

## Calgary Economic Development

### INDUSTRY REPORT: CONSTRUCTION

January 2008

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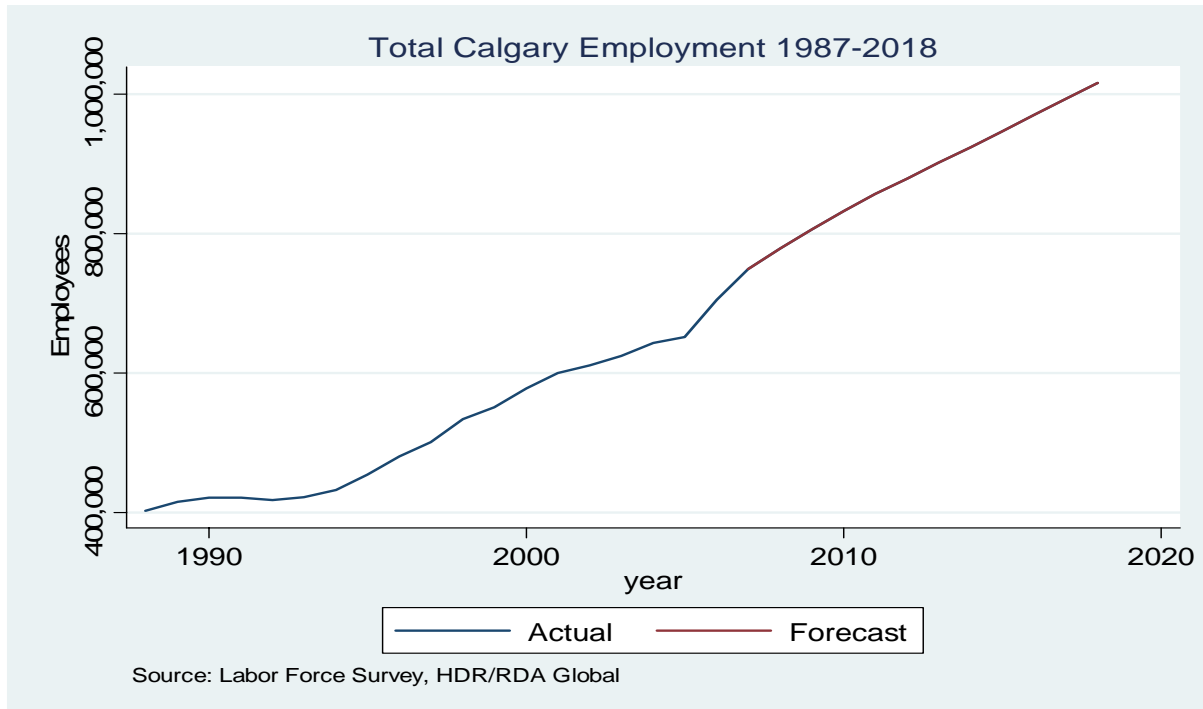


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## CALGARY LABOR MARKET

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Figure 1: Total Calgary Employment Forecast (All Industries)



The Calgary economy has seen tremendous growth in labour demand over the previous decade with employment growth reaching an all-time high of 8.1%<sup>1</sup> in 2006. The recent strong growth in the Calgary economy has been driven by a combination of economic factors spurring growth in specific sectors and generally throughout the Calgary economy. Energy prices are a significant driver with West Texas Intermediate oil price rising 17%<sup>2</sup> in 2006. Investment levels in major construction projects have risen significantly compared to historical levels. Housing starts have risen from 13,700<sup>3</sup> starts in 2005 to 17,000 starts in 2006, an increase of 25%. Calgary GDP grew at 7.7% in 2006.

Recent increases in employment levels have been highest in sectors of the Calgary economy which are related to energy, in particular in the professional services sector. However, overall growth has been relatively balanced among industries with significant growth in most industries of the economy.

As Figure 1 shows, labour demand in the Calgary Economic Region is expected to continue to grow at a healthy rate throughout the forecast, albeit at a lower, more sustainable level. The overall growth in employment in Calgary is expected to decline over the next several years settling at a more sustainable long-term employment growth rate of 2.4%, in line with historical average growth. However, this lower growth rate will continue to result in strong job creation. Over the previous ten years (1996-2006) Calgary employment increased adding 224,000 new

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<sup>1</sup> Source: Labor Force Survey

<sup>2</sup> Source: US Energy Information Administration

<sup>3</sup> Source for housing starts statistics and Metro GDP at basic prices was the Conference Board of Canada

jobs. Over the ten year forecast period (2007-2017) Calgary employment growth will result in the creation of an additional 244,000 new jobs. This growth in the Calgary economy will be driven by a number of factors including expectations that oil prices will remain at or near historically high levels. Energy prices are expected to be volatile in the near term, with possible spikes in prices, partially due to the declining value of the US dollar. However, for the long-term forecast, an average annual 1.7% growth rate in oil prices has been forecasted, which is consistent with conservative expectations of energy analysts<sup>4</sup>. Calgary GDP growth will moderate to a strong long term compound annual real growth rate of 3.8%.

