



Professional Engineers
Ontario

2000

PEO Membership Salary Survey Detailed Report

As of December 1, 2000

Notes:

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FOREWORD

Professional Engineers Ontario has provided members with authoritative and reliable information from its salary survey for approximately 50 years. During this time, the survey methodology and reporting have undergone a number of changes to ensure the quality and usefulness of the data are the best that can be obtained.

In 1996, PEO members endorsed a proposal to change this survey from an annual to a biennial frequency. Consequently, the *PEO Membership Salary Survey* was not conducted in 1997 or 1999. The percentage increases which are presented throughout this report are not annual increases—instead they represent the two-year change in median statistics since the last membership survey in 1998.

Introduced into this year's survey were internet access options for both respondents' data submissions and the detailed reporting of aggregate results. A four-page summary report was printed and distributed to all PEO members through the association's magazine *Engineering Dimensions* in March 2001. This Detailed Report, which is 16 pages cover-to-cover, is being distributed primarily through the PEO website. Copies can also be requested by contacting PEO's Publications Desk.

To gain full benefit from this survey report, it is recommended that members read through each section before attempting to locate themselves on a particular salary level in a given table.

The membership survey results complement the *Report of Engineers' Salaries—Survey of Employers*, which is conducted annually in June. In comparing the results of the *Survey of Members* with the *Survey of Employers*, some key differences should be kept in mind. First, the surveys are conducted six months apart. Second, the *Survey of Members* includes teachers, professors and senior executives who are not represented in the *Survey of Employers*. Third, the *Survey of Members* also reports on PEO members who work in non-engineering jobs.

If you have any comments, questions or wish to request a customized report, please contact :

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INTRODUCTION

This report presents the findings of the 46th Salary Survey of PEO active members and engineers-in-training (EITs) residing in Ontario.

The purpose of the survey is to provide information on basic salaries and total cash compensation earned by PEO members employed in full-time positions. The survey also shows how such factors as geography, industry sector and responsibility level influence engineers' incomes.

Trends in compensation and in the demographics of association membership are shown by comparing the results with those of previous survey years.

Many factors influence engineers' incomes. Two of the most frequently used determinants, year of (bachelor degree) graduation and responsibility level, are insufficient in themselves to explain all of the differences in salaries. Other factors such as industry sector, which is more susceptible to marketplace conditions, and different corporate compensation policies, have obvious but less quantifiable effects on salary rates.

Pages 9 and 10 of this report provide a detailed comparative analysis of salaries for male and female engineers and EITs graduating from 1978 to 1999. Two graphs are presented on page 11 related to total cash compensation. Also included in this report is a profile of the demographics and compensation averages of self-employed PEO members.

PEO's *Classification Guide of Engineering Responsibility Levels* – defining Levels A through Beyond Level F – is posted on PEO's website.

To access all web-based
PEO Salary Survey reports and guidelines

www.peo.on.ca

then use the Navigational Menus to select

“Engineering Practice / PEO Salary Surveys”

METHOD

The Membership Salary Survey was based on active PEO members and engineers-in-training (EITs) residing in Ontario. Retired members were not included. Questionnaires were sent to 100% of the total active PEO membership. Members were given the option of responding either through a custom-built website or through a postage-paid return mail option.

The sample size of 48,780 produced 8,275 valid returns, for a response rate of 17%. Women comprised 8.3% of the survey respondents. Of the total returns, 7,535 (91%) were from members employed in full-time positions – either permanent or contract. The majority of these respondents (7,503) provided salary compensation data.

Surveys from part-time (e.g. fewer than 30 hours per week) and self-employed members are not included in this report – the only exception is Table 8 which examines compensation statistics for self-employed PEO members.

Not every participant answered all the survey questions. Returns were included if respondents provided sufficient data to be included in at least one of the salary tables.

Definitions/Data Interpretation

Salaries as defined in this report constitute annual base salaries paid as of December 1, 2000 to full-time employees who work at least 30 hours per week. “Annual Base Salary” statistics do NOT include bonuses, commissions, profit sharing or overtime. Tables and figures reporting “Total Cash Compensation” (Tables 7 & 8 and Figures 5 & 6) do include the previously mentioned pay components.

Number of engineers (#) refers to the usable number of responses from which the statistics were derived for the data line in question. Table counts may not equal the total responses (7,503) where the “Not Reported” category is not shown. For the same reason, and due to rounding, percentages may not add up to exactly 100%.

The average salary refers to the **mean** or numerical average. The median, quartiles and deciles are measure of dispersion and are defined below.

Low Decile: 90% of the salaries were above this point and 10% were below it.

Low Quartile: 75% of the salaries were above this point and 25% were below it.

Median: the mid-point, 50% above and 50% below.

High Quartile: 25% of the salaries were above this point and 75% were below it.

High Decile: 10% of the salaries were above this point and 90% were below it.

When the sample size is small, greater consideration should be given to **median** values rather than **mean** averages for comparison purposes. This is because **medians** are less influenced by a few very high or low salaries.

The percentage increase column that appears in most tables indicates the change in the **median** salary compared to the last survey conducted, dated December 1, 1998. Sampling differences have some effect on these percentages.

RESULTS

Demographics

The survey results were obtained by sampling 100% of the active association membership in Ontario. The response rate of 17% provided a solid number of returns. The demographics of the sample closely match those from previous surveys and the PEO membership in general.

Since 1994, the survey has not included members classified as retired. Consequently the data reported in Table 1. Respondents' Employment Status will show significant jumps from 1993 for some data lines reported. In 1996, full-time employees were asked to indicate whether their positions were permanent or contract.

The percentage of PEO members working full-time is 91%. Seven percent of Ontario's professional engineers are self-employed. Unemployment has dropped to less than one percent – this is the lowest rate reported in the past twelve years. The "Other" category includes semi-retired and members on parental leave or permanent disability.

The average age for all full-time engineers was calculated to be 42 years-old (as of December 1, 2000). The average age for female engineers employed full-time was 34, for male engineers 42.

Almost one-third of the respondents have postgraduate degrees. Nineteen percent have a MASC, MEng or MESC degree. Over seven percent have earned an MBA. Five percent have attained a PhD in engineering and 3% have other types of postgraduate degrees.

Approximately half (48%) of the sample work in the Greater Toronto area and over one-fifth are in Southwestern Ontario.

As represented in Figure 1, the distribution percentages for male and female engineers by major industry sector differed slightly. Working full-time in manufacturing was reported by 46% of males and 44% of females. Female engineers were more likely to work in consulting and non-manufacturing than their male counterparts.

