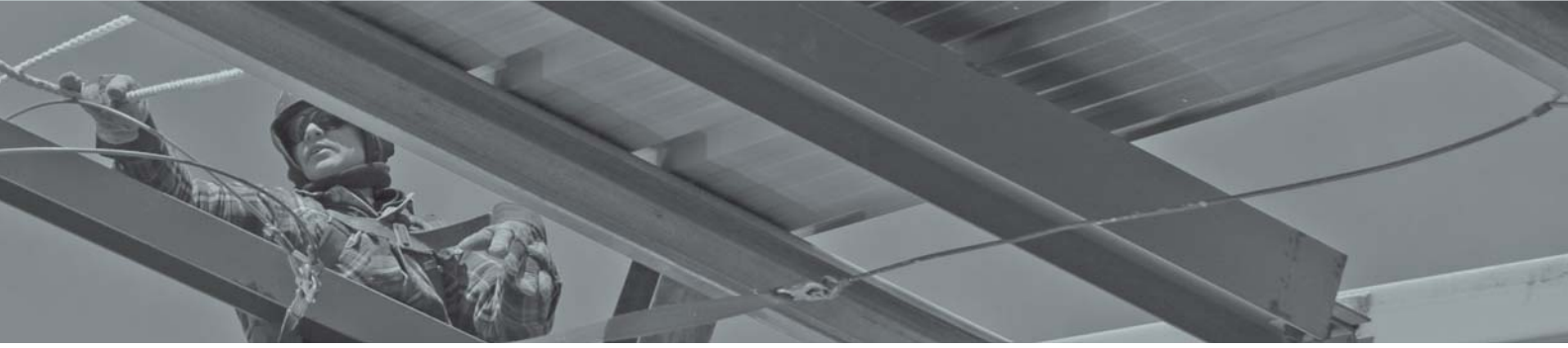




Alberta Construction Workforce
Supply Demand Forecast
2004-2008



Introduction

This article summarizes the Construction Workforce Development Forecasting Committee's (CWDFC) annual outlook for selected construction-related trades in Alberta. More detailed information on the outlook will be published on the CWDFC website, which is currently under construction but should be running soon. You will find it once completed at www.coaa.ab.ca.

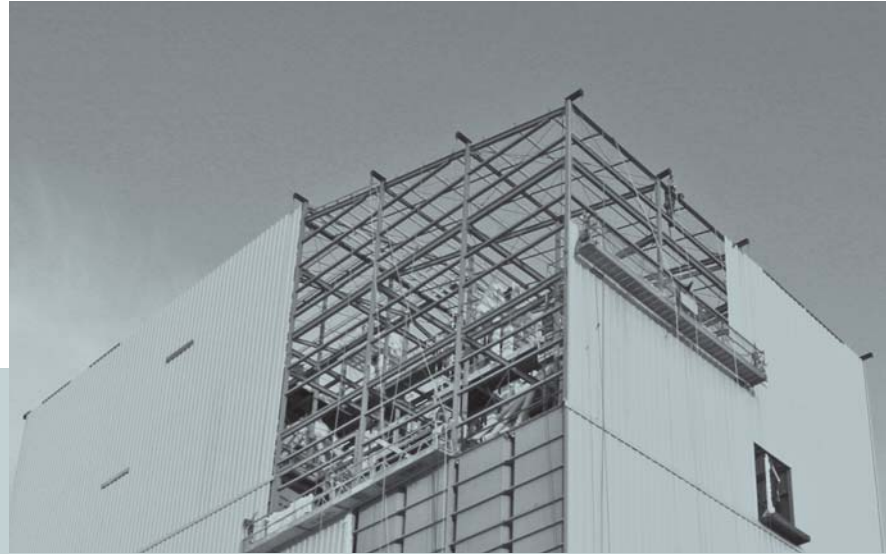
The demand for construction-related trades in Alberta continues to be strong in line with continued strong investment activity in the province. While residential construction activity is predicted to decline over the next few years, non-residential construction investment, led by rising investment for major oilsands projects, will increase the demand for related construction trades to 2006, after which trades requirements fall as major project investment declines. For a number of trades the current tightness of the demand-supply balance will likely remain or increase to 2006 before easing thereafter.