**Figure 2 Calgary Job Creation in Each Industry**

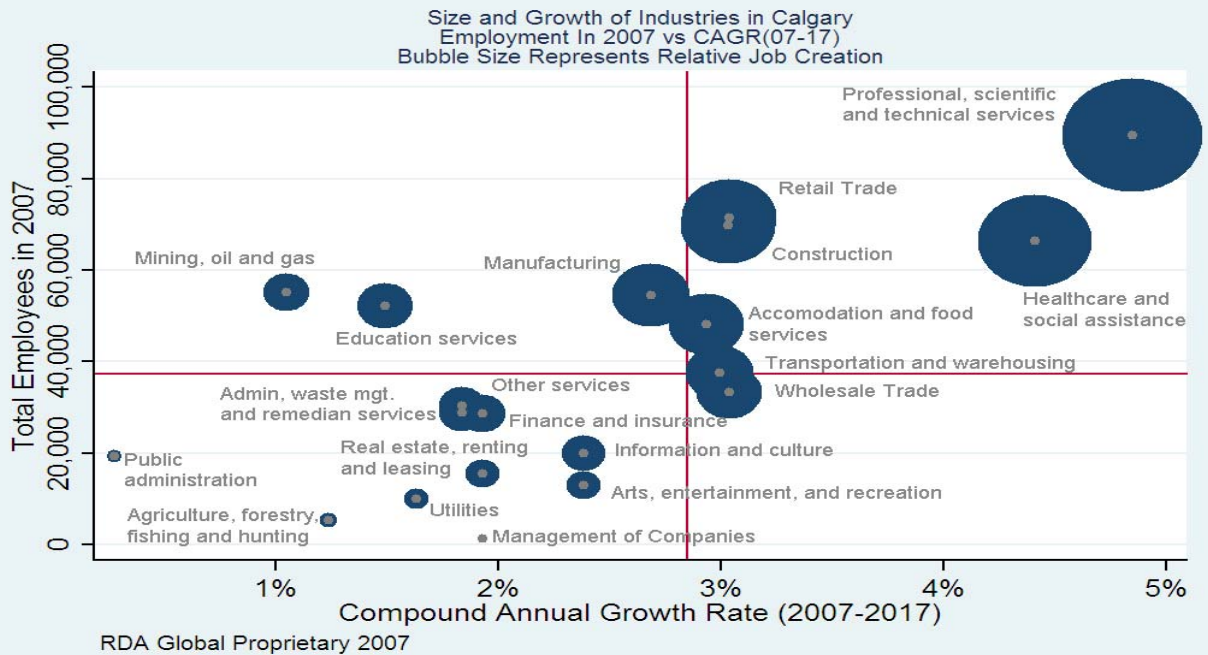


Figure 2 highlights the differences in job creation across industries in Calgary, with the larger circles representing industries with more job creations. Significant gains in employment will be somewhat distributed among economic industries. However, there will be particularly strong expansion in the professional services sector, which is tied to continued demand for technical and engineering services in the energy sector. There will also be strong job growth in healthcare, driven by overall population growth and growth in the older segments of the population. Job expansion will also continue to be robust in retail, construction, accommodation & food services, transportation, manufacturing, and wholesale. Population growth is expected to drive up demand for education services. Most segments of the economy are expected to continue to see positive growth with employment growth rates in the 1% to 2.5% long-term growth range. However, total job creation in niche industries will be constrained by the relatively smaller size of these segments.

<sup>4</sup> In development of this forecast, oil price forecasts of the Energy Information Administration and Sproule and Associates were consulted, however, final assumptions in the forecast model were based on a nominal annual growth rate of 1.7%.