Table 1. Respondents' Employment Status Over 10 Survey Years (%)

	2000	1998	1996	1995	1994	1993	1992	1991	1990	1989
Full-time (permanent)	89.2	85.4	86.0	88.7	86.9	77.5	79.0	80.8	83.3	81.8
Full-time (contract, temporary)	1.8	2.6	3.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Self-employed	7.0	7.9	6.9	7.2	6.5	5.8	4.9	5.0	4.4	5.0
Unemployed	0.6	1.0	1.4	1.8	1.9	2.7	2.5	1.8	0.9	0.7
Part-time	0.5	0.8	0.8	0.7	0.9	0.8	0.9	0.7	0.8	0.5
Student	0.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other	0.6	2.2	1.8	1.6	3.8	1.5	1.2	1.2	0.8	0.7
Retired	N/A	N/A	N/A	N/A	N/A	11.6	11	10.3	9.3	11.3

Figure 1. Employment Distribution by Industry and Gender (Full-Time Employment Status)

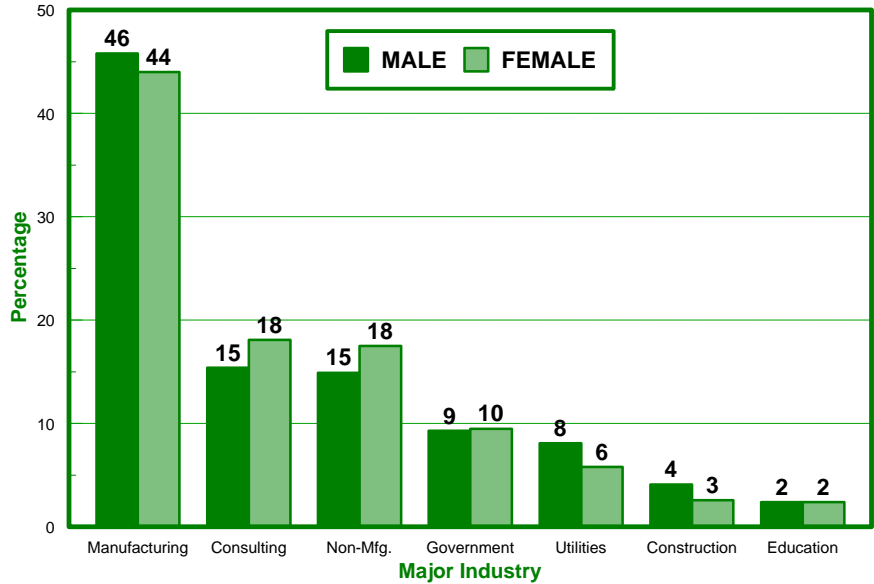


Table 2. Salary Growth & Consumer Price Index, 1989-2000 (Percentage change between survey years)

Survey Year	2000	1998	1996	1995	1994	1993	1992	1991	1990	1989
% Increase in Overall Median Salary	12.8	5.0	0.0	0.0	1.6	0.7	1.7	4.2	3.5	5.5
CPI - Canada (1986 = 100)	4.5	2.5	2.2	2.1	0.3	2.3	1.9	6.7	5.5	5.4

Annual Salaries by Year of Graduation

The median base salary for full-time engineers was \$77,000 as of December 1, 2000. The majority (80%) of PEO members earn an annual base salary between \$53,000 and \$114,000.

This survey year's median is 12.8% higher than the median salary reported in 1998. Over this two-year period, the Consumer Price Index for Canada rose 4.5%.

Engineering graduates from 1990 to 1998 received the largest increases, ranging from 17.7% to 24.5%. Above average increases are usually noted for the more recent graduates, because they are advancing more quickly through their careers to positions of greater responsibility during this period.

The second last data line in Table 3 (No Degree) represents respondents who entered the profession via the exam route. The salary statistics of this group are slightly below the overall earnings. Their reported median of \$75,000 is \$2,000 lower than the overall figure.

The salary data in Table 3 differs from the salaries reported in the June 1, 2000 *Ontario Engineers' Salaries-Survey of Employers*. This past year's employer survey stated the median base salary for all engineering positions was \$74,119. The entry level median salary in the 2000 *PEO Survey of Employers* was \$46,692.

Note: When comparing results from the two PEO salary surveys (Employer versus Membership), keep in mind the sampling differences. The three most important differences are stated in the FOREWORD on page 4.

Table 3. Annual Salaries by Year of Graduation

(Ontario data as of December 1, 2000)

Year of Bachelor Graduation	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr. 1998-2000 Median
All Years	7,503	81,647	53,000	63,000	77,000	92,500	114,000	12.8
2000	6	46,272	42,000	42,500	45,765	48,000	53,600	-
1999	66	47,459	36,000	40,000	46,000	50,000	62,000	-
1998	158	51,749	40,000	45,000	50,000	56,000	65,000	22.0
1997	193	54,686	42,000	47,400	52,250	57,800	69,000	24.4
1996	310	57,150	42,250	48,500	55,000	63,000	73,750	22.2
1995	288	59,934	45,000	50,000	58,500	65,500	75,000	24.5
1994	244	64,429	50,000	54,400	61,000	70,000	85,000	22.0
1993	223	67,227	50,000	59,100	64,000	72,000	81,200	23.1
1992	227	72,533	50,602	59,371	68,500	80,000	98,000	23.2
1991	218	71,967	55,000	60,000	69,398	78,000	92,000	18.6
1990	238	74,575	55,000	64,000	71,000	80,000	97,000	17.7
1989	209	77,845	55,000	65,000	72,500	84,000	100,000	14.4
1988	220	78,696	60,000	66,000	74,500	86,500	101,300	12.9
1987	246	80,941	60,000	66,300	76,338	88,800	104,000	14.4
1986	249	82,296	60,000	67,200	78,000	92,500	114,000	11.4
1985	256	83,439	60,000	69,054	77,894	90,000	110,000	13.7
1984	238	84,408	60,000	68,500	80,970	92,500	116,000	12.5
1983	215	88,000	61,000	72,000	83,000	100,000	122,000	15.8
1982	223	87,324	62,500	70,800	82,715	95,000	121,200	10.3
1981	214	85,127	62,000	70,000	80,000	92,800	116,400	6.7
1980	221	90,553	65,977	74,000	85,130	103,000	120,000	12.2
1979	202	89,302	64,200	73,000	82,000	98,000	125,000	6.2
1978	188	88,830	62,600	75,288	84,150	98,150	115,000	6.0
1977	191	94,223	66,000	74,114	84,780	102,000	120,000	7.3
1976	175	92,896	67,000	73,840	86,000	103,000	126,000	10.3
1975	203	97,911	68,000	78,000	89,000	105,540	140,000	11.3
1974	182	88,918	63,264	75,000	84,600	97,000	115,000	6.6
1973	166	93,967	66,000	79,600	90,000	105,000	124,000	4.7
1972	177	93,999	65,000	75,589	86,818	103,000	120,000	3.4
1971	169	93,277	67,920	78,000	89,000	103,000	126,000	9.4
1970	176	96,775	67,200	76,000	86,256	100,100	130,000	6.1
1969	129	94,288	67,300	80,000	90,000	105,000	125,000	6.1
1968	139	96,508	70,000	79,000	90,000	105,269	129,000	9.0
1967	107	100,965	68,760	79,000	92,000	112,500	147,500	5.4
1966	85	105,472	70,000	86,000	100,000	120,000	150,000	12.3
1965	90	104,284	68,900	78,800	92,334	115,000	150,000	8.6
1964 & Earlier	279	98,101	69,300	80,000	92,000	106,000	130,000	6.5
No Degree	254	77,387	53,000	63,000	75,000	90,000	104,000	5.6
Not Reported	129	85,000	53,000	62,400	71,500	85,000	120,000	2.1

Comparison of Salaries for Male and Female Engineers

The most meaningful way to compare salaries for male and female engineers is to use data from the graduating years where the response is highest and consequently most reliable. Table 4 provides comparative salaries for men and women who graduated from 1978 to 1999.

In this 22-year group, women comprised 11.5% of the overall sample. The **median age** in this cohort group was 32 years for women and 37 years for men.

