	Construction assistant	0	0	190	3 430	8 910	3 540	16 060
9917	Concreters	0	0	0	40	20	0	50
Total		**60**	**1 590**	**32 030**	**7 110**	**14 130**	**7 970**	**62 840**

Note: (a) Represents figures between 1 and 9 inclusive.
Some totals may not sum exactly due to rounding.

Source: NCVER unpublished 2000 VET data.

3.4 Migration as a source of building and construction skills

Migration of skilled labour is a source of skills that supplements the domestic skill base in the construction trades.

Table 11: Migration of construction tradespersons

Year	Permanent & long-term arrivals	Permanent & long-term departures	Net permanent and long-term			
			Settler	Long-term residents	Long-term visitors	Permanent & long-term total
1996-97	2 214	1 501	558	338	-183	713
1997-98	2 954	2 258	474	430	-208	696
1998-99	3 264	2 261	910	194	-101	1 003
1999-00	3 622	2 707	925	305	-315	915

Source: Data supplied to NCVER by DEWRSB.

Table 12: Migration of construction tradespersons by occupation 1999-2000

Trade	Permanent & long-term arrivals	Permanent & long-term departures	Net permanent and long-term			
			Settler	Long-term residents	Long-term visitors total	Permanent & long-term
Carpenters and joiners	1 167	861	312	101	-107	306
Fibrous plasterers	50	44	11	1	-4	6
Roof slaters and tilers	67	35	27	1	4	32
Bricklayers	244	195	81	20	-52	49
Solid plasterers	146	103	61	4	-22	43
Wall/ floor tilers and stonemasons	130	127	42	0	-39	3
Painters and decorators	572	399	181	77	-85	173
Signwriters	46	33	4	10	-1	13
Floor finishers	37	23	14	2	-2	14
Plumbers	441	288	130	24	-1	153

Source: Data supplied to NCVER by DEWRSB.

DEWRSB reports that in recent years net migration of construction tradespersons has fluctuated between 700 to 1 000 persons, with arrivals of between 2 200 to 3 600 partly offset by departures of between 1500 to 2700 (tables 11 & 12).

3.5 Qualified workers not in building and construction occupations

The issue of the extent to which qualified and skilled tradespersons leave their employment in their skilled trade is a critical one. This is because the formation of new skills in the trade must be sufficient:

- not only to meet skills needed to fuel growth in the industries,
- but also to replace those leaving the occupation.

DEWRSB reports that the proportion of construction tradespersons who leave these occupations appears to be below the average for all trade occupations. Nevertheless a considerable proportion of qualified construction tradespersons leave trade employment for non-trade employment. Analysis of 1996 Census data shows for those with construction trade qualifications and aged 15 or over:

- 41% were working in a trade occupation.
- 30% were working in a non-trade occupation.
- 7% were unemployed.
- 21% were not in the labour force (includes those who retire).

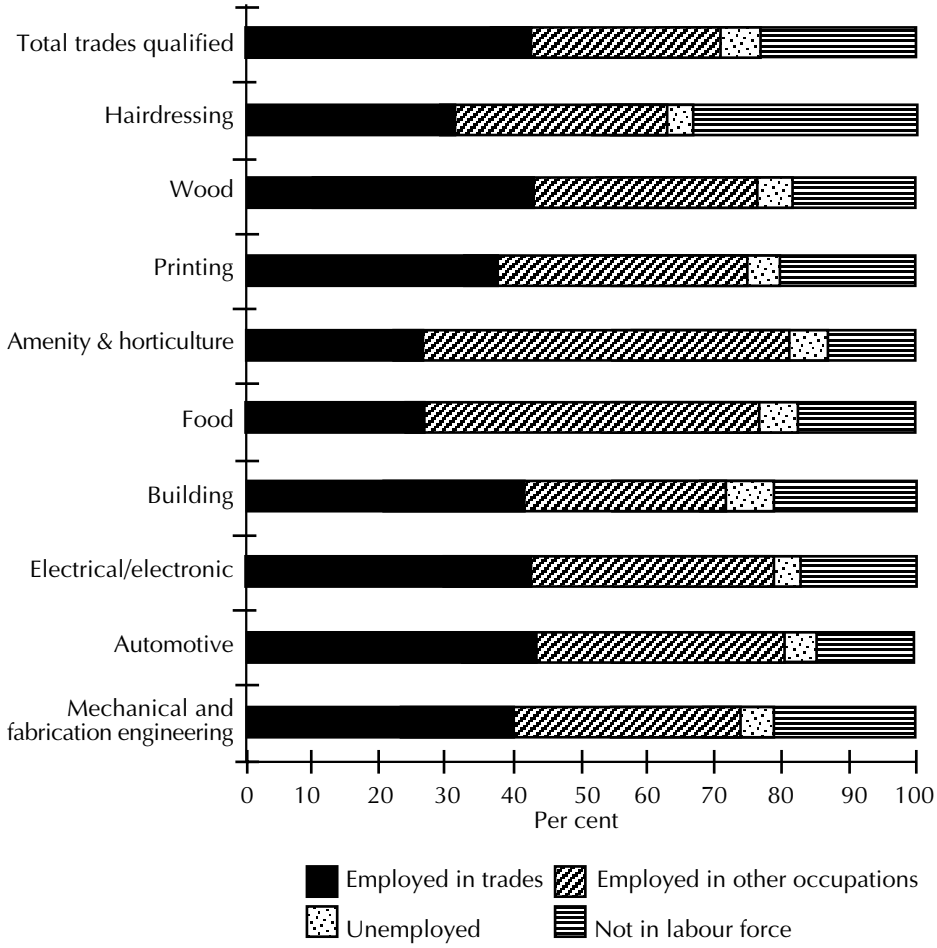
The proportion of qualified construction tradespersons who were working in their trade (41%) was higher than the average (38%) for all trades in the Australian workforce (figure 2).