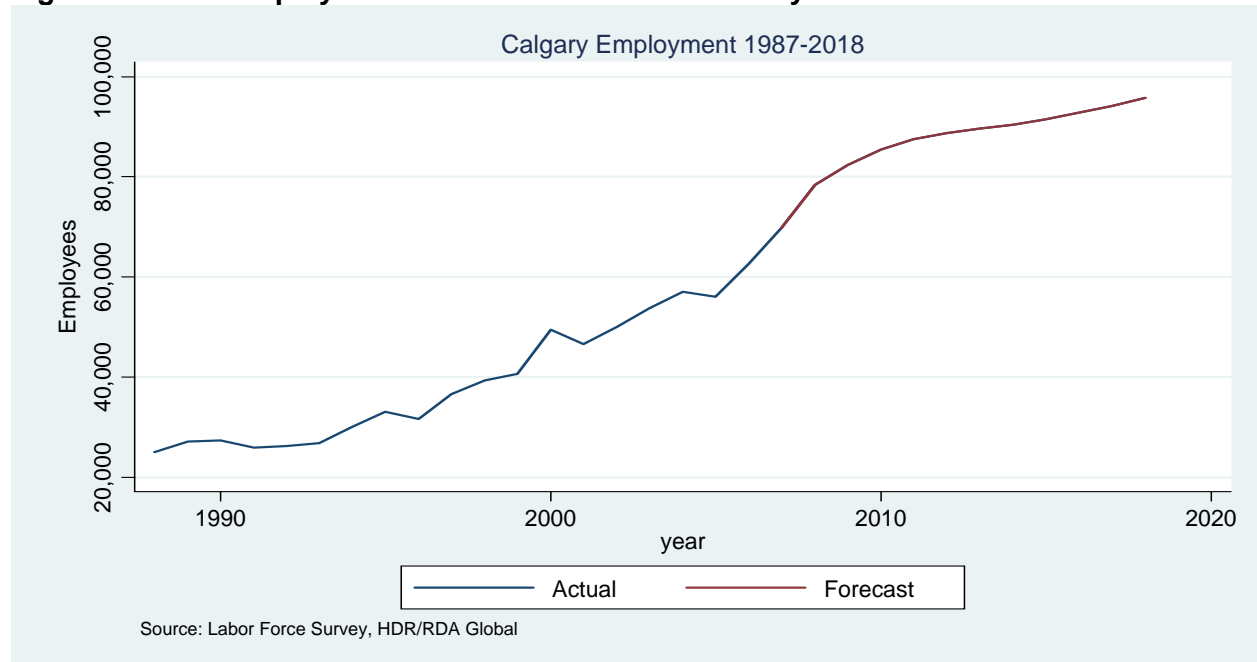
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## CONSTRUCTION INDUSTRY

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The Construction industry is expected to continue to expand at a compound annual growth rate of 3.0% over the next ten years. This will grow in step with the overall employment growth in Calgary of 2.9% over the same forecast period. Growth in the industry will result in an additional 24,300 jobs added to the industry over the forecast period.

**Figure 3: Total Employment in the Construction Industry 1987-2018**



The Construction industry ranks third out of twenty industries for total employment, employing about 69,800 workers today. Historically, growth in this industry has outpaced that of the region and will match the overall regional growth during the forecast period. In terms of jobs created, the industry ranked second over the 1997-2007 period, creating about 33,200 jobs. The industry will be the fourth largest contributor to job creation in the 2007-2017 forecast period, creating nearly 24,300 new jobs. One in every ten new jobs created in the next ten years will be in the construction industry.

**Table 1: Construction Industry Compared with Other Industries**

NAICS Industry	Total Employment				Compound Annual Growth			Jobs Added		
	1987	1997	2007	2017	1987-97	1997-07	2007-17	1987-97	1997-07	2007-17
11 Agriculture, forestry, fishing and hunting	10,357	8,230	5,262	5,951	-2.3%	-4.4%	1.2%	(2,127)	(2,968)	689
21 Mining and oil and gas extraction	34,043	32,970	55,092	61,154	-0.3%	5.3%	1.0%	(1,073)	22,122	6,062
22 Utilities	4,700	3,800	9,881	11,621	-2.1%	10.0%	1.6%	(900)	6,081	1,740
<b>23 Construction</b>	<b>21,500</b>	<b>36,600</b>	<b>69,847</b>	<b>94,177</b>	<b>5.5%</b>	<b>6.7%</b>	<b>3.0%</b>	<b>15,100</b>	<b>33,247</b>	<b>24,331</b>
31-33 Manufacturing	30,500	42,900	54,380	70,890	3.5%	2.4%	2.7%	12,400	11,480	16,510
41 Wholesale trade	21,375	22,041	33,228	44,815	0.3%	4.2%	3.0%	666	11,187	11,586
44-45 Retail trade	46,025	47,459	71,546	96,493	0.3%	4.2%	3.0%	1,434	24,087	24,948
48-49 Transportation and warehousing	21,300	30,400	37,452	50,295	3.6%	2.1%	3.0%	9,100	7,052	12,844
51 Information and cultural industries	11,317	16,489	19,961	25,271	3.8%	1.9%	2.4%	5,172	3,472	5,310
52 Finance and insurance	16,662	21,266	28,538	34,543	2.5%	3.0%	1.9%	4,603	7,272	6,006
53 Real estate and rental and leasing	9,038	11,534	15,479	18,736	2.5%	3.0%	1.9%	2,497	3,944	3,258
54 Professional, scientific and technical services	27,200	43,700	89,591	143,873	4.9%	7.4%	4.9%	16,500	45,891	54,282
55 Management of companies and enterprises	501	879	1,169	1,415	5.8%	2.9%	1.9%	378	289	246
56 Admin & support, waste mgmt & remediation svcs.	11,299	19,821	28,790	34,543	5.8%	3.8%	1.8%	8,522	8,969	5,753
61 Educational services	23,800	31,900	52,154	60,488	3.0%	5.0%	1.5%	8,100	20,254	8,334
62 Health care and social assistance	33,700	43,200	66,471	102,326	2.5%	4.4%	4.4%	9,500	23,271	35,855
71 Arts, entertainment and recreation	7,283	10,611	12,845	16,262	3.8%	1.9%	2.4%	3,328	2,234	3,417
72 Accommodation and food services	20,200	32,100	48,100	64,248	4.7%	4.1%	2.9%	11,900	16,000	16,148
81 Other services (except public administration)	17,800	21,900	30,408	36,484	2.1%	3.3%	1.8%	4,100	8,508	6,076
91 Public administration	21,200	22,900	19,176	19,712	0.8%	-1.8%	0.3%	1,700	(3,724)	536
<b>Grand Total</b>	<b>389,800</b>	<b>500,700</b>	<b>749,368</b>	<b>993,298</b>	<b>2.5%</b>	<b>4.1%</b>	<b>2.9%</b>	<b>110,900</b>	<b>248,668</b>	<b>243,930</b>