Education levels (highest degree obtained) were similar for both genders. The base work week was only slightly longer for men (38.7 hours per week versus 38.5 hours for women). The average hours reported for actual work week was higher for men than for women (46.8 versus 45.2).

The median salary for women in this sample was \$62,437, compared to \$72,000 for men in the same graduating years. The difference (\$9,563) represents a 13.3% wage gap for female engineers.

The salary maturity curves in Figure 2 show median salaries for men and women. The median salaries for females exceeded those of males in three graduating years – 1991, 1988 & 1996. In two graduating years (1996 & 1990) medians were equal.

Females who graduated in 1999 receive \$42,000 as a median base salary. This dollar figure is 10.6% lower than the amount earned by males of the same graduating year. Look to the graduation years of 1982 and 1980 in Table 4 to see wage gaps of 15.4% & 11.4% respectively.

The wage gap can be influenced by a number of factors, including industry sector, age and where individuals stand in the organization's hierarchy. A seniority analysis indicates that 55% of males are in the senior responsibility levels (D, E, F and F+) compared to only 36% of females. Refer to Figure 4 on page 9 for a more detailed breakdown of seniority.

When comparing this year's results to previous survey years, it appears the wage gap between male and female engineers is increasing. The 2000 salary survey calculates the wage gap at 13.3%. In the *1998 PEO Survey of Members*, female graduates from a 20-year graduating span (1979 to 1998) reported base salaries that were 11.4% lower in comparison with male counterparts. The 1996 findings reported the gender wage gap to be at 9.3%.

One of the reasons for this increase appears to be the greater age difference in the cohort groups. The age differences per survey have been 1996 (three years), 1998 (four years) and 2000 (five years).

Additional data analysis is included on the opposite page in an attempt to identify other possible contributing factors to the widening wage gap. Please refer to page 9 for the results by responsibility level and major industry sector.

Table 4. Comparison of Salaries for Male and Female Engineers

(Graduating Years 1978 to 1999)

Year of Bachelor Graduation	MALE			FEMALE			Wage Gap Median %
	No. of Engs.	Mean	Median	No. of Engs.	Mean	Median	
1999	51	48,950	47,000	15	42,388	42,000	10.6
1998	114	52,252	50,050	42	49,524	49,400	1.3
1997	145	56,150	54,000	44	49,534	49,664	8.0
1996	259	56,962	55,000	48	58,361	55,000	0.0
1995	238	60,064	59,000	48	59,582	58,000	1.7
1994	203	65,173	61,525	39	60,152	57,000	7.4
1993	192	67,832	65,000	30	62,760	60,500	6.9
1992	200	73,156	69,529	27	67,921	64,200	7.7
1991	191	72,235	69,133	26	70,073	69,500	-0.5
1990	207	74,680	71,000	28	74,312	71,000	0.0
1989	193	78,595	73,000	15	69,048	70,060	4.0
1988	197	78,748	74,000	23	78,252	75,000	-1.4
1987	221	81,959	77,000	23	70,975	70,000	9.1
1986	219	82,276	78,000	29	82,938	78,800	-1.0
1985	234	84,006	78,250	22	77,404	71,000	9.3
1984	215	84,642	81,000	20	80,774	76,500	5.6
1983	194	88,375	83,000	20	84,256	81,100	2.3
1982	205	88,303	84,000	17	74,893	70,625	15.9
1981	206	85,533	80,000	7	76,791	76,000	5.0
1980	207	91,243	85,300	13	79,429	75,540	11.4
1979	191	89,812	82,000	11	80,432	80,000	2.4
1978	174	89,799	85,000	11	77,459	77,000	9.4
OVERALL (78-99)	4,256	76,360	72,000	558	66,270	62,437	13.3

Figure 2. Median Base Salary Statistics by Gender Graduating Years 1978 to 1999



Figures 3 and 4, plus other tables within this report, refer to results by *engineering responsibility level*. The Classification Guide, which defines the seven levels, was not published within this report. There are three easy ways to obtain a copy of the Classification Guide. Using the internet, access the following site: www.peo.on.ca/engpractice/salsurv.html

The second option is to reference the September/October issue of *Engineering Dimensions*, the guide is included with the *2000 PEO Survey of Employers*. Otherwise, call PEO's Publications Desk and a copy will be faxed or mailed to you.

For the graduating years of 1978 to 1999, the median salaries for male and female engineers differed at all responsibility levels. Only in Level A did the median salary for females exceed that of males.

Below are the actual median statistics used in Figure 3. The levels marked (**) have low numbers of female observations (16, 15 & 5 respectively). Results should only be considered as indicators.

LEVEL	Males	Females	Wage Gap
A **	\$ 42,000	\$ 45,000	-7.1%
B	\$ 50,000	\$ 46,650	6.7%
C	\$ 60,180	\$ 57,000	5.3%
D	\$ 72,000	\$ 67,000	6.9%
E	\$ 83,000	\$ 77,500	6.6%
F **	\$ 93,000	\$ 85,000	8.6%
F+ **	\$120,000	\$100,000	16.7%

Figure 4 presents the distribution of the 22-year cohort of recent graduates by responsibility level and gender. As mentioned on page 8, only 36% of females report working in the top four responsibility levels, compared to 55% of males. One factor contributing to this difference is that the selected females were five years younger than the males.

Salary comparisons by major industry sector are presented in Table 5. When comparing median base salaries, the wage gaps were lower in non-manufacturing (\$3,500 or 4.5%), government (\$4,400 or 6.4%) and utilities (\$5,250 or 6.6%).

The largest difference was noted in the construction sector where female engineers reported base salaries that were 27.5% lower than their male co-workers. Women employed full-time by consulting firms earn \$12,249 less than men who work for the same organizations – an 18.6% wage gap.

Examining the *total cash compensation* statistics for this cohort group reveals even larger differences. Male engineers reported total cash earnings of \$79,000 (median). The median figure for female engineers was \$12,800 lower at \$66,200. While the salary wage gap stands at 13.3%, there is a 19.3% gap in total cash compensation.

Figure 3. Median Salaries by Responsibility Level and Gender Graduating Years 1978 to 1999

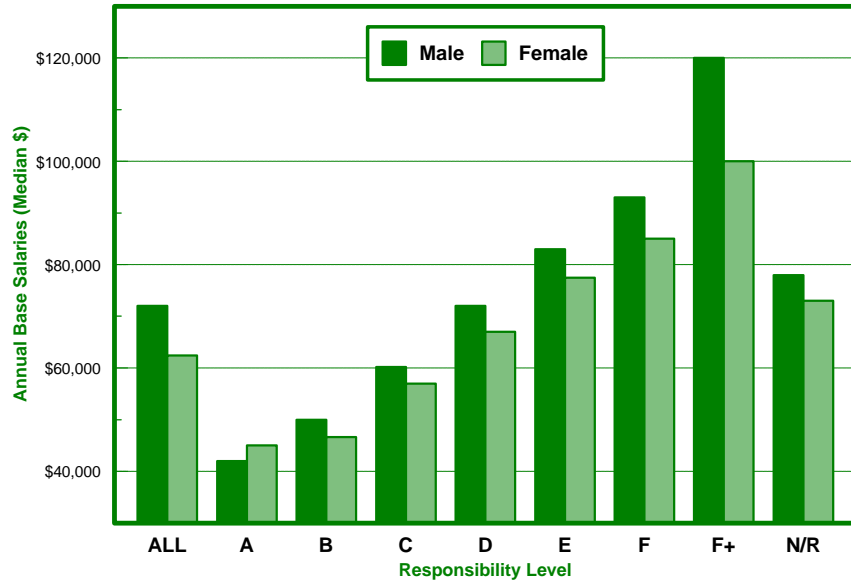


Figure 4. Distribution by Responsibility Level and Gender Graduating Years 1978 to 1999

