

**ACTUARIAL VALUATION  
OF THE  
MARBLEHEAD CONTRIBUTORY  
RETIREMENT SYSTEM**

**January 1, 2010**

**Reported Submitted  
November 4, 2010**



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## *Executive Summary*

### **Background**

We have completed the Actuarial Valuation of the Marblehead Contributory Retirement System as of January 1, 2010. This valuation is based upon census data provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Marblehead Retirement Board. Information for the prior valuation completed as of January 1, 2008 was obtained from the valuation report prepared by Buck Consultants.

### **Massachusetts General Laws**

The valuation was prepared in accordance with Chapter 32 of the Massachusetts General Laws ("M.G.L.") as amended by Section 18 of Chapter 21 of the Acts of 2009.

The valuation does not take into consideration:

- Changes in the law after the valuation date,
- Transfers between retirement systems pursuant to Section 3(8)(c) of Chapter 32,
- State-mandated benefits and
- Cost-of-living increases granted to members in pay status between 1982 and 1997.

### **GASB Statement Numbers 25 and 27**

The Governmental Accounting Standards Board (**GASB**) is responsible for establishing accounting standards for governmental entities. Calculations developed in accordance with GASB standards are required when providing financial statements.

GASB Statement Number 25 (**GASB 25**) establishes financial reporting standards for defined benefit pension plans of state and local governmental entities. The Statement establishes a framework that distinguishes between two categories of information: current financial information about plan assets and financial activities and actuarially determined information about the funded status of the plan and the progress being made in accumulating sufficient assets to pay benefits when due.

GASB Statement Number 27 establishes standards for the measurement, recognition, and display of pension expense and related liabilities, assets, note disclosures, and, if applicable, required supplementary information in the financial reports of state and local governmental employers. Employers are required to measure and disclose an amount for annual pension cost on the accrual basis of accounting, regardless of the amount recognized as pension expense on the accrual basis. Annual pension cost should be equal to the employer's Annual Required Contribution (ARC) to the plan.

The required disclosures under the GASB Statements are presented in Section V.

## *Executive Summary*

### **Actuarial Valuation**

The results of the current valuation show that over a two-year period, the System experienced an actuarial loss of \$12,780,232 comprising of an asset loss of \$14,084,832 and a liability gain of \$1,304,600. Most of the actuarial gain is attributable to the change in salary scale as well as a change in methodology from the prior actuary for recognizing valuation salary. For the 2008 valuation, salary data as of 2007 was used to determine benefit accruals for the 2008 plan year. For the 2010 valuation, we apply the salary scale to the 2009 annualized salaries provided and use the result to develop benefits accrued during 2010. The details of the gain/loss calculations are presented in Exhibit D, Section III.

### **Appropriations**

The funding appropriation for each year is computed as the sum of the Normal Cost and an amortization payment to pay off the Unfunded Actuarial Liability, adjusted for semi-annual payments of the appropriation made during the fiscal year. The appropriation as of January 1, 2010 is \$2,129,892. In Exhibit E, Section IV, we show how this calendar year funding appropriation is developed. We have incorporated the provisions of Section 18 of Chapter 21 of the Acts of 2009, which requires a funding schedule reflect appropriations that reduce the unfunded actuarial liability to zero by 2030. Previously, Section 22D required the unfunded actuarial liability be reduced to zero by 2028 and the prior valuation incorporated a target date of 2019.

For fiscal year 2011, we show the actual appropriation developed under the previous funding schedule and reported on the PERAC "Required Fiscal Year 2011 Appropriation" letter dated November 30, 2009 of \$2,347,285 and adjusted the subsequent entries of the current funding schedule accordingly. For fiscal years 2011-2014, we have incorporated the \$2,347,285 as the desired appropriation for these years. The current funding schedule is shown in Exhibit G, Section IV.

### **Actuarial Certification**

This report presents the results of the Actuarial Valuation of the Marblehead Contributory Retirement System as of January 1, 2010. The report presents the funding schedule contribution amounts for the fiscal years 2011 and 2012 and accounting and financial reporting information in accordance with Statement Numbers 25 and Number 27 of the Governmental Accounting Standards Board.

This valuation is based upon member data provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Marblehead Contributory Retirement System. Although we did not audit the data used in the valuation, we believe that the information is complete and reliable.

*Executive Summary*

This report was completed in accordance with generally accepted actuarial standards and procedures, and conforms to the Code of Professional Conduct of the American Academy of Actuaries. The actuarial assumptions used in the determination of costs are reasonably related to the experience of the System and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the System.