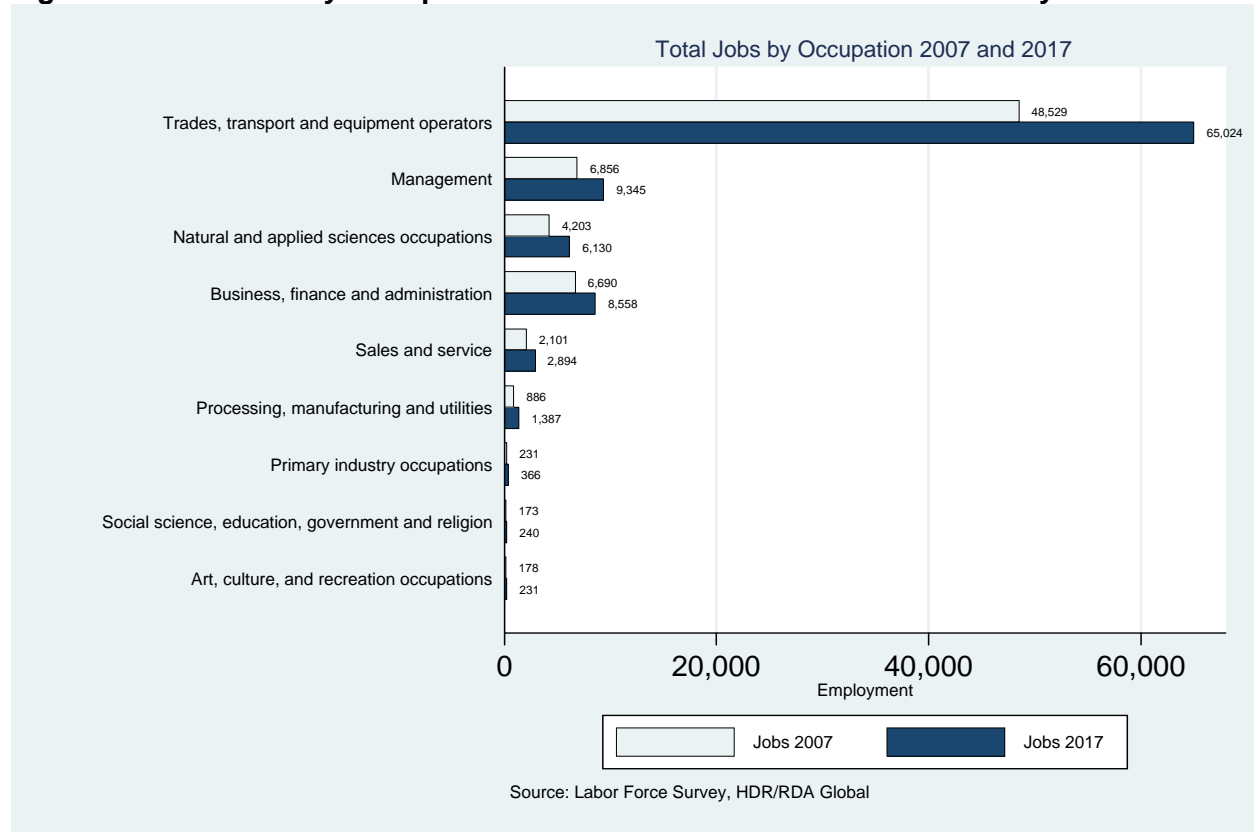
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## JOBS CREATED BY OCCUPATION – CONSTRUCTION INDUSTRY