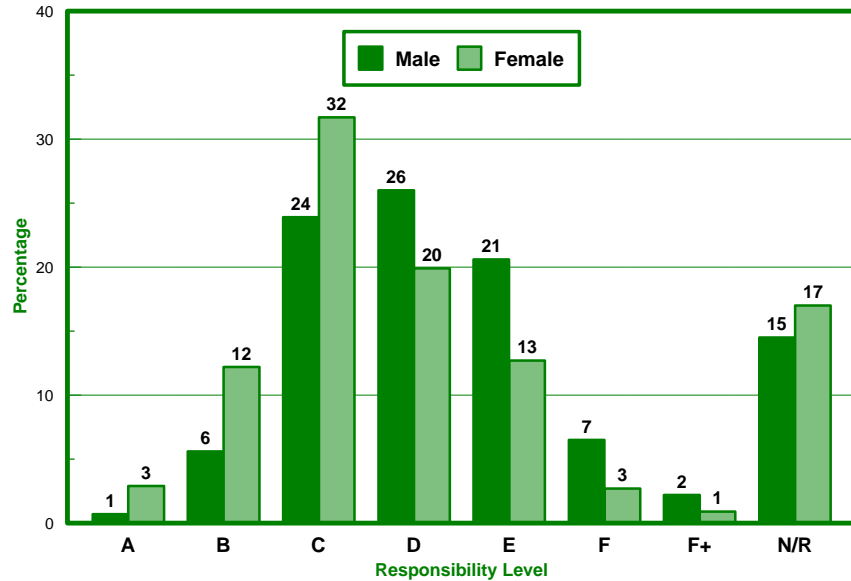


Table 5. Annual Salaries by Major Industry Sector and Gender

(Graduating Years 1978 to 1999)

Major Industry Sector	MALE			FEMALE			Wage Gap Median %
	No. of Engs.	Mean	Median	No. of Engs.	Mean	Median	
Utilities	269	80,126	79,000	32	73,893	73,750	6.6
Non-Manufacturing	662	83,293	78,000	97	76,968	74,500	4.5
Manufacturing	2,155	76,911	72,000	244	66,629	63,500	11.8
Education	81	74,308	71,500	14	63,754	64,500	9.8
Government	252	68,846	69,000	50	65,543	64,600	6.4
Construction	169	71,800	67,200	14	51,400	48,750	27.5
Consulting	625	70,167	66,000	103	56,342	53,751	18.6

Annual Salaries by Responsibility Level

Table 6 reports the salary increases since the 1998 survey according to the seven levels of job responsibility.

Note: The PEO website provides definitions for each of the engineering responsibility levels.

Engineers and EITs in the junior level (Level A) now make a median salary of \$44,000; an 11.4% rise from the 1998 survey findings. The 80% spread from low to high decile is \$35,000 to \$55,000.

The largest median increase is found in Level B. The 1998 base salary of \$43,355 increase by 15.3% in the year 2000.

Level D engineers, who are the first level of sustained supervision over other engineers, reported an increase of 9.4% and now earn \$73,265 as a median base salary.

Engineers working in Level F+ reported a median base salary of \$120,000.

Average Compensation by Pay Component & Responsibility Level

Table 7 states the frequency and mean amounts of additional cash engineers receive to supplement their base salary. While not all engineers receive them, bonuses, profit sharing, commissions and overtime are a growing and significant part of "take home" pay for many.

Using Level C as an example, 37% of the respondents received an average bonus of \$4,154; 24% received \$8,046 in overtime and 20% were paid an average of \$4,512 related to profit sharing, in addition to a base salary of \$62,550. The mean total cash compensation for Level C engineers was \$67,846 or 8.5% above base salary.

Additional cash payments do not include deferred profit sharing plan contributions, car allowances or fringe benefits.

The "Average Total Cash Compensation" figures are weighted averages, since only a portion of respondents at each level report receiving additional cash payments. The weighted average measures the combined effect of the additional cash payments on the overall sample population at each level.

Table 6. Annual Salaries by Responsibility Level

(Comparison December 1, 1998 and December 1, 2000)

Responsibility Level	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile
All Levels Combined							
Dec 2000	7,503	81,647	53,000	63,000	77,000	92,500	114,000
Dec 1998	6,041	72,254	44,000	54,990	68,273	83,400	100,000
% Increase		13.0	20.5	14.6	12.8	10.9	14.0
Level A							
Dec 2000	53	43,958	35,000	38,000	44,000	49,500	55,000
Dec 1998	161	39,139	32,000	35,000	39,500	42,420	45,760
% Increase		12.3	9.4	8.6	11.4	16.7	20.2
Level B							
Dec 2000	333	49,739	38,480	44,000	50,000	55,000	60,000
Dec 1998	473	44,005	35,000	39,000	43,355	48,000	54,000
% Increase		13.0	9.9	12.8	15.3	14.6	11.1
Level C							
Dec 2000	1,423	62,550	48,000	54,000	60,600	69,600	79,848
Dec 1998	1,201	56,731	43,000	48,750	55,000	63,100	72,592
% Increase		10.3	11.6	10.8	10.2	10.3	10.0
Level D							
Dec 2000	1,706	75,269	59,900	65,000	73,265	82,200	92,500
Dec 1998	1,249	68,119	54,000	60,000	67,000	75,000	84,000
% Increase		10.5	10.9	8.3	9.4	9.6	10.1
Level E							
Dec 2000	1,756	87,057	67,500	75,000	85,000	95,000	108,800
Dec 1998	1,270	80,707	65,000	71,000	80,000	88,234	98,970
% Increase		7.9	3.8	5.6	6.3	7.7	9.9
Level F							
Dec 2000	724	101,094	77,000	85,000	97,118	110,000	128,520
Dec 1998	501	91,714	70,000	80,000	90,000	100,000	115,000
% Increase		10.2	10.0	6.3	7.9	10.0	11.8
Level F+							
Dec 2000	344	128,146	85,500	100,000	120,000	145,000	183,000
Dec 1998	256	122,214	82,000	95,000	111,870	140,000	175,000
% Increase		4.9	4.3	5.3	7.3	3.6	4.6
Not Reported							
Dec 2000	1,164	91,186	55,000	68,500	82,316	102,600	135,000
Dec 1998	930	82,176	45,000	57,200	71,000	91,800	120,450
% Increase		11.0	22.2	19.8	15.9	11.8	12.1