This report is intended for the sole use of the Marblehead Contributory Retirement System and is intended to provide information to comply with the stated purpose of the report. It may not be appropriate for other purposes.

The undersigned credentialed actuaries are Members of the American Academy of Actuaries and together meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein. They are available to answer any questions with regard to this report.

Respectfully submitted,



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**Marblehead Contributory Retirement System**  
**Actuarial Valuation as of January 1, 2010**

***Section I - Summary of Principal Valuation Results***

A summary of principal valuation results from the current valuation and the prior valuation follows. Changes in actuarial methods and assumptions and Plan provisions are discussed below, as well as changes in census data and asset information.

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>	<u>Percentage Increase / (Decrease)</u>
<b>Summary of Member Data</b>			
Active Members	344	360	(4.4%)
Average Age	49.1		
Average Service	12.5		
Salary (Prior Year)	\$15,492,864	\$15,827,608	(2.1%)
Average Salary	\$45,037	\$43,966	2.4%
Valuation Salary	\$16,244,071	\$15,827,608	2.6%
Retired Members and Beneficiaries	294	286	2.8%
Average Age	73.3	74.0	(0.9%)
Total Annual Pension	\$5,633,371	\$5,041,480	11.7%
Average Annual Pension	\$19,161	\$17,628	8.7%
Disabled Members	32	35	(8.6%)
Average Age	68.0	67.8	0.3%
Total Annual Pension	\$760,394	\$809,115	(6.0%)
Average Annual Pension	\$23,762	\$23,118	2.8%
Inactive Members	52	49	6.1%
Annuity Savings Fund	473,035	\$432,670	9.3%
<b>Actuarial Accrued Liability (AAL)</b>	<b>\$98,858,864</b>	<b>\$93,908,490</b>	<b>5.3%</b>
<b>Assets</b>			
Market Value of Assets	\$70,321,708	\$92,101,201	(23.6%)
Actuarial Value of Assets	77,353,879	84,442,905	(8.4%)
<b>Unfunded Accrued Liability (Surplus)</b>	<b>\$21,504,985</b>	<b>\$9,465,585</b>	<b>127.2%</b>
<b>Funded Status</b>	<b>78.2%</b>	<b>89.9%</b>	<b>(13.0%)</b>
<b>Normal Cost</b>			
Employer	\$530,709	\$902,256	(41.2%)
Employee	1,348,473	1,275,206	5.7%
Administrative Expenses	155,000	135,000	14.8%
Total Normal Cost	<u>\$2,034,182</u>	<u>\$2,312,462</u>	<u>(12.0%)</u>

***Section I - Summary of Principal Valuation Results***

**Appropriations**

Fiscal Year 2011	\$2,347,285	\$2,347,285	0.0%
Fiscal Year 2012	\$2,347,285	\$2,346,855	0.0%
Fiscal Year 2013	\$2,347,285	\$2,426,756	(3.3%)

**Actuarial Valuation**

All Actuarial Methods and Assumptions used in this valuation, including an interest rate of 8.00%, are the same as those used in the prior valuation, except the salary scale was changed to 3% (2010-2011), 3.5% (2012-2013) and 4% (2014+). Previously, the salary scale was 4% (2008-2009), 4.5% (2010-2011) and 5% (2012+). The Actuarial Methods and Assumptions utilized in this valuation are detailed in Section VIII, Actuarial Methods and Assumptions. In addition, the 2010 valuation salary is the 2009 calendar year salary information provided by the Retirement Board, which was annualized for new hires and updated to 2010 using the 3% salary scale.

We also changed the expense assumption used in the employer normal cost from \$135,000 to \$155,000.

**Plan Provisions**

All Plan provisions used in this valuation are the same as those used in the prior valuation. The Plan provisions utilized in this valuation are detailed in Section VII, Summary of Plan Provisions.

**Census Data**

As of January 1, 2010, there are 344 active members who may be eligible for benefits in the future, 294 retirees and beneficiaries, 52 inactives and 32 disabled retirees. Summaries of the active and retired employees are included in Section IX, Demographic Information.

**Assets**

This valuation is based upon asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Marblehead Retirement Board. The market value of assets decreased during the period January 1, 2008 through January 1, 2010, from \$92,101,201 as of January 1, 2008 to \$70,321,708 as of January 1, 2010. In Section II, we show how the actuarial asset value is developed.