**Figure 4: Total Jobs by Occupation 2007 and 2017 – Construction Industry**

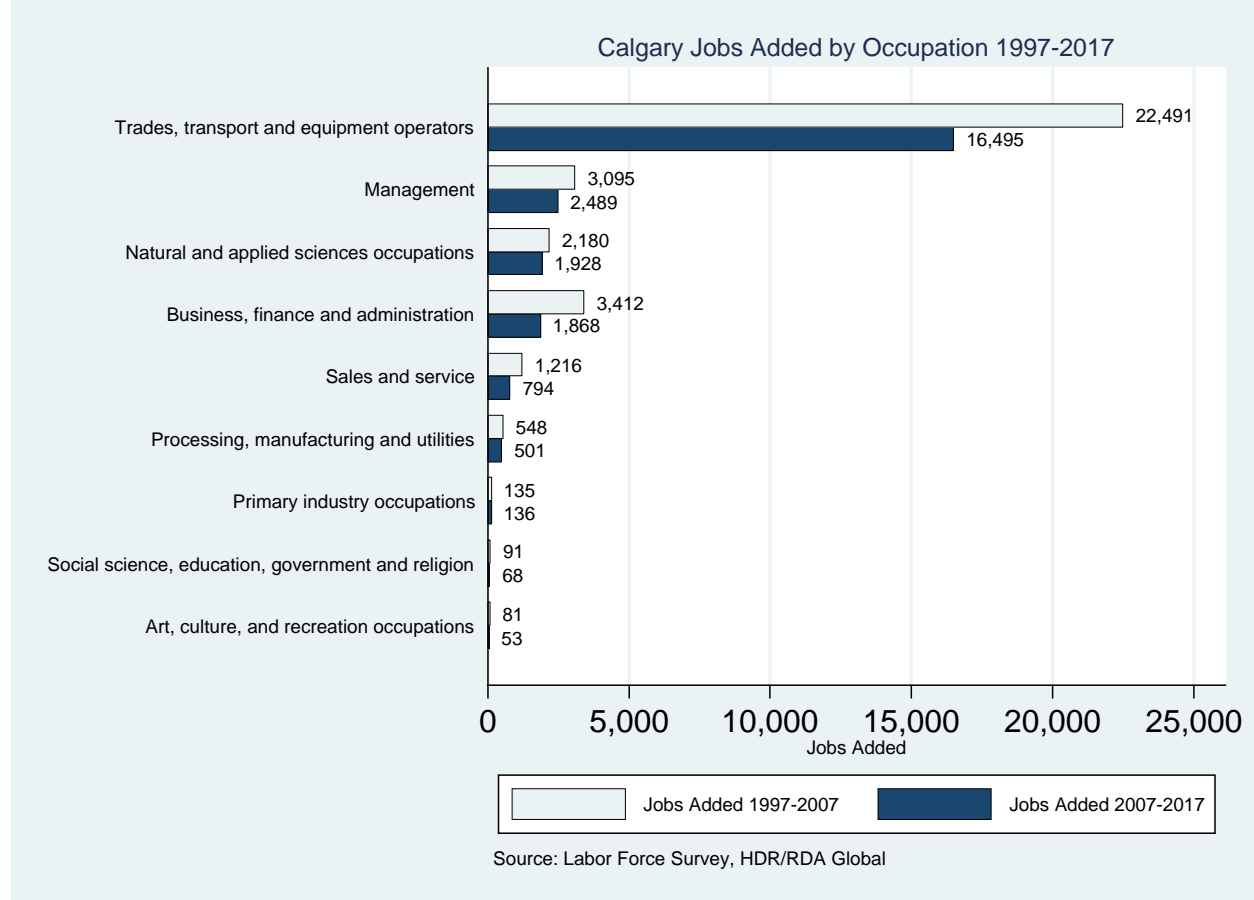


**Table 2: 30-Year Occupational Growth for the Construction Industry**

Occupation (1 Digit NOC)	Total Employees				Compound Annual Growth		
	1987	1997	2007	2017	1987-97	1997-07	2007-17
A Management occupations	1,846	3,761	6,856	9,345	4.2%	7.4%	2.5%
B Business, finance and administration occupations	2,172	3,279	6,690	8,558	4.2%	7.4%	2.5%
C Natural and applied sciences and related occupations	1,128	2,023	4,203	6,130	6.0%	7.6%	3.8%
E Occupations in social science, education, government service and religion	42	82	173	240	7.0%	7.7%	3.4%
F Occupations in art, culture, recreation and sport	57	98	178	231	5.5%	6.2%	2.6%
G Sales and service occupations	520	885	2,101	2,894	5.5%	9.0%	3.3%
H Trades, transport and equipment operators and related occupations	15,489	26,038	48,529	65,024	5.3%	6.4%	3.0%
I Occupations unique to primary industry	32	95	231	366	11.7%	9.2%	4.7%
J Occupations unique to processing, manufacturing and utilities	215	338	886	1,387	4.6%	10.1%	4.6%
<b>Grand Total</b>	<b>21,500</b>	<b>36,600</b>	<b>69,847</b>	<b>94,177</b>	<b>5.5%</b>	<b>6.7%</b>	<b>3.0%</b>

There are nearly 70,000 employees in the Construction industry today. About 48,500 of these workers have trades occupations or work as transport and equipment operators, representing the largest share of occupations. Demand for these jobs will rise to over 65,000 workers over the forecast period. The next largest occupational category is management jobs, which currently employ about 6,900 workers and will employ about 9,400 workers in 2017. Business, finance, and administration occupations are the third largest category with nearly 6,700 employees today growing to about 8,600 workers in 2017.