The requirements for the trades in major industrial projects estimated by the CWDFC show a difference in time pattern and magnitude from that found in last year's outlook. Trades requirements peak in 2006, rather than in 2005, as some projects and project schedules have been changed. The total amount of trades required is larger and the peak year requirements less than that found in last year's list. Plumber-pipefitters and electricians continue account for the largest amount of requirements for the major projects.

If all of the major industrial projects currently projected to go ahead over the next few years proceed as they are scheduled, we will again see considerable strain on our supply of skilled trades for 2005 running into the first quarter of 2007, at which time we should see it begin to ease off. This easing off may come just in time to see the demand for workers swell on the Mackenzie Valley Pipe Line Project. A pipeline project typically wouldn't put demands on all of the trades we follow in this forecast. Nevertheless, it will likely put some strain on the supply of welders and equipment operators.

TABLE 1
Alberta and Trading Partners Economic Performance

| | 2004 | 2005 | 2006 | 2007 | 2008 |
|---------------------------------------|------|-------|-------|-------|-------|
| TRADING PARTNERS | | | | | |
| GDP Growth (%) | | | | | |
| United States | 4.9 | 4.3 | 3.7 | 3.0 | 2.8 |
| Canada | 2.9 | 3.1 | 2.3 | 3.3 | 2.8 |
| GDP Inflation (%) | | | | | |
| United States | 0.9 | 1.0 | 1.4 | 1.8 | 2.0 |
| Canada | 1.8 | 1.1 | 1.8 | 1.5 | 1.4 |
| 3-Month Treasury Bill Rate (%) | | | | | |
| United States | 2.0 | 3.6 | 4.1 | 4.1 | 4.1 |
| Canada | 2.5 | 3.0 | 3.7 | 3.7 | 3.6 |
| Exchange Rate (\$US) | | | | | |
| WTI Oil (\$US/bbl) | 0.75 | 0.736 | 0.731 | 0.723 | 0.712 |
| AECO Natural Gas (C\$/MMBTU) | 29.0 | 26.5 | 25.7 | 26.0 | 26.5 |
| | 7.15 | 6.52 | 5.93 | 5.91 | 6.29 |
| Alberta | | | | | |
| Real GDP Growth (%) | 3.6 | 3.1 | 2.8 | 2.2 | 2.0 |
| Consumer Expenditures | 3.2 | 2.5 | 3.3 | 2.4 | 1.8 |
| Government Expenditures | 2.1 | 2.4 | 2.3 | 2.1 | 1.9 |
| Investment Expenditures | 5.0 | 8.2 | 6.2 | -2.7 | -2.1 |
| Exports | 3.9 | 2.8 | 3.1 | 4.3 | 3.5 |
| Imports | 3.5 | 4.8 | 3.4 | 1.3 | 1.0 |
| GDP Inflation (%) | 1.7 | -0.1 | 0.9 | 1.6 | 1.9 |
| CPI Inflation (%) | 1.9 | 1.4 | 2.0 | 1.7 | 1.6 |
| Hourly Earnings Inflation | 3.6 | 3.6 | 3.5 | 3.0 | 2.6 |
| Employment Growth (%) | 2.4 | 1.9 | 2.1 | 1.2 | 0.8 |
| Unemployment Rate (%) | 4.7 | 4.8 | 4.5 | 4.8 | 5.2 |
| Population Growth (%) | 1.6 | 1.7 | 1.4 | 1.4 | 1.0 |
| Housing Starts (000s) | 32.3 | 30.0 | 26.4 | 24.8 | 23.7 |



Economic Environment

Alberta's economy is expected to perform well over the next few years, as the economies of its major trading partners strengthen and oil and gas prices remain at levels conducive to continued strong investment in the oil and gas industry—see Table 1.

Trading Partners

The United States economy, one of Alberta's largest trading partners, is predicted to grow in excess of 4.0 per cent both this year and next, and to average near 3.0 per cent to 2009. Canadian growth will improve from its relatively poor performance in 2003, but remains below U.S. growth over the next two years, as the economy adjusts to the higher value of the exchange rate. Stronger North American growth will cause short-term interest rates to rise to 4.0 per cent by 2005, but inflation will remain below 2.0 per cent per year. Canadian interest rates will rise slower than U.S. rates because of relatively slower Canadian economic growth leading to a depreciation of the exchange rate from its current level to average around \$U.S. 0.73 to 2009.