***Section II - Asset Information***

Asset information is reported annually to the Public Employee Retirement Administration Commission by the Marblehead Contributory Retirement System. The Market Value of Assets for the three most recent calendar years are as follows:

<u>Calendar Year</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>
<b>Trust Fund Composition at Year-End</b>			
Cash	\$138,974	\$28,004	\$37,846
Short-Term Investments	0	0	0
Fixed Income Securities	0	0	0
Pooled Short Term Funds	0	0	0
Equities	0	0	0
Pooled Domestic Equity Funds	0	0	0
Pooled International Equity Funds	0	0	0
Pooled Global Equity Funds	0	0	0
Pooled Domestic Fixed Income Funds	0	0	0
Pooled International Fixed Income Fund:	0	0	0
Pooled Global Fixed Income Funds	0	0	0
Pooled Alternative Investments	0	0	0
Pooled Real Estate Funds	0	0	0
Pooled Domestic Balanced Funds	0	0	0
Pooled International Balanced Funds	0	0	0
Hedge Funds	0	0	0
PRIT Cash	130,133	50,774	201,753
PRIT Fund	68,884,461	61,598,248	90,731,265
Prepaid Expenses	0	0	0
Accounts Receivable	1,170,654	1,172,060	1,131,190
Interest Due & Accrued	0	0	0
Accounts Payable	(2,514)	(959)	(853)
Total Market Value of Assets	<u>\$70,321,708</u>	<u>\$62,848,127</u>	<u>\$92,101,201</u>

**Marblehead Contributory Retirement System**  
**Actuarial Valuation as of January 1, 2010**

**Section II - Asset Information**

<u>Calendar Year</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>
<b>Funds</b>			
Annuity Savings Fund	\$13,674,886	\$13,317,815	\$12,929,367
Annuity Reserve Fund	6,190,973	6,047,665	5,897,824
Special Military Service Cr Fund	3,072	0	2,062
Pension Fund	1,161,375	935,650	610,126
Expense Fund	0	0	0
Pension Reserve Fund	49,291,402	42,546,997	72,661,822
Total Market Value of Assets	<u>\$70,321,708</u>	<u>\$62,848,127</u>	<u>\$92,101,201</u>
<b>Asset Activity</b>			
Market value as of Beginning of Year	\$62,848,127	\$92,101,201	\$84,981,222
Contributions and Receipts	4,165,432	4,124,558	4,014,170
Benefit Payments and Expenses	(6,909,343)	(6,629,172)	(6,470,661)
Investment Return	10,217,492	(26,748,460)	9,576,470
Market Value as of End of Year	<u>\$70,321,708</u>	<u>\$62,848,127</u>	<u>\$92,101,201</u>
<b>Rate of Return</b>	16.65%	-29.48%	11.45%

Returns and annualized past returns are shown below. Information is obtained from the Investment Report published by PERAC for the years shown.

<u>Year</u>	<u>1-Year</u> <u>Return</u>	<u>5-Year</u> <u>Return</u>	<u>10-Year</u> <u>Return</u>	<u>Return</u> <u>(Since 1985)</u>
2009	17.80%	4.18%	4.20%	9.32%
2008	-29.44%	3.58%	4.68%	8.98%

**Section II - Asset Information**

The **Actuarial Value of Assets** is the market value of assets as of the valuation date reduced by the sum of:

- a) 80% of gains and losses of the prior year,
- b) 60% of gains and losses of the second prior year,
- c) 40% of gains and losses of the third prior year and
- d) 20% of gains and losses of the fourth prior year.

Investment gains and losses are determined by the excess or deficiency of the expected return over the actual return on the market value. The actuarial valuation of assets is further constrained to be not less than 90% or more than 110% of market value.

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2009</u>	<u>January 1, 2008</u>	
<b>1. Market Value of Assets as of prior January 1</b>	\$62,848,127	\$92,101,201	\$84,981,222	
a. Prior Year Contributions and Receipts	4,165,432	4,124,558	4,014,170	
b. Prior Year Benefit Payments and Expenses	(6,909,343)	(6,629,172)	(6,470,661)	
c. Expected Investment Return at 8.00%	4,908,947	7,259,563	6,700,239	
d. Expected Market Value of Assets as of Valuation Date	\$65,013,163	\$96,856,150	\$89,224,970	
<b>2. Prior Year Gain / (Loss)</b>				
a. Market Value of Assets as of January 1	\$70,321,708	\$62,848,127	\$92,101,201	
b. Expected Market Value of Assets	65,013,163	96,856,150	89,224,970	
c. Prior Year Gain / (Loss)	5,308,545	(34,008,023)	2,876,231	
<b>3. Phase-In of Asset Gains and Losses</b>				
<u>Plan Year</u>	<u>Gain / (Loss)</u>	<u>Unrecognized Gain / (Loss)</u>	<u>Unrecognized Gain / (Loss)</u>	<u>Unrecognized Gain / (Loss)</u>
a. 2009	\$5,308,545	\$4,246,836	-	-
b. 2008	(34,008,023)	(20,404,814)	(27,206,418)	-
c. 2007	2,876,231	1,150,492	1,725,739	2,300,985
d. 2006	5,948,070	1,189,614	2,379,228	3,568,842
e. 2005	2,675,217	-	535,043	1,070,087
f. 2004	3,591,908	-	-	718,382
g. Total		(13,817,872)	(22,566,408)	7,658,296