**Figure 5: Jobs Added in the Construction Industry by Occupation**



Nearly 2/3 of all jobs created in this industry will be trades, transport and equipment operators and related occupations, a total of about 16,500 new jobs by 2017. The industry will generate over 2,500 new management jobs and about 1,900 jobs for workers in natural and applied sciences occupations.

**Table 3: Ten-Year Forecast of Jobs by Major Occupational Group – Construction Industry**

Occupation (1)	Annual Employment
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<b>Digit NOC)</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
A Management occupations	6,105	6,856	7,708	8,120	8,453	8,686	8,820	8,902	8,986	9,093	9,212	9,345
B Business, finance and administration occupations	5,892	6,690	7,866	8,278	8,584	8,727	8,735	8,657	8,588	8,555	8,546	8,558
C Natural and applied sciences and related occupations	3,977	4,203	4,911	5,268	5,432	5,519	5,637	5,728	5,787	5,869	5,991	6,130
E Occupations in social science, education, government service and religion	155	173	200	209	217	222	225	227	228	232	236	240
F Occupations in art, culture, recreation and sport	158	178	188	203	204	211	211	214	216	220	225	231
G Sales and service occupations	1,830	2,101	2,474	2,548	2,678	2,757	2,785	2,777	2,792	2,819	2,854	2,894
H Trades, transport and equipment operators and related occupations	43,620	48,529	53,747	56,323	58,352	59,839	60,759	61,430	62,148	63,012	63,976	65,024
I Occupations unique to primary industry	215	231	273	295	314	327	335	340	345	351	358	366
J Occupations unique to processing, manufacturing and utilities	749	886	1,043	1,130	1,196	1,241	1,267	1,285	1,304	1,329	1,356	1,387
<b>Grand Total</b>	<b>62,700</b>	<b>69,847</b>	<b>78,409</b>	<b>82,375</b>	<b>85,430</b>	<b>87,529</b>	<b>88,776</b>	<b>89,560</b>	<b>90,395</b>	<b>91,479</b>	<b>92,754</b>	<b>94,177</b>