A strengthening world economy and instability in the Middle East is predicted to cause oil prices to remain higher than was anticipated by almost all analysts last year. The price for West Texas Intermediate (WTI) oil at Cushing is predicted to fall to near \$U.S. 26 per barrel over the next couple of years before rising to 2009. Last year, many analysts were predicting WTI oil to fall to near \$U.S. 20. The drop anticipated for natural gas prices is also smaller this year, with AECO C gas predicted to remain above \$C 5.0 per MMBTU before rising to over \$C 6.0 in 2008.

Alberta

With these positive conditions for Alberta's external economic environment, the Alberta economy grows on average just below 3.0 per cent per year over the next few years. The main driver behind this performance is investment expenditures, which grow 6.5 per cent per year on average to 2007 and then decline as investment in major oilsands projects in the province begins to fall. Exports also register a relatively strong performance, reflecting increased trading partner growth and the increased capacity added by oilsands investment.

Employment growth averages 1.7 per cent per year to 2008 in line with rising GDP and labour productivity averaging 1.0 per cent per year. A current relatively low unemployment rate combined with employment growth causes population growth to average about 1.5 per cent per year over the period. The unemployment rate bottoms out at 4.5 per cent in 2006 before rising back toward 5.0 per cent.

Low inflation in Alberta's trading partners along with falling energy prices results in GDP inflation—inflation for products produced in the province—to average 1.2 per cent, while consumer price inflation averages somewhat higher at 1.7 per cent. Continued low unemployment and productivity growth result in average hourly earnings in the province rising 3.3 per cent on average to 2008.

Major Projects

The major projects list assembled by the CWDFC, which is derived from the Alberta Economic Development project list, suggests a continued strong level of investment in the province over the next few years.

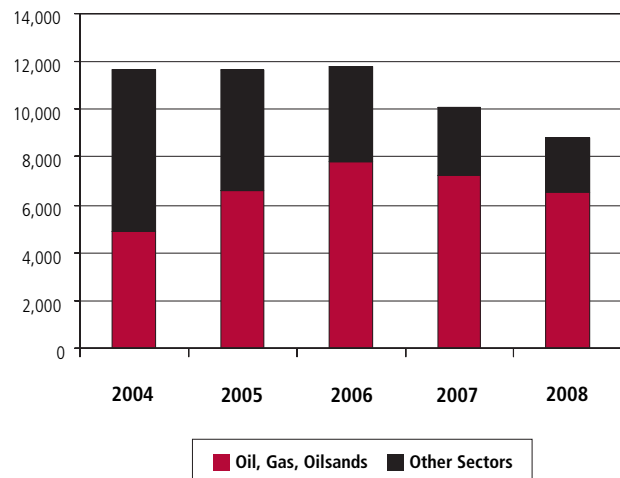
The total value of projects in this year’s list continues to show growth, but such growth is much slower than that observed during the late 1990s. As in previous lists, oil, gas, and oilsands projects account for the major portion of expenditures at \$51.4 billion, down slightly from \$52.4 billion in the 2003 list. There is a noticeable change in the number of pipeline projects in this year’s list, along with infrastructure and institutional projects.

The time pattern of these expenditures shows the peak in investment occurring in 2006 at \$7 billion—see Figure 1. The average annual value of these expenditures over the period to 2008 is \$4.2 billion. Oil, gas and oilsands investments remain above \$6 billion after 2004.

Investment Outlook

As mentioned above, the major driving force behind the performance of the Alberta economy is the performance of investment expenditures. In addition to the expenditures for major projects discussed above, there are investment expenditures for residential construction, projects that are not announced, and for maintenance and replacement of existing facilities and equipment.