The DEWRSB analysis shows that career progression by construction tradespersons is a significant component of replacement. Slightly more than half (52%) of the 30% of construction tradespersons working in a non-trade occupation were employed in a more highly skilled occupation while the remainder were employed in a less skilled occupation.

Those moving to a more highly skilled occupation moved to a wide range of occupations; with building and construction managers and building associate professionals being a key area of employment.

Those moving to lesser skilled occupations also moved to a wide range of occupations, the most important of the lesser skilled occupations being truck drivers, sales representatives, and sales assistants.

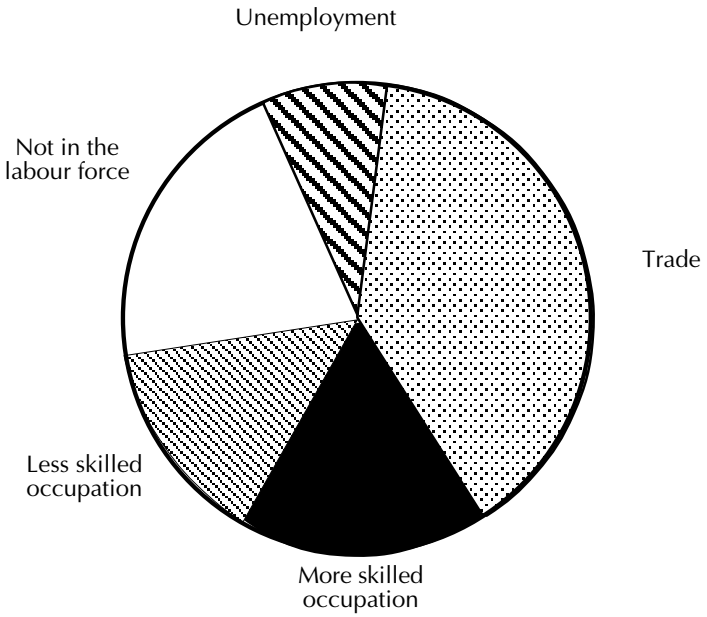
Figure 2: Trades qualified persons aged 15 and over - Proportion in trades employment, employed in other occupations, unemployed and not in the labour force, 1996



Note: 'Other Occupations' includes occupations not adequately described and not stated.
Source: Figure supplied to NCVER by DEWRSB based on data from the 1996 ABS Census of Population and Housing.

Workers leaving skilled trades can often be due to an ageing of the skilled workforce and the retirement of skilled workers. However, the loss of skills occurring from the construction trades does not appear to be due to a higher than average age profile as in general, construction trades tend to have a slightly younger age profile than that of all trades and of all occupations. However, the age profiles vary between specific construction occupations (table 13).

Figure 3: Occupational destination of those with construction trade qualifications



Source: Figure supplied to NCVER by DEWRSB based on data from the 1996 ABS Census of Population and Housing.