Table 7. Average Compensation by Pay Component and Responsibility Level

Component	Level A		Level B		Level C		Level D		Level E		Level F		Level F+		Not Reported	
	#	\$	#	\$	#	\$	#	\$	#	\$	#	\$	#	\$	#	\$
Base Salary	53	43,958	333	49,739	1,423	62,550	1,706	75,269	1,756	87,057	724	101,094	344	128,146	1,164	91,186
Cash Bonus	13	3,754	92	3,041	521	4,154	687	6,304	798	10,815	366	18,542	199	44,770	551	24,859
Profit Share	7	1,254	64	2,360	287	4,512	348	5,718	333	9,147	139	20,795	65	49,552	223	13,432
Commission	2	7844	5	26,781	22	23,904	31	21,067	32	29,432	5	22,500	5	49,800	70	63,064
Overtime **	16	3,290	96	6,081	344	8,046	337	8,664	180	9,950	29	11,263	5	19,200	79	9,242
Consulting Fees					11	14,409	28	7,772	34	13,984	21	13,719	11	19,114	30	35,267
Other	1	3,000	10	4,946	81	9,382	113	21,209	128	24,513	53	107,705	30	68,252	85	24,666
Avg. Total Comp.*	53	46,390	333	53,336	1,425	67,846	1,706	82,601	1,759	97,154	724	123,349	344	170,974	1,173	111,792
Diff. from Base		2,432		3,597		5,296		7,332		10,097		22,255		42,828		20,606
% of Base		5.5		7.2		8.5		9.7		11.6		22.0		33.4		22.6

* Average total compensation is the average total income reported by all respondents, not the sum of averages for each component

** Overtime component includes: Overtime as well as On-Call Pay and Shift Premiums

Additional/Total Cash Compensation

Figure 5 illustrates the benefits of additional cash payments for Ontario engineers. Overall, the mean figure for total cash compensation was \$94,182 (or 15.4% above the base salary of \$ 81,647).

Below is a summary of total cash statistics reported by each responsibility level.

LEVEL	Mean Total Cash Comp.	% Above Mean Base Salary
A	\$ 46,390	5.5 %
B	\$ 53,337	7.2 %
C	\$ 67,845	8.5 %
D	\$ 82,601	9.7 %
E	\$ 97,154	11.6 %
F	\$ 123,349	22.0 %
F+	\$ 170,975	33.4 %
Not Reported	\$ 111,793	22.6 %

Figure 6 plots the median statistics for base salary and total cash compensation according to year of bachelor degree. For 1999 graduates, the median base salary as of December 1, 2000 was \$46,000. Factor in the additional cash payments and their total cash compensation was 7.7% higher at a median of \$49,550. The highest median was calculated for 1966 graduates – \$100,000 for their base salary and \$106,000 in total cash.

Overall, engineers employed full-time reported a median figure of \$83,000 in total cash compensation.

Compensation for Self-Employed Members

This year's survey results indicate that approximately seven percent of PEO's active membership are self-employed.

The following demographic information represents 582 respondents who were self-employed as of December 1, 2000: 98% were male engineers; the average age was 50; 37% had postgraduate degrees; 50% worked in the Toronto area.

Over 7% of male respondents stated they were self-employed, compared to less than 2% of females. The average ages also differ: 51 for men and 41 for women.

Self-employed engineers were most likely to work in the consulting sector (42%). Over 44% reported their work was largely or entirely related to engineering. Fifteen percent stated their work was in no way associated with engineering.

Although 582 PEO members stated they were self-employed, only 555 respondents provided compensation data. Table 8 illustrates the frequency and amounts of cash compensation as of December 1st.

The total average cash income earned was \$124,855; the median compensation was \$100,000. This year's median was much higher than in 1998 (14.2% higher).

When compared to full-timers' total cash compensation, the mean for self-employed members was 33% higher and the median 20% higher.

Figure 5. Base Salary plus Additional Cash Payments by Responsibility Level

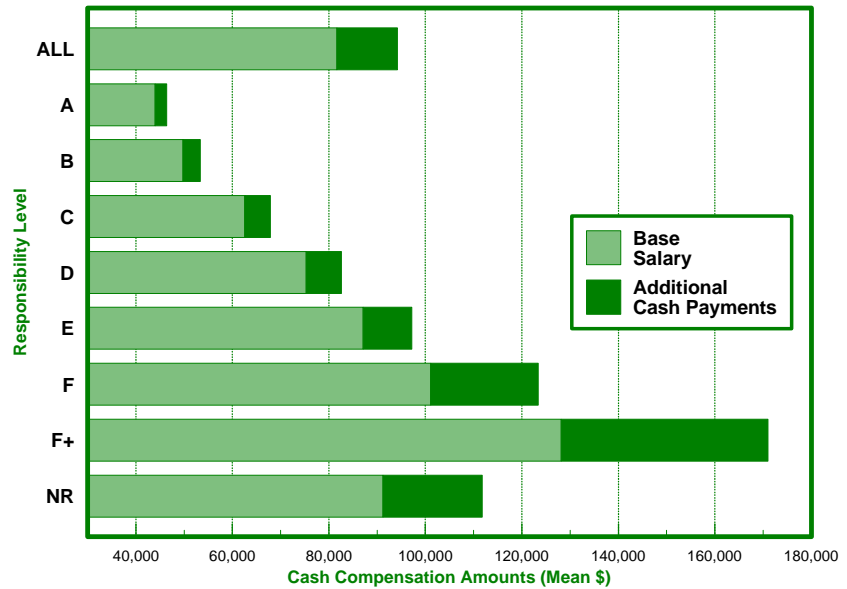


Figure 6. Comparison of Median Salary Statistics Annual Base Salary versus Total Cash Compensation

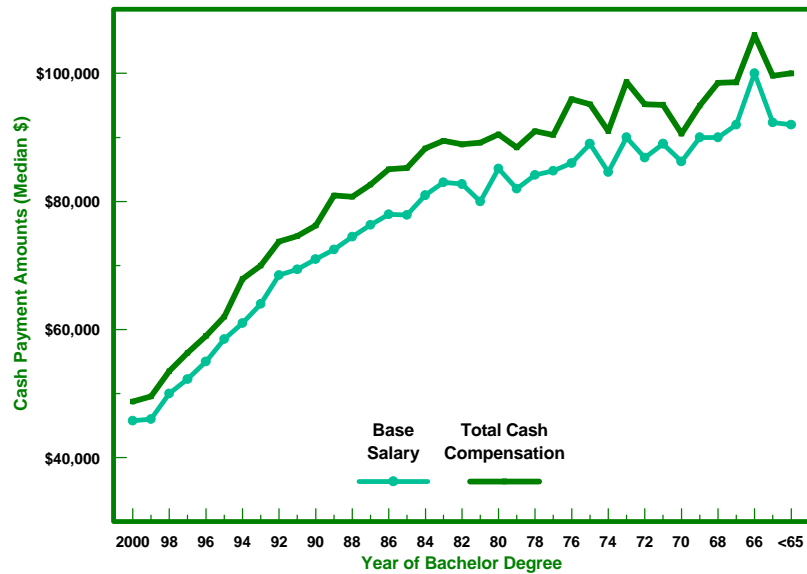


Table 8. Average Compensation Amounts for Self-Employed

Component	2000 Survey			1998 Survey			% Incr. Median
	No. of Engs.	Mean	Median	No. of Engs.	Mean	Median	
Base Salary	373	98,871	80,000	339	81,654	75,000	6.7
Cash Bonus	103	52,706	25,000	94	56,367	20,000	25.0
Profit Share	88	79,938	45,000	63	68,284	30,000	50.0
Commission	22	77,886	62,500	20	88,114	68,300	-8.5
OT/On-Call Premiums	5	14,540	10,400	3	7,667	5,000	108.0
Consulting Fees	175	91,110	80,000	180	80,681	70,000	14.3
Other	43	52,051	43,000	35	33,809	34,500	24.6
Avg. Total Cash	555	124,885	100,000	512	106,977	87,550	14.2

Annual Salaries by Industry

Table 9 reports the annual base salaries for 28 main industry sectors where professional engineers work.