FIGURE 1
Major Project Expenditures (\$ MILLIONS)



SOURCE: CWDFC

TABLE 2
CWDFC Major Project Lists

| SECTOR | 2002 Project List | | 2003 Project List | | 2004 Project List | |
|-------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|--------------------|---------------------------------------|
| | NUMBER OF PROJECTS | INVESTMENT EXPENDITURES (\$ MILLIONS) | NUMBER OF PROJECTS | INVESTMENT EXPENDITURES (\$ MILLIONS) | NUMBER OF PROJECTS | INVESTMENT EXPENDITURES (\$ MILLIONS) |
| Mining excluding Oil & Gas | 1 | \$30 | 1 | \$30 | 2 | \$39 |
| Oil, Gas & Oilsands | 64 | \$49,840 | 48 | \$52,401 | 56 | \$51,409 |
| Forest Products | 6 | \$451 | 4 | \$170 | 5 | \$431 |
| Chemicals | 2 | \$260 | 2 | \$46 | 3 | \$38 |
| Other Manufacturing | 37 | \$680 | 27 | \$290 | 27 | \$295 |
| Pipelines | 10 | \$2,710 | 11 | \$2,369 | 23 | \$1,577 |
| Other Commercial | 289 | \$13,937 | 226 | \$12,057 | 283 | \$13,613 |
| Infrastructure & Institutions | 370 | \$9,813 | 290 | \$10,087 | 410 | \$12,553 |
| TOTAL | 779 | \$77,721 | 609 | \$77,450 | 809 | \$79,955 |

SOURCE: CWDFC

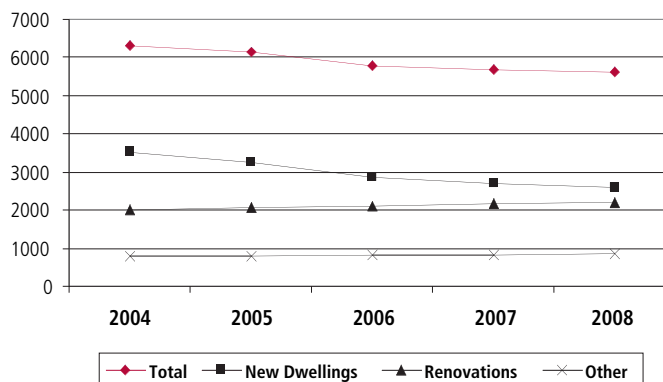
Residential Construction

After a very strong performance over the past few years, residential construction expenditures are expected to decline to 2008 as interest rates rise and population growth slows—see Figure 2. Housing starts are predicted to fall from about 32 thousand in 2004 to below 24 thousand in 2008. Renovation expenditures, nevertheless, continue to rise over the period, but at a somewhat slower rate than over the past few years. Other expenditures, which are largely acquisition costs, register slow growth to 2008.

Non-Residential Construction

Non-residential construction investment is predicted to rise quite rapidly to 2006 and then decline in 2007 and 2008. Engineering construction, which is dominated by oil, gas, and oilsands investment, is largely responsible for both the rapid increase and decline in expenditures. Building construction demonstrates less rapid growth, but growth remains positive to 2008. Industrial building construction, which includes construction in the agriculture, manufacturing, and transportation and warehousing industries, registers the most rapid growth among the categories of building construction. Commercial, institutional and government building construction show relatively slow growth over the period.

FIGURE 2
Residential Construction Expenditures (\$1997 MILLIONS)



SOURCE: CWDFC

TABLE 3
Non-Residential Construction Expenditures (\$1997 MILLIONS)

| | 2004 | 2005 | 2006 | 2007 | 2008 | |
|---|-------|-------|-------|-------|-------|------|
| Total Non-Residential Construction | 18719 | 20744 | 22247 | 21270 | 20625 | |
| % of Change | | 5.8 | 10.8 | 7.2 | -4.4 | -3.0 |
| Engineering Construction | 16259 | 18236 | 19607 | 18559 | 17911 | |
| % of Change | | 6.2 | 12.2 | 7.5 | -5.3 | -3.5 |
| Building Construction | 2460 | 2508 | 2641 | 2711 | 2714 | |
| % of Change | | 3.3 | 2.0 | 5.3 | 2.7 | 0.1 |
| Industrial Construction | 531 | 608 | 646 | 696 | 697 | |
| % of Change | | 4.0 | 14.5 | 6.2 | 7.7 | 0.2 |
| Commercial Construction | 1014 | 978 | 1019 | 1033 | 1045 | |
| % of Change | | 1.8 | -3.5 | 4.1 | 1.3 | 1.2 |
| Institutional & Government Construction | 1044 | 1050 | 1104 | 1111 | 1100 | |
| % of Change | | 4.1 | 0.6 | 5.1 | 0.6 | -1.0 |