**Section II - Asset Information**

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2009</u>	<u>January 1, 2008</u>
<b>4. Actuarial Value of Assets</b>			
a. Market Value of Assets Less Unrecognized Gain / (Loss)	\$84,139,580	\$85,414,535	\$84,442,905
b. 90% of Market Value of Assets	63,289,537	56,563,314	82,891,081
c. 110% of Market Value of Assets	77,353,879	69,132,940	101,311,321
d. Actuarial Value of Assets, a., but not less than b. and not greater than c.	<b>\$77,353,879</b>	<b>\$69,132,940</b>	<b>\$84,442,905</b>
e. Ratio of Actuarial Value of Assets to Market Value of Assets	110.00%	110.00%	91.68%
<b>5. Rate of Return on Actuarial Value of Assets     for Prior Calendar Year</b>	16.21%	-15.41%	

***Section III - Actuarial Costs and Liabilities***

The **Actuarial Present Value of Future Benefits** is the present value of the cost to finance all benefits payable in the future, discounted to reflect the probability of payment and the time value of money. Below is the Actuarial Present Value of Future Benefits from the current valuation and the prior valuation:

**Exhibit A - Actuarial Present Value of Future Benefits**

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
<b>Actives</b>		
Superannuation	\$46,652,636	\$48,727,533
Termination	1,332,519	1,350,755
Death	1,950,261	2,285,634
Disability	4,940,644	5,628,121
Total Active	<u>\$54,876,060</u>	<u>\$57,992,043</u>
 <b>Retired Members and Inactives</b>		
Retired Members and Beneficiaries	\$51,286,879	\$45,218,606
Disabled Members	6,932,257	8,198,065
Inactive Members	473,035	901,701
Total Retired Members and Inactives	<u>\$58,692,171</u>	<u>\$54,318,372</u>
 <b>Total Present Value of Future Benefits</b>	 \$113,568,231	 \$112,310,415

***Section III - Actuarial Costs and Liabilities***

The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Future Benefits which is allocated to all periods prior to a valuation year and therefore is not provided for by future Normal Costs. Below is the Actuarial Accrued Liability from the current valuation and the prior valuation:

**Exhibit B - Actuarial Accrued Liability**

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
<b>Actives</b>		
Superannuation	\$36,092,576	\$35,402,738
Termination	650,964	566,761
Death	1,128,932	1,299,479
Disability	2,294,221	2,321,140
Total Active	<u>\$40,166,693</u>	<u>\$39,590,118</u>
 <b>Retired Members and Inactives</b>		
Retired Members and Beneficiaries	\$51,286,879	\$45,218,606
Disabled Members	6,932,257	8,198,065
Inactive Members	473,035	901,701
Total Retired Members and Inactives	<u>\$58,692,171</u>	<u>\$54,318,372</u>
 <b>Total Actuarial Accrued Liability</b>	 \$98,858,864	 \$93,908,490

***Section III - Actuarial Costs and Liabilities***

The **Normal Cost** is the portion of the Actuarial Present Value of Future Benefits which is allocated to a valuation year. Only active employees who have not reached Normal Retirement Age incur a Normal Cost. Below is the Normal Cost from the current valuation and the prior valuation:

**Exhibit C - Normal Cost**

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
<b>Actives</b>		
Superannuation	\$1,320,130	\$1,544,986
Termination	170,668	193,620
Death	107,895	121,838
Disability	280,489	317,018
Total Active	\$1,879,182	\$2,177,462
<b>Administrative Expenses</b>	\$155,000	\$135,000
<b>Total Normal Cost</b>		
Normal Cost	\$2,034,182	\$2,312,462
As a Percentage of Salary	12.5%	14.6%
<b>Employee Normal Cost</b>		
Employee Contributions	\$1,348,473	\$1,275,206
As a Percentage of Salary	8.3%	8.1%
<b>Employer Normal Cost</b>		
Employer Normal Cost	\$685,709	\$1,037,256
As a Percentage of Salary	4.2%	6.6%