**Table 4: Top 50 Occupations Adding Jobs From 2007-2017<sup>5</sup>**

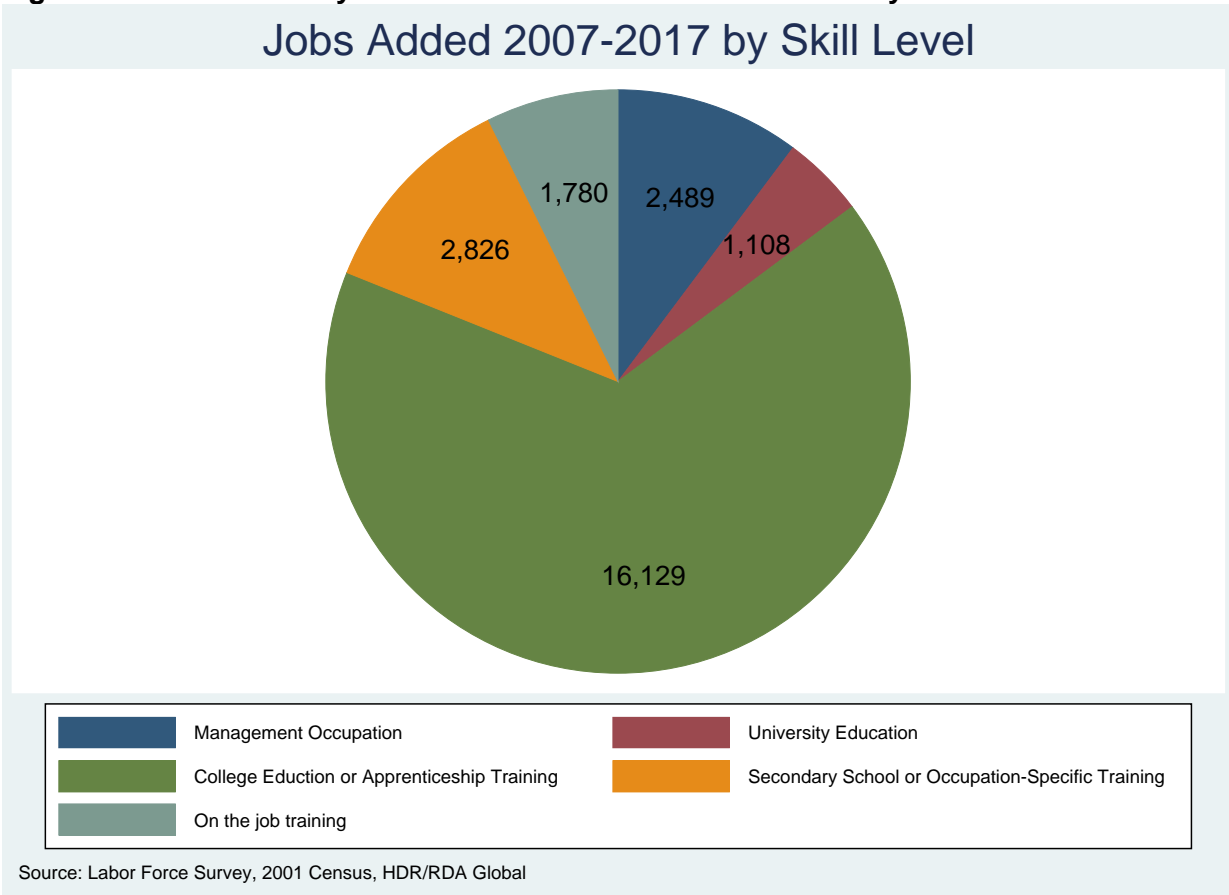
Rank	Occupation (4 Digit NOC)	Employees				Jobs Created
		1987	1997	2007	2017	2007-2017
1	H121 Carpenters	2,057	3,554	6,322	8,407	2,085
2	H211 Electricians (except industrial and power system)	1,374	2,221	4,558	6,092	1,534
3	H821 Construction trades helpers and labourers	1,335	3,043	4,394	5,869	1,475
4	A371 Construction managers	1,080	2,227	4,020	5,423	1,403
5	H144 Painters and decorators	1,011	1,787	3,149	4,182	1,032
6	H111 Plumbers	934	1,653	2,915	3,903	988
7	H019 Contractors and supervisors, other construction trades, installers, repairers and servicers	861	1,177	2,641	3,510	870
8	H017 Contractors and supervisors, heavy construction equipment crews	817	1,087	2,519	3,387	868
9	H134 Plasterers, drywall installers, finishers and lathers	691	1,218	2,144	2,838	694
10	H015 Contractors and supervisors, carpentry trades	704	938	2,120	2,801	681
11	H531 Residential and commercial installers and servicers	405	652	1,347	1,798	450
12	C134 Construction estimators	233	422	866	1,309	443
13	A372 Residential home builders and renovators	341	699	1,253	1,692	440
14	H611 Heavy equipment operators (except crane)	474	746	1,141	1,581	439
15	H012 Contractors and supervisors, electrical trades and telecommunications occupations	344	470	1,053	1,429	376
16	H321 Sheet metal workers	328	531	1,097	1,469	373
17	H145 Floor covering installers	347	613	1,087	1,439	352
18	C031 Civil engineers	214	380	790	1,121	331
19	H326 Welders and related machine operators	222	354	749	1,046	297
20	H413 Refrigeration and air conditioning mechanics	251	407	836	1,115	278
21	B211 Secretaries (except legal and medical)	359	502	919	1,188	269
22	B311 Administrative officers	388	544	996	1,263	267
23	H013 Contractors and supervisors, pipefitting trades	254	348	782	1,040	258
24	G132 Real estate agents and salespersons	116	204	531	764	233
25	H711 Truck drivers	248	388	667	901	233
26	H132 Concrete finishers	227	398	705	935	230
27	H131 Bricklayers	228	400	705	933	229
28	B011 Financial auditors and accountants	182	391	862	1,080	218
29	H141 Roofers and shinglers	216	382	671	889	218
30	B531 Accounting and related clerks	206	319	737	952	216
31	B511 General office clerks	193	297	685	894	210
32	H212 Industrial electricians	156	252	536	740	204
33	J124 Concrete, clay and stone forming operators	89	139	363	562	199
34	G211 Retail salespersons and sales clerks	161	260	576	763	188
35	H143 Insulators	172	302	533	710	177
36	H112 Steamfitters, pipefitters and sprinkler system installers	141	249	453	625	172
37	B111 Bookkeepers	268	376	684	846	163
38	C142 Electronic service technicians (household and business equipment)	73	134	279	441	162
39	H122 Cabinetmakers	139	246	447	604	157
40	H812 Material handlers	127	290	453	607	155
41	A016 Senior managers - Goods production, utilities, transportation and construction	95	153	301	452	151
42	H142 Glaziers	138	244	434	582	149
43	H324 Ironworkers	122	193	402	543	142
44	G111 Sales representatives, wholesale trade (non-technical)	90	163	419	560	140
45	C153 Drafting technologists and technicians	99	176	364	503	139
46	G933 Janitors, caretakers and building superintendents	85	140	291	420	129
47	H133 Tilesetters	122	216	383	509	126
48	H014 Contractors and supervisors, metal forming, shaping and erecting trades	101	138	316	433	116
49	C033 Electrical and electronics engineers	70	126	259	375	116
50	H214 Electrical power line and cable workers	89	139	264	377	113
	Others	2,527	4,313	8,828	12,273	3,445
	Grand Total	21,500	36,600	69,847	94,177	24,331

<sup>5</sup> Note that these job creations in Figure 6 capture only jobs created in the Construction industry and do not represent total job creations for all of Calgary. Jobs with these occupations will also be created in other industries.