SOURCE: CWDFC



Major Project Trades Requirements

The requirements for trades for major industrial projects included in the CWDFC list valued at \$50 million and over are shown in Table 4. Total trades requirements peak in 2006 at 21 thousand. While this peak number is less than that found in last year's list, the total number of requirements for the period has risen. As a result, while more trades are required, less pressure will be put on the trades labour market in the peak year. Electricians and plumbers and pipefitters continue to be the largest number of workers required for the projects. Oil, gas, and oilsands projects account for the largest amount of these requirements in line with their large share of project investment.

Shutdown Trades Requirements

Estimates of workers required for shutdowns for major facilities are shown in Table 5 on a quarterly basis. They are based on information from the ROSE Committee for 2004 and 2005 that was made available to firms involved in these shutdowns. The latter estimates are grossed up by 30 per cent in an attempt to include shutdowns not covered by the committee. For years after 2005, projections of shutdown requirements are made by adjusting the 2005 numbers forward using projected growth in industrial production.

TABLE 4

Trades Requirements for Major Industrial Projects \$50 Million and Over (THOUSANDS OF WORKERS)

| | 2004 | 2005 | 2006 | 2007 | 2008 |
|------------------------|-------------|-------------|-------------|-------------|-------------|
| Boilermakers | 0.4 | 0.6 | 0.5 | 0.3 | 0.1 |
| Bricklayers | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 |
| Carpenters | 1.1 | 1.5 | 1.3 | 1.0 | 0.8 |
| Cement Mason | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |
| Drilling Occupation | 0.4 | 0.3 | 0.3 | 0.2 | 0.2 |
| Electricians | 1.1 | 2.6 | 3.2 | 2.3 | 1.6 |
| Insulators | 0.8 | 1.0 | 1.0 | 0.8 | 0.8 |
| Iron Workers | 1.4 | 1.7 | 1.7 | 1.3 | 1.1 |
| Labourers | 1.5 | 1.7 | 1.6 | 1.4 | 1.1 |
| Millwrights | 0.5 | 0.4 | 0.4 | 0.3 | 0.1 |
| Operating Engineers | 1.6 | 1.9 | 1.9 | 1.6 | 1.2 |
| Other Occupations | 1.7 | 1.9 | 1.9 | 1.7 | 1.1 |
| Plumbers - Pipefitters | 2.4 | 3.2 | 3.3 | 3.1 | 2.4 |
| Sheet Metal Workers | 1.0 | 1.2 | 1.1 | 0.9 | 0.6 |
| Supervisor and Support | 1.5 | 1.6 | 1.6 | 1.4 | 1.0 |
| Welders | 0.7 | 1.0 | 0.8 | 0.6 | 0.3 |
| TOTAL TRADES | 16.6 | 20.8 | 21.1 | 17.1 | 12.5 |

SOURCE: CWDFC

TABLE 5

Major Shutdown Trade Requirements (WORKERS)

| YEAR | 1ST QUARTER | 2ND QUARTER | 3RD QUARTER | 4TH QUARTER |
|------|-------------|-------------|-------------|-------------|
| 2004 | 503 | 4095 | 2210 | 195 |
| 2005 | 845 | 4355 | 4940 | 260 |
| 2006 | 862 | 4442 | 5039 | 265 |
| 2007 | 879 | 4531 | 5140 | 271 |
| 2008 | 901 | 4644 | 5268 | 277 |

SOURCE: ROSE COMMITTEE 2004-2005; CWDFC 2006-2008



Construction Industry Trades Requirements

In addition to requirements for major projects and shutdowns, the construction-related trades are also needed for other construction activity such as residential construction and for projects not announced. Table 6 shows the estimated number of Albertans working in each trade in the construction industry to 2008 along with the corresponding annual growth rate.