Percentage increases vary widely from 2.4% to 50.6% over the 1998 median base salary results. Some of the higher increases may be due to differences in survey samples from year to year.

The highest median salary in all 28 categories is \$97,000 for the data processing sector in non-manufacturing. The lowest reported median is \$68,243 for metals manufacturing.

Within the manufacturing sector, PEO members who work for petroleum products companies earn the highest median salary at \$90,000. Second highest at \$85,000 is electronics & electrical products engineers.

As already stated, the top earners in non-manufacturing work in data processing organizations. The second highest median is computer systems development. The two lowest non-manufacturing medians are consulting engineering (\$71,450) and construction (\$73,000).

Within government and education, the educational institutions sector historically leads the field with the highest of the four medians. The 2000 survey results showed this trend once again. While municipal government engineers earn a median base salary of \$70,000, engineers in education earn \$10,000 more per annum.

Federal government engineers reported slightly higher salaries than their provincial government counterparts—\$75,621 and \$75,000 respectively.

Major Industry Groupings

The proportion of engineers working in the manufacturing sector has remained relatively stable over the past 14 years. Percentages in manufacturing have ranged from 39% up to this year's high of almost 46%. The second largest group is consulting at just under 16% of responses.

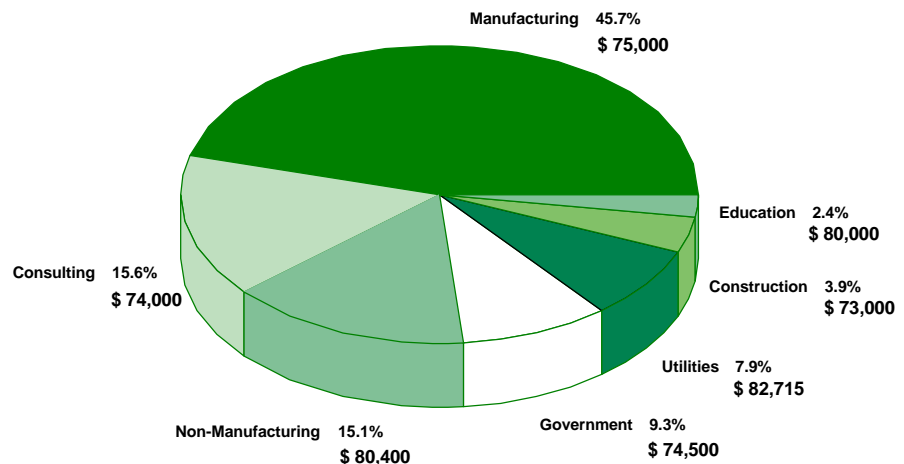
The government sector continues to decrease and now represents just over nine percent of the membership. Only 2.4% of full-time engineers work within educational institutions.

After regrouping the salary figures of the 28 industry categories down to seven major areas, engineers working for utility companies have the highest median salary of \$82,715. The lowest median base amount was reported in the construction industry (\$73,000).

Table 9. Annual Salaries by Industry

Industry	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr. 1998-2000 Median
MANUFACTURING								
Petroleum Products	157	92,547	57,720	68,000	90,000	105,540	132,000	11.1
Electronics, Electrical Prods.	727	89,918	56,250	68,000	85,000	105,000	127,000	17.4
Food, Beverages, Tobacco	85	85,734	56,000	66,700	83,000	99,900	116,000	16.9
Chemical & Pharmaceutical	279	84,311	55,000	65,000	80,000	95,000	120,000	11.7
Heavy Electrical	80	77,807	58,500	66,000	75,513	88,056	97,380	2.4
Plastics & Rubber	191	79,890	50,000	60,000	75,000	90,100	111,000	26.8
Transportation Equipment	538	78,612	55,000	62,400	74,000	87,000	106,831	13.8
Pulp & Paper, Wood Prods.	110	75,730	49,550	60,000	72,000	87,000	98,000	7.5
Other Manufacturing	363	76,226	50,000	59,700	71,400	88,000	110,000	16.8
Aerospace & Aircraft Prods.	276	75,984	53,500	58,000	71,210	88,460	107,500	16.1
Machinery (ex. electrical)	315	75,979	51,000	60,000	70,000	85,000	106,000	14.8
Metals	274	74,691	50,000	59,000	68,243	80,700	106,000	8.3
NON-MANUFACTURING								
Data Processing	36	101,091	60,000	76,800	97,000	120,000	140,000	30.2
Computer Systems Dev.	238	91,883	60,000	70,000	86,000	105,000	130,000	19.0
Electrical Utilities	409	86,697	69,504	75,500	84,240	93,184	107,100	6.2
Consulting, Other	189	92,786	51,000	63,000	84,000	100,000	135,000	8.1
Petroleum	24	83,429	57,200	73,600	82,070	95,500	102,600	50.6
Communication Services	249	93,544	60,000	73,400	82,000	100,000	120,000	12.7
Utilities, Other	176	81,131	60,000	70,000	80,000	90,000	100,000	8.1
Mining	153	86,474	59,000	65,500	78,000	96,000	125,000	8.3
Other Non-Manufacturing	309	86,290	50,000	64,769	78,000	100,000	132,000	10.3
Transportation Services	108	85,290	54,000	68,862	76,750	93,223	120,000	10.8
Construction	293	78,832	48,000	60,000	73,000	90,700	120,000	12.3
Consulting Engineering	968	74,674	45,000	55,600	71,450	87,390	105,000	19.1
GOVERNMENT & EDUCATION								
Educational Institutions	181	81,093	59,785	65,000	80,000	93,905	105,000	14.3
Federal Government	373	76,338	59,000	66,000	75,621	85,000	91,000	12.0
Provincial Government	114	77,144	60,000	68,000	75,000	85,000	94,500	8.0
Municipal Government	206	72,199	56,000	62,000	70,000	80,499	96,000	3.9

Figure 7. Distribution by Major Industry Sectors plus Median Base Salaries



Annual Salaries by Job Function

The two-year median increases in Table 10 range from 3.8% to 21.7%. The highest increase is for engineers working within health and safety.

Two new principal function categories were added to this year's questionnaire – consulting and regulatory/standards.

Engineers in production engineering earn the lowest median salary, \$63,998. Those primarily working in design reported a median base salary of \$65,000.

The highest median salary by job function (\$100,000) is attributed to PEO members working in general management. Those working in engineering management earn a median of \$86,000 in base salary. Historically these are the top two earning categories – with general management's median always being above that of the engineering management. In 1998 the difference between the two categories was \$10,000. This year the wage gap has widened to \$14,000.

Typically, engineers in senior positions (i.e. levels E, F, F+) receive a significant portion of their earned income from non-salary cash payments. Refer to Table 7 on page 10 for more details related to additional pay components such as bonuses and profit sharing payments.

Annual Salaries by Discipline

Table 11 provides the membership salary survey results by 12 distinct disciplines as well as a miscellaneous *other* category.

Graduates in the computer discipline achieved the highest median base salary. Second highest is nuclear at \$83,500.

The environmental discipline reported the lowest median income (\$61,000).