## EMPLOYMENT GROWTH BY SKILL LEVEL – CONSTRUCTION INDUSTRY

From a skill level perspective, there will be about 2,500 new management occupations, 16,100 jobs requiring some college education or apprenticeship training, 2,800 jobs which require secondary school or occupation-specific training, 1,100 that require university training and about 1,800 that require only on the job training

**Figure 6: Jobs Added by Skill Level in the Construction Industry**



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## APPENDIX 1: INDUSTRY DEFINITION – CONSTRUCTION

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This industry comprises establishments primarily engaged in constructing, repairing and renovating buildings and engineering works, and in subdividing and developing land. These establishments may operate on their own account or under contract to other establishments or property owners. They may produce complete projects or just parts of projects. Establishments often subcontract some or all of the work involved in a project, or work together in joint ventures. Establishments may produce new construction, or undertake repairs and renovations to existing structures.

A construction establishment may be the only establishment of an enterprise, or one of several establishments of an integrated real estate enterprise engaged in the land assembly, development, financing, building and sale of large projects.

There are substantial differences in the types of equipment, work force skills, and other inputs required by establishments in this industry. To highlight these differences and variations in the underlying production functions, this industry is divided into three subsectors. Establishments are distinguished initially between those that undertake projects that require several different construction activities (known as trades) to be performed, and establishments that specialize in one trade.

The former are classified in Subsectors 236, Construction of Buildings and 237, Heavy and Civil Engineering Construction, depending upon whether they are primarily engaged in the construction of buildings or in heavy construction and civil engineering projects. Establishments in these subsectors complete projects using their own labour force, by subcontracting, usually to trade contractors, or a combination of own account and subcontracting activities. Establishments classified in these subsectors are known by a variety of designations, such as general contractor, design-builder, speculative builder, operative builder and construction manager. The designation depends on the scope of the projects they undertake, the degree of responsibility and risk that they assume, the type of structure that they produce, and whether they work on contract for an owner or on their own account.

General contractors typically work under contract to a client (the owner of the land and the building or structure to be constructed), and undertake projects that require several specialized construction activities to be performed. Often the general contractor will subcontract some of the specialized tasks to other establishments.

Design-builders are similar to general contractors. However, in a design-build project a single contract is signed with the owner that makes the contractor responsible for providing the architectural and engineering designs. The design-builder therefore is responsible for the design of the project as well as its construction.

Construction establishments that build on their own account, for sale to others, are known as speculative builders, operative builders or merchant builders. They are most often engaged in the construction of residential buildings.

Construction managers provide oversight and scheduling services to the owner, for the most part during the actual construction process. This type of service is sometimes referred to as agency construction management, to distinguish it from a type of general contracting known as at-risk construction management. On the other hand, project management, which is a turnkey-

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type service involving the entire project, including feasibility studies, the arranging of financing, and the management of the contract bidding and selection process, is classified in 54133, Engineering Services when it is the primary activity of an establishment.

Establishments that specialize in one particular construction activity, or trade, are generally classified in Subsector 238, Specialty Trade Contractors. However, in order to conform to the generally accepted distinctions made by construction businesses themselves, some types of specialized establishments involved in road building and civil engineering are classified in Subsector 237, Heavy and Civil Engineering Construction.

Subsector 238, Specialty Trade Contractors, comprises establishments engaged in trade activities generally needed in the construction of buildings and structures, such as masonry, painting, or electrical work. Specialty trade contractors usually work under contract to another construction establishment but, especially in renovation and repair construction, they may contract directly with the owner of the property.

A significant amount of construction work is performed by enterprises that are primarily engaged in some business other than construction, for these enterprises' own use, using employees and equipment of the enterprise. This activity is not included in the construction sector unless the construction work performed is the primary activity of a separate establishment of the enterprise. However, if separate establishments do exist, they are classified in the construction sector.

**Exclusion(s):** Establishments primarily engaged in:

- manufacturing and installing building equipment, such as power boilers; manufacturing pre-fabricated buildings (31-33, Manufacturing)
- operating highways, streets and bridges; and house moving (i.e., transportation only) (48-49, Transportation and Warehousing)
- project management services, when it is a primary activity (54133, Engineering Services)
- maintenance of rights of way for power, communication and pipe lines; and cleaning building exteriors, after construction (56, Administrative and Support, Waste Management and Remediation Services)