For many of the trades, requirements rise rapidly to 2006. They then decline to 2008. These trades are those needed for engineering construction activity such as pipefitters, ironworkers, welders, millwrights, heavy equipment operators, and boilermakers. As was seen above, such activity exhibits relatively strong growth to 2006 and then declines in 2007 and 2008.

For other trades that are more heavily involved in residential construction, such as carpenters, requirements exhibit declines or relatively slow growth. As mentioned above, residential construction investment falls continuously over the 2004 to 2008 period.

Trades Shortage Assessment

The rapid growth in requirements for many of the trades seen in Table 6 suggests a tightening of the demand-supply position for these trades to 2006 with a loosening in 2007 and 2008. For the other trades, an easing in the demand-supply balance would be expected to 2008. The CWDFC assessment of trade shortages is shown in Table 7.

TABLE 6
Construction Industry Trades Requirements (THOUSANDS OF WORKERS)

| | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--|-------|-------|-------|-------|-------|-------|-------|
| Plumbers | 4.37 | 4.51 | 4.56 | 4.69 | 4.81 | 4.72 | 4.68 |
| % of Change | 6.5 | 3.1 | 1.1 | 3.0 | 2.6 | -1.9 | -0.8 |
| Steamfitters, Pipefitters and Sprinkler System Installers | 2.08 | 2.22 | 2.34 | 2.6 | 2.77 | 2.66 | 2.6 |
| % of Change | -0.2 | 7.1 | 5.3 | 11.3 | 6.5 | -4.1 | -2.1 |
| Gas Fitters | 0.15 | 0.16 | 0.17 | 0.2 | 0.21 | 0.2 | 0.2 |
| % of Change | 4.4 | 8.1 | 5.9 | 13.5 | 6.9 | -4.2 | -1.7 |
| Carpenters | 12.98 | 13.05 | 12.85 | 12.83 | 12.74 | 12.5 | 12.38 |
| % of Change | 12.6 | 0.5 | -1.5 | -0.2 | -0.7 | -1.9 | -1.0 |
| Bricklayers | 0.94 | 0.95 | 0.94 | 0.94 | 0.94 | 0.92 | 0.92 |
| % of Change | 11.6 | 0.9 | -1.2 | -0.1 | -0.2 | -1.6 | -0.8 |
| Electricians (except industrial and power system) | 7.11 | 7.37 | 7.5 | 7.76 | 8.02 | 7.88 | 7.82 |
| % of Change | 4.6 | 3.7 | 1.8 | 3.5 | 3.4 | -1.8 | -0.7 |
| Sheet Metal Workers | 1.34 | 1.38 | 1.41 | 1.44 | 1.49 | 1.47 | 1.46 |
| % of Change | 2.0 | 3.6 | 1.8 | 2.1 | 3.5 | -1.2 | -0.5 |
| Boilermakers | 0.22 | 0.24 | 0.25 | 0.29 | 0.31 | 0.3 | 0.29 |
| % of Change | 7.9 | 9.1 | 6.5 | 15.7 | 7.2 | -4.6 | -1.7 |
| Ironworkers | 0.92 | 0.98 | 1.02 | 1.11 | 1.17 | 1.14 | 1.13 |
| % of Change | 2.1 | 6.4 | 4.4 | 8.6 | 5.9 | -2.8 | -1.1 |
| Welders and Related Machine Operators | 2.45 | 2.65 | 2.81 | 3.19 | 3.41 | 3.26 | 3.19 |
| % of Change | 1.6 | 8.1 | 6.0 | 13.5 | 7.1 | -4.5 | -2.1 |
| Construction Millwrights and Industrial Mechanics | 0.61 | 0.66 | 0.71 | 0.82 | 0.87 | 0.83 | 0.82 |
| % of Change | 6.2 | 8.9 | 6.4 | 15.3 | 7.2 | -4.6 | -1.8 |
| Heavy Equipment Operators (except crane) | 6.67 | 7.09 | 7.45 | 8.23 | 8.76 | 8.35 | 8.12 |
| % of Change | -4.2 | 6.4 | 5.0 | 10.5 | 6.4 | -4.6 | -2.8 |
| Crane Operators | 0.71 | 0.76 | 0.79 | 0.86 | 0.92 | 0.89 | 0.87 |
| % of Change | 0.2 | 6.5 | 4.6 | 9.1 | 6.1 | -3.3 | -1.5 |
| Construction Trades Helpers and Labourers | 10.97 | 11.4 | 11.67 | 12.27 | 12.75 | 12.36 | 12.13 |
| % of Change | 0.9 | 3.9 | 2.3 | 5.2 | 3.9 | -3.1 | -1.8 |