Those construction trade occupations which have a proportion of 45 to 64 year olds relatively higher than the proportion for all trades (26.9%) include painters and decorators (35.4%), signwriters (31.8%), floor finishers (29.8%) and plumbers (29.5%). In contrast, roof slaters and tilers have the lowest proportion of 45 to 64 year olds (12.4%), possibly due in part to the physical demands of the job making it difficult for older workers.

The age profiles of non-trade construction occupations also vary between specific occupations with some having a relatively young profile, while others are skewed towards older age groups. For instance:

- Construction and plumbing assistants, survey hands and earthmoving labourers have relatively young profiles.
- Around half of survey hands were aged 15 to 24 years.
- Crane, hoist and lift operators, paving and surfacing labourers, mobile construction plant operators and structural steel construction workers have a relatively old age profile.
- 45.5% of crane, hoist and lift operators and 41.2% of mobile construction plant operators were aged 45 years or over.

Table 13: Percentage of construction trades and non-trade on-site construction occupations by age group

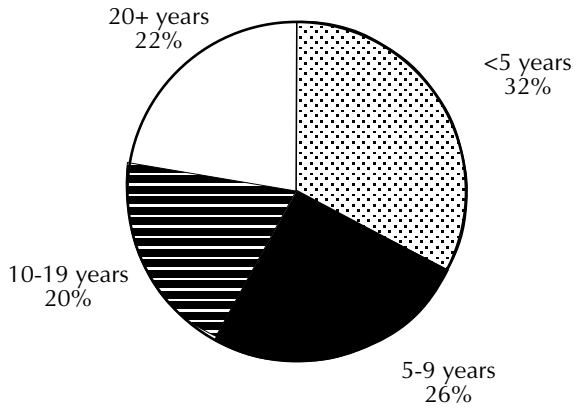
Occupation	Age Range		
	15-24	25-44	45-64
Structural construction tradespersons			
Carpentry and joinery tradespersons	25.4	47.9	26.8
Fibrous plasterers	22.5	55.7	21.7
Roof slaters and tilers	34.4	52.7	12.4
Bricklayers	19.9	56.7	23.5
Solid plasterers	12.8	63.1	24.1
Wall and floor tilers and stonemasons	19.6	55.0	25.5
Final finishes construction tradespersons			
Painters and decorators	16.9	47.8	35.4
Signwriters	18.6	49.9	31.8
Floor finishers	23.2	47.0	29.8
Plumbers	23.2	47.3	29.5
Non-trade construction occupations			
Mobile construction plant operators	8.9	49.9	41.2
Crane, hoist and lift operators	3.6	50.7	45.5
Structural steel construction workers	15.6	56.3	28.6
Insulation and home improvements installers	15.2	59.1	25.7
Earthmoving labourers	24.0	64.3	12.4
Paving and surfacing labourers	13.1	50.2	37.0
Survey hands	50.2	35.5	15.4
Construction and plumbers assistants	31.8	51.7	16.7
Concreters	21.7	60.3	18.0
All trades	**21.2**	**51.9**	**26.9**
All occupations	**18.4**	**49.3**	**32.2**

Source: Data supplied to NCVER by DEWRSB based on data from the ABS *Labour Force Survey*, average 2000.

DEWRSB reports 32% of construction tradespersons who left their trade did so within five years of employment while 58% of those who left their trade did so within the first 10 years of employment in their trade (figure 4). This represents a lower pattern of early exodus than for the trades group as a whole.

It is also important to consider the reasons why construction tradespersons leave their trade when looking at what can be done to increase the retention of skills in the construction trades. DEWSRB reports that, according to the ABS publication on Career Paths of Persons with Trade Qualifications, the main reasons why construction tradespersons left the trade were because they were "laid off, or lack of work", or because of "family, personal or ill health". These reasons were given by 28.0% and 22.2% respectively of construction tradespersons (table 14).

Figure 4: Trades qualified persons who have left the construction trades, by time in trade



Source: Supplied to NCVER by DEWRSB and based on ABS, Career Paths of Persons with Trade Qualifications, Australia, 1993.

Table 14: Percentage of main reason trade qualified persons left the construction trades

Laid off, or lack of work	28.0
Family, personal, or ill health	22.2
Wanted a change, or dissatisfied with job	14.9
Sought better pay, lack of career prospects or promoted	14.5
More job security or sought better physical working conditions	13.8
Other	6.7
Total	**100.0**

Source: Supplied to NCVER by DEWRSB and based on ABS, Career Paths of Persons with Trade Qualifications, Australia, 1993.