The discipline "systems design" was a new addition to the 2000 questionnaire. Engineers from this discipline reported strong base salaries (\$81,000 median) and placed in the fourth highest position.

The two-year survey rate increases in Table 11 range from 6.2% to 22%.

Annual Salaries by Job Category

PEO members who work in positions largely related to engineering earn a median base salary of \$73,540. This is \$16,460 less than the \$90,000 median salary earned by members who held non-engineering positions.

Over half (52%) of PEO members work in largely engineering related positions; 6% work in jobs that are unrelated to engineering.

Table 10. Annual Salaries by Job Function

Function	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr. 1998-2000 Median
General Management	961	107,182	67,700	80,000	100,000	124,700	160,000	11.1
Engineering Management	1,232	90,485	65,977	75,000	86,000	100,000	120,000	7.5
Teaching (University)	106	84,625	63,000	71,500	85,000	96,000	105,000	10.5
Health & Safety	48	82,437	56,000	74,295	82,750	86,500	102,000	21.7
Administration	100	86,985	59,220	68,534	82,250	101,450	120,000	10.4
Marketing/Sales	420	83,554	52,750	66,000	80,000	98,000	117,778	11.1
Computer Services/Systems	271	82,048	57,000	66,700	80,000	93,096	112,000	17.6
Research & Development	510	81,782	53,550	65,000	77,581	93,000	113,000	16.8
Other Non-Engineering	99	81,491	45,000	65,000	76,000	95,000	125,000	3.8
Planning	134	84,793	56,000	63,000	75,750	86,000	103,080	16.5
Maintenance Engineering	187	73,454	55,000	62,900	74,000	82,000	90,000	8.8
Consulting	535	78,505	46,000	58,000	73,000	90,000	110,000	n/a
Regulatory/Standards	147	77,295	50,800	61,500	73,000	83,000	92,000	n/a
Other Engineering	144	74,280	50,000	60,945	72,000	85,000	95,680	20.0
Teaching (Other)	48	70,076	50,000	62,000	71,000	73,000	84,000	12.6
Instrumentation/Control	114	71,705	54,000	60,948	70,000	82,000	90,000	11.5
Quality Assurance	190	70,423	48,385	58,000	70,000	83,000	93,360	21.0
Project Engineering	1,066	70,127	50,000	59,000	68,612	80,000	90,376	14.4
Environmental/Pollution	155	68,858	44,000	55,000	65,755	80,000	95,000	6.8
Design	635	67,275	46,000	54,080	65,000	79,000	90,000	20.0
Production Engineering	372	67,487	49,500	56,000	63,998	76,900	88,140	13.9

Table 11. Annual Salaries by Discipline

Engineering Field/ Discipline	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr. 1998-2000 Median
Computer	249	90,885	61,000	73,400	86,000	104,000	120,000	22.0
Nuclear	129	86,298	65,000	74,200	83,500	94,000	108,000	6.2
Electrical, Electronics	1,503	87,926	59,800	70,000	82,000	98,000	120,000	12.2
Systems Design	92	90,244	65,000	70,000	81,000	102,500	126,000	n/a
Other	177	84,936	52,860	65,000	78,987	98,000	129,000	17.9
Chemical	798	83,246	54,480	63,500	77,311	95,000	116,900	13.7
Metallurgical, Materials, Mining	301	83,761	56,000	63,000	77,250	94,000	120,000	9.8
Aeronautical, Aerospace	230	78,641	55,000	63,500	76,155	90,000	101,500	14.6
Mechanical, Industrial	2,255	79,807	53,400	62,476	75,000	89,000	109,000	11.9
Geological, Geotechnical	122	74,515	41,500	53,006	72,500	90,000	106,000	12.0
Civil, Structural	1,392	76,996	47,500	60,000	72,000	88,900	110,000	10.8
Biomedical, Biological	30	78,203	50,000	60,000	70,781	97,500	112,500	11.8
Environmental	215	66,359	42,000	50,000	61,000	79,500	95,000	8.8

Table 12. Annual Salaries by Job Category

Category	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr. 1998-2000 Median
Not Associated with Engineering	453	99,590	60,000	75,000	90,000	112,000	150,000	12.5
Associated with Engineering	3,157	85,162	55,000	66,000	80,000	96,000	120,000	12.7
Largely Engineering	3,891	76,709	51,000	60,000	73,540	87,200	104,000	13.1

Annual Salaries by Region

Refer to Table 13 for detailed findings based on geographical regions of respondents. Each PEO membership salary survey in recent history concludes that engineers who work outside of the province earn more than those who stay within Ontario. As of December 1, 2000 the median base salary for PEO members working out of the province was \$88,941.

Ottawa and Toronto tend to alternate as the second and third highest medians. This year the Greater Ottawa region is second and Greater Toronto third. Ottawa engineers report a median of \$80,532 – slightly above Toronto's \$78,800 median. Figure 8 assists in visualizing the differences in median salaries by geographic work region.

Annual Salaries by Size of Organization

Engineers working for larger organizations of over 500 employees make \$9,504 more than those working for companies with 25 or fewer employees. Table 14 indicates members employed by the larger organizations earn annual base salaries of \$79,504 (median). Employees in the smaller organizations reported \$70,000 as their median base salary.

The gap between large and small appears to be closing. Back in 1996, the membership salary survey calculated the difference between salaries paid by smallest versus largest employers to be \$14,000. In the 1998 survey, the difference was \$10,000. For the 2000 survey year, the gap has decreased again.

Annual Salaries by Highest Degree

Table 15 demonstrates the financial advantages of higher education. The value of an MBA - BEng combination adds \$15,000 to the median salary of the bachelor degree holder. Members with an MBA earn a median base salary of \$90,000. The mean salary statistics show an even stronger difference of \$21,576.

Engineers with a PhD in engineering reported base salary earnings of \$85,000 (median), compared to those with a bachelor degree who received \$75,000.

In the *1996 Membership Salary Survey*, PhD graduates had the highest median base salaries. The 1998 and 2000 salary surveys have both reported that an MBA appears to have a stronger effect on engineers' salaries.

While it is true that higher education does pay off in the long run, members with postgraduate degrees usually have to work 10-15 years before their academic investment pays off.

Table 13. Annual Salaries by Geographic Region

Work Region	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr.
								1998-2000 Median
Out of Province	183	95,071	54,000	69,700	88,941	112,500	140,000	14.0
Greater Ottawa	1,047	85,590	58,000	68,000	80,532	99,600	120,000	15.0
Greater Toronto	3,598	83,801	52,600	63,500	78,800	95,000	120,000	12.6
Eastern Ontario	508	78,315	55,000	65,000	75,932	88,250	103,000	9.0
Central Ontario	197	74,815	50,000	60,000	74,000	85,000	98,000	5.7
Southwestern Ontario	1,627	76,078	51,164	60,000	72,072	86,750	103,153	10.9
Northern Ontario	326	75,272	50,500	60,000	72,000	84,552	99,700	9.9