TABLE 7
Trades Shortage Rankings

| | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------------------------|------|------|------|------|------|
| Sheet Metal Workers | 4 | 3 | 3 | 4 | 4 |
| Non-Pressure Welders | 4 | 3 | 4 | 4 | 4 |
| Welders – Pressure & Specialty | 3 | 2 | 2 | 3 | 3 |
| Boilermakers | 3 | 2 | 2 | 3 | 3 |
| Millwrights | 3 | 3 | 2 | 2 | 3 |
| Electricians | 3 | 3 | 2 | 3 | 4 |
| Carpenters - Framing | 2 | 3 | 4 | 4 | 4 |
| Carpenters - Scaffolding | 3 | 2 | 2 | 3 | 3 |
| Bricklayers | 3 | 3 | 3 | 4 | 4 |
| Insulators | 4 | 3 | 2 | 3 | 4 |
| Plumbers - Pipefitters | 3 | 2 | 2 | 2 | 3 |
| Ironworkers - Structural | 3 | 2 | 2 | 3 | 3 |
| Ironworkers - Reinforcing | 2 | 2 | 3 | 3 | 4 |
| Operating Engineers | 3 | 2 | 2 | 3 | 3 |
| Labourers | 5 | 4 | 4 | 4 | 5 |

1. A shortage is expected on almost all projects for most of the construction season;
2. A shortage is expected on almost all projects for peak periods of construction;
3. There may be shortages of these workers from time to time as a result of coinciding project schedules;
4. There is a low likelihood of there being a shortage of workers in the base case scenario but some shortages could happen in the high case scenario;
5. Shortages are not likely to occur for this trade.

Conclusion

Last year's forecast suggested we may have seen the peak of industrial construction levels in 2002. It now appears that we may again see levels of industrial construction in 2005 and 2006 approaching those experienced in 2001 and 2002. This forecast assumes that almost all of the projects which have been announced and approved proceed roughly as scheduled. In fact the forecast is contemplating that some of them will necessarily be extended or delayed due to worker shortages and other issues related to the capacity of the industry to handle all of the projected industrial work along with high levels of projected shutdown maintenance work in 2005 and 2006.

Previous forecasts have warned that the aging of our construction workforce will become more of an issue in many trades. By the end of this forecast period (2007, 2008) we expect that we will see a large percentage of experienced tradesmen, either leaving the trades, or changing the way they participate in the industry. They will be more inclined to look for maintenance work or other jobs which don't involve leaving home for extended periods of time or working long hours. Fortunately we have been training record numbers of apprentices for the last few years, many of whom will soon become journey persons. Hopefully our brief downturn in industrial project work last year and this year has not discouraged too many apprentices from continuing to pursue a career in the trades. This underlines the importance of major projects continuing to encourage contractors to employ high levels of apprentices.

Our supply of workers during peak periods continues to be largely dependent upon workers from other provinces choosing to come to work in Alberta. With the Olympic Games coming to B.C. we expect fewer workers from that province will be willing to come here. However B.C. still does not have any large industrial projects on the horizon, which leads us to believe that industrial trades such as pressure welders, pipefitters, and boilermakers will continue to look to Alberta for work. We hope to soon have a much better idea of worker availability in other provinces once the Construction Sector Council have developed their forecasts for other provinces. They are modeling their forecasting process on what has been developed in Alberta and we expect it to provide us with much better data on worker supply than we have had in the past.

We continue to encourage the industry to pursue best practices that improve the effective utilization of our existing workforce, as well as those aimed at attracting young people to the industry. We would also suggest that the industry more aggressively pursue non-traditional sources of workers such as aboriginals and women. While we see significant challenges ahead in terms of worker supply, continued participation in the development of Construction Best Practices has provided the Alberta Construction Industry with a unique and effective framework to manage these challenges.