The ranking pattern of reasons for leaving the construction trades was slightly different to that for all trades. The proportion of construction tradespersons who cited "laid off, or lack of work" or "family, personal or ill health" were higher than for the total trades group. For the total trades group, 21% cited "laid off, or lack of work" as the main reason for leaving the trade and 19% left for "family, personal or ill health".

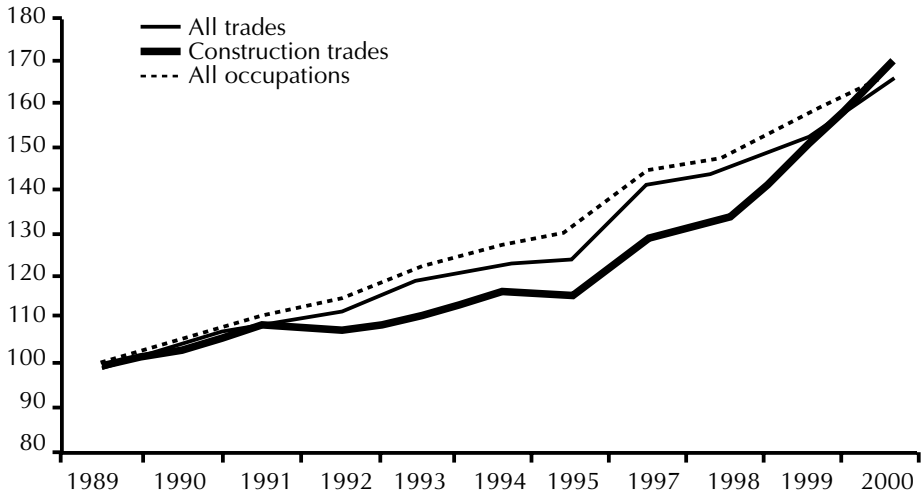
A number of factors could account for those who "wanted a change, or (were) dissatisfied with work". These include a desire for less physically demanding work (including not working outside in hot or cold weather).

DEWRSB also reports that there is some evidence to suggest that a significant number of those who left their trade could be enticed back. The ABS survey also showed that, of those who left the construction trades, 47% would consider returning to the construction trades. This is similar to that for the trades group in total where 46% would consider returning to their trades.

A return to the construction trades was not, however, unconditional. The extent of ready availability of trade and alternative non-trade employment is the major consideration, cited by 60% of potential returnees.

It is interesting to note that the rate of earnings growth for construction trade employees has been lower than that of the trades generally and of all employees (figure 5). However, it should be noted that the growth in earnings for construction trade employees has been stronger than all trades and for all occupations during the last two years. In fact, the average weekly earnings of construction trades employees ($770) in 2000 was higher than that of trades ($729) generally, but lower than that of all employees ($801).

Figure 5: Indexed average weekly earnings for construction trades, all trades and all occupations, 1989–2000



Source: Supplied to NCVER by DEWRSB and based on ABS, Employee Earnings, Benefits and Trade Union Membership (Cat No. 6310.0).

DEWRSB also notes that replacement from the construction trades in the next few years is likely to be similar to that for other trades in the Australian economy (table 15).

Table 15: Occupational replacement projections

Trade occupation (ASCO Second Edition)	Replacement to 2004-05
Mechanical engineering tradespersons	⇓⇓
Fabrication engineering tradespersons	⇑
Automotive tradespersons	⇓
Electrotechnology tradespersons	⇓
Structural construction tradespersons	⇔
Final finishes construction tradespersons	⇔
Plumbers	⇓⇓
Food tradespersons	⇑
Skilled agricultural workers	⇓⇓
Horticultural tradespersons	⇔
Printing tradespersons	⇔
Wood tradespersons	⇓
Hairdressers	⇑⇑
Textile, clothing/related tradespersons	⇔
Miscellaneous tradespersons	⇓
Total tradespersons	⇔

⇑⇑ high ⇑ above average
⇔ average ⇓ below average
⇓⇓ low

Source: Replacement projections prepared by the ACER Centre for the Economics of Education and Training, Monash University under contract to DEWRSB.

The implications of the replacement of skills from the construction trades workforce on the overall supply of skills to these trades are summarised in box 5.

Box 5: The implications of skills replacement for the skilled construction trades workforce

- The building and construction trades have been more successful than the average of other trades in retaining qualified persons within the skilled trades workforce. Some 41% of qualified construction tradespersons are working in their trades, compared with only 38% for all trades.
- Of those now not working in a building and construction trade, the majority are working in other areas of the labour market, rather than having left the labour market or becoming unemployed.
- Forecasts in the future are for average occupational replacement rates for structural and final finishes construction tradespersons and very low replacement rates for plumbers.
- There is some potential to reduce the loss of skills from these trades as 47% who have left say they would consider returning with improved pay and career prospects which is similar to the 46% all trades average who say they could be induced to return to their trade.