Figure 8. Median Annual Base Salaries by Region

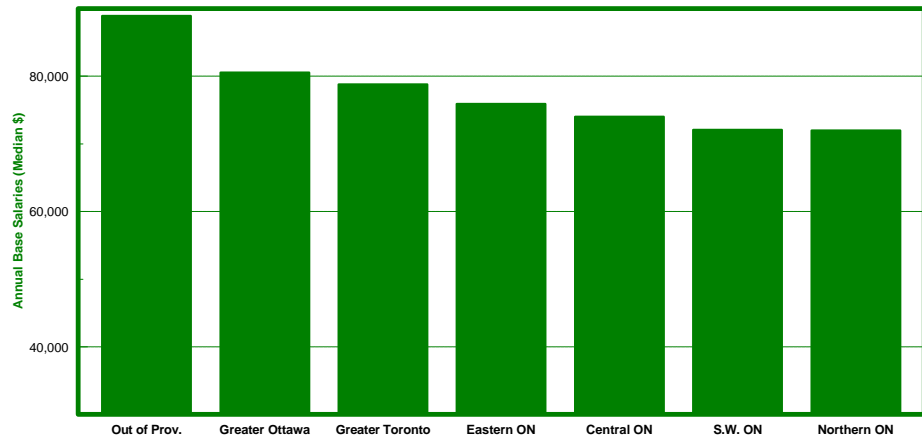


Table 14. Annual Salaries by Size of Organization

Size of Employer Organization (In Canada)	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr.
								1998-2000 Median
Over 500 Employees	4,348	83,704	57,000	67,000	79,504	94,000	113,822	12.0
101-500 Employees	1,653	79,786	50,000	60,000	74,500	90,000	115,000	13.7
26-100 Employees	883	78,192	47,840	58,000	72,000	90,000	115,000	12.7
2-25 Employees	564	76,450	43,500	55,000	70,000	88,875	115,000	16.7

Table 15. Annual Salaries by Highest Degree

Highest Degree Obtained	No. of Engs.	Mean	Low Decile	Low Quartile	Median	High Quartile	High Decile	% Incr.
								1998-2000 Median
MBA	558	100,070	66,000	75,877	90,000	115,000	149,040	8.4
PhD (Engineering)	345	91,644	61,000	70,000	85,000	103,000	130,000	8.0
Other	200	86,936	55,310	66,000	79,800	95,067	111,500	10.4
MASc, MEng, MEng	1,424	82,240	54,000	64,397	78,000	92,450	114,000	8.3
BASc, BEng, BEng	4,953	78,494	51,000	61,500	75,000	90,000	108,600	15.4

Benefits

The proportion of members eligible for those company benefits listed in Table 16 has not changed significantly from previous survey years. Slightly over 95% of members are covered by a drug plan; over 90% are eligible for long-term disability and 93% have group life benefits. Over 82% also have vision care programs.

Over three-quarters of PEO members participate in company pension plans.

Working Conditions

Sixteen percent of PEO members who are employed full-time are covered by a collective bargaining agreement.

In 1998, 34.5% of respondents were compensated for overtime. This year's result is slightly lower at 32.1%. Nine percent get a credit toward time off and the remainder receive cash compensation. Table 7 provides statistics on overtime payments reported by engineers at each responsibility level.

Over 41% stated that their employers pays their PEO annual license fee – slightly higher than the 1998 result of 38%.

The **base** work week for 51% of members was 40 hours. The base work week averaged 38.4 hours in 1998. This year's average is up by only a small fraction.

The **actual** hours worked is at an average of 46.5 hours per week. It is interesting to note that 38% of respondents reported that they work 50 or more hours a week.

Hourly Rates for Contract Engineers

A number of members are employed by organizations on a contract basis. A guideline (Table 17) has been prepared to assist engineers in establishing rates to be charged for professional services while working exclusively for one employer, on the employer's premises, with set working hours and vacation and statutory holiday pay (but not employee benefits).

For the purpose of this guideline, benefits are assumed to be 15% of salary.

This formula does **not** apply to engineers who are working out of their own offices and must bear the overhead costs associated with accommodation rental, equipment costs and various other operating and maintenance costs.

Similarly, it does not apply to engineering consulting companies, which use charge-out rates for various levels of professional staff working on a client's project. Nor does it apply to engineers who are furnished by an agency where the agency is paid for the services.

Note: To find out about engineering consulting fee rates, refer to PEO's *Schedule of Fees for Engineering Services*. This guideline is available on PEO's website under *Professional Guidelines*.

Table 16. Benefits and Working Conditions

BENEFITS		Responses	% Eligible	WORKING CONDITIONS		Yes %
Drug Plan		7,455	95.4	Part of A Collective Agreement?		15.8
Dental Plan		7,459	94.9	Eligible for Overtime?		32.1
Group Life		7,408	93.3	Greater than Straight		19.0
Hospitalization beyond OHIP		7,388	93.2	Straight Pay		33.8
Long-Term Disability		7,535	90.4	Credit Towards Time		9.4
Vision Care		7,309	82.6	Combination of Above		37.8
Pension		7,398	76.2	Annual Payment of PEO Fees		
				Employer Pays		41.1
				Pay Own Fees		58.8

WORKING WEEK					Average Hours Worked		
Base Work Week (Hrs)	30 to 35	Between		40	2000		1998
		35 & 40	40 & 50		Base	Actual	
% of Respondents	11.2	38.1		50.8	38.5		38.4
Actual Work Week (Hrs)	30 to 35	Between		40	40 & 50	50 or More	Actual
		35 & 40	40 & 50				
% of Respondents	3.0	8.2		17.1	34.1	37.6	46.5
							46.4

Table 17. Guideline for Hourly Rates for Contract Engineers

$$\text{Hourly charge rate} = \frac{\text{Annual salary from salary tables} \times 1.15}{\text{Annual working hours} (7.5 \times 5 \times 52 = 1950)}$$

Conclusion

Unemployment among PEO members has fallen below the one percent point. From a high of 2.7% reported in 1993, the engineering unemployment rate is now at its lowest level of the past twelve years.

In the two-year period since the last PEO Membership Salary Survey was conducted, the Consumer Price Index for Canada rose by 4.5%. As of December 1, 2000, PEO members earned a median base salary of \$77,000. This represents a 12.8% increase over the 1998 survey results.

Seven percent of professional engineers in Ontario are self-employed. By working for themselves, they are more likely to earn higher incomes. Engineers who are self-employed report an average total cash compensation of \$124,885. This mean figure is 33% higher than total cash amounts reported by full-time employees (\$94,182).

Overtime compensation is paid to one out of three engineers working full-time. Almost 90% of PEO members are permanent employees and the majority are not paid for overtime. Unlike self-employed professionals and those who bill clients on a time basis, most engineers work extra hours (an average of eight overtime hours a week) without compensation. The value of this donated time represents significant benefit to their employers and to Ontario's economy.

The salary-gender wage gap has increased again – for the third survey in a row. An 8% gap was reported in 1995. In 1996, 1998 and 2000, the wage gaps increased to 9%, 11% and 13% respectively. For the 2000 survey year, a 22-year cohort group was examined – those who graduated between 1978 and 1999. The median age for males in this group was five years older than that of females (37 years old versus 32). The age gap is a contributing factor to the wage gap as the median ages in 1995-1996 were three years apart and the 1998 difference was four years.

ABOUT THE SURVEY CONSULTANT - Janet Dalton is an Independent Research Consultant with over 15 years of experience in research and database analysis. She has been instrumental in several major compensation studies throughout her career. Her portfolio includes ten years of involvement in PEO's Employer and Membership Salary Surveys. She has also conducted numerous studies within the engineering and technology industry sectors for organizations such as CSA International and OACETT.



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