4 Overview of skill trends in the building and construction trades

THE EVIDENCE PRESENTED to date suggests that the combination of commencements in new apprenticeship training and the now very significant set of non-apprenticeship training pathways to the building and construction trades have been sufficient to keep up with overall employment levels in the building and construction trades.

In terms of traditional measures of skill shortage, the building and construction trades do not appear to be in a critical stage of demand, given the factors described below.

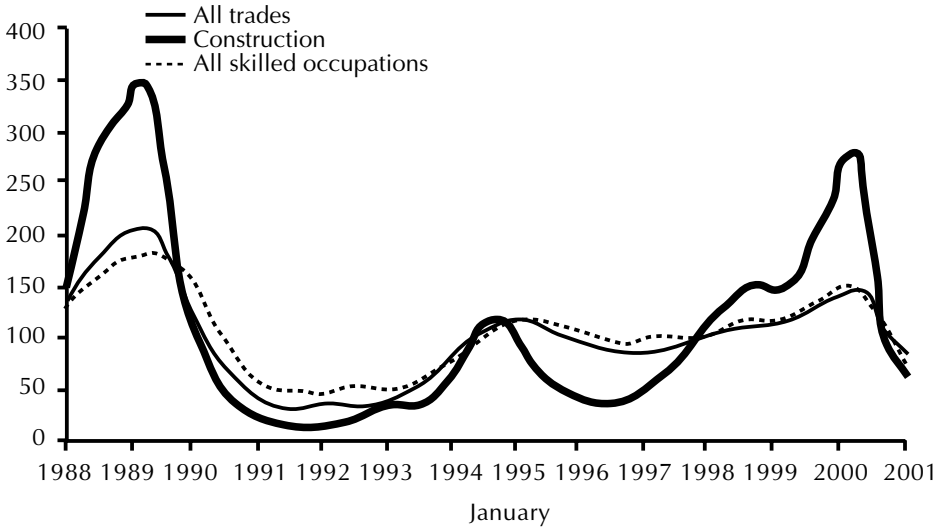
- The increases in apprentice and trainee commencements in the building and construction trades will see an improvement with the raising of the ratio of new apprentices to the total skilled trades workforce in Australia's building and construction trades sector.
- An increase in the growth of new apprentice completions over the period 1995 to 2000.

4.1 Vacancy growth

DEWRSB note that job vacancies for building and construction trades have fluctuated appreciably reflecting the cyclical nature of much of building and construction activity.

DEWRSB carries out a periodic Skilled Vacancies Index. From the survey, a fall of 56.9% in vacancies for the building and construction trades was recorded over the two years to February 2001 (figure 6). This growth in vacancies compares with a fall of 28.7% for all trades over the same period. In contrast, there has been a significant rise in vacancies in the building and construction trades (61.1%) over the five years to February 2001, while all trades fell by 11.0% in this period.

Figure 6: Trends in skilled vacancies – construction trades, all trades and all skilled occupations, January 1988 to February 2001



Source: Supplied to NCVER by DEWRSB, *Skilled Vacancies Index*.

5 Conclusion

IN CONCLUSION, THE building and construction trades are reporting skills shortages and this needs to be addressed through a variety of strategies. It is important to note though that the shortages do not arise from traditional causes of skill shortage such as high levels of separation from the trades nor at this stage, from low take up of apprentices or low levels of stock of skills in the workforce. On all of these indicators the sector compares favourably with other trade workforces and with the workforce as a whole. The decline in commencements of apprenticeships over the period 1995 to 1996 reported by the NCVER followed record high levels of the late 1980s and the late 1990s is showing increasing growth. This is in line with projected increase in demand and net growth in employment.

The particular difficulties experienced in the building and construction industry in relation to the recruitment and retention of skilled labour are in part a product of the cyclical nature of the industry. This is in general a disincentive to employers and to apprentices in entering the trade despite relatively strong levels of retention (41% compared with 38% for all trades) for those who enter. Coupled with this is a reasonably high level of career progression out of the trades into managerial and supervisory positions (50% of those in non-trade occupations). Shortages may also be a result of the structure of the industry, which is made up increasingly of specialist sub contractors. The need to upgrade the skills of existing older workers is also an issue of increasing importance.