***Section III - Actuarial Costs and Liabilities***

In performing the actuarial valuation, various assumptions are made regarding mortality, retirement, disability and withdrawal rates as well as salary increases and investment returns. A comparison of the results of the current valuation and the prior valuation is made to determine how closely actual experience relates to expected. During the two years since the last valuation, the total unfunded actuarial accrued liability of the System increased by \$29,493,300. Below is the development of the Actuarial Gain or Loss for the current 2-year period:

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
<b>Unfunded Actuarial Accrued Liability</b>		
a. Actuarial Accrued Liability	\$98,858,864	\$93,908,490
b. Actuarial Value of Assets	77,353,879	84,442,905
c. Unfunded Actuarial Accrued Liability	\$21,504,985	\$9,465,585
<b>Expected Actuarial Accrued Liability</b>		
a. Prior Actuarial Accrued Liability	\$93,908,490	
b. Normal Cost, Year 1	2,312,462	
c. Benefit Payments, Year 1	(6,629,172)	
d. Interest on a., b. and c.	7,410,412	
e. Expected Actuarial Accrued Liability, Year 1	\$97,002,192	
f. Normal Cost, Year 2	2,416,523	
g. Benefit Payments, Year 2	(6,909,343)	
h. Interest on a., b. and c.	7,654,092	
i. Expected Actuarial Accrued Liability	\$100,163,464	
j. Actual Actuarial Accrued Liability	\$98,858,864	
k. Liability (Gain) / Loss	(\$1,304,600)	
<b>Expected Actuarial Asset Value</b>		
a. Actuarial Value of Assets, Prior Valuation Date	\$84,442,905	
b. Normal Cost and Amortization Payments, Year 1	3,321,571	
c. Benefit Payments, Year 1	(6,629,172)	
d. Expected Investment Return	6,733,894	
e. Expected Actuarial Value of Assets	\$87,869,198	
f. Normal Cost and Amortization Payments, Year 2	3,471,042	
g. Benefit Payments, Year 2	(6,909,343)	
h. Expected Investment Return	7,007,814	
i. Expected Actuarial Value of Assets	\$91,438,711	
j. Actual Actuarial Value of Assets	\$77,353,879	
k. Asset (Gain) / Loss	\$14,084,832	
<b>Expected Unfunded Actuarial Accrued Liability</b>	<b>\$8,724,753</b>	
<b>Total Actuarial (Gain) / Loss</b>		
a. Asset (Gain) / Loss	\$14,084,832	(\$8,196,813)
b. Liability (Gain) / Loss	(1,304,600)	3,997,423
c. Total (Gain) / Loss	\$12,780,232	(\$4,199,390)

***Section IV - Chapter 32 of M.G.L. Appropriations***

The **Annual Appropriation** is determined in accordance with the requirements set forth in Section 22D of Chapter 32 of the Massachusetts General Laws ("M.G.L.") as amended by Section 18 of Chapter 21 of the Acts of 2009. The appropriation is comprised of the annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. Below are the details of the annual appropriation for the current valuation and the prior valuation. The annual appropriation for the following valuation is recomputed based on the actual appropriation made for the current fiscal year:

**Exhibit E - Annual Appropriations**

<u>Valuation Date</u>	<u>January 1, 2011</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
<b>Employer Normal Cost</b>	\$695,831	\$685,709	\$1,037,256
<b>Amortization Payments</b>			
a. Prior Unfunded Actuarial Accrued Liability	\$21,665,666	\$8,724,753	\$9,465,585
Amortization Period (in years)	19	20	11
Interest Rate	8.00%	8.00%	8.00%
Payment Increase Rate	4.50%	4.50%	4.50%
Amortization Payment as of January 1	\$1,509,171	\$585,917	\$1,009,109
Amortization Payment as of next January 1			\$1,054,519
b. Current Gain or Loss*	(\$93,044)	\$12,780,232	
Amortization Period (in years)	19	20	
Interest Rate	8.00%	8.00%	
Payment Increase Rate	4.50%	4.50%	
Amortization Payment	(\$6,481)	\$858,266	
c. Total Amortization Payments	\$1,502,690	\$1,444,183	\$1,009,109
<b>Total Cost as of January 1</b>	<b>\$2,198,521</b>	<b>\$2,129,892</b>	<b>\$2,046,365</b>
<b>Salary</b>	<b>\$16,975,054</b>	<b>\$16,244,071</b>	<b>\$15,827,608</b>
<b>Total Cost as a Percent of Salary</b>	<b>13.0%</b>	<b>13.1%</b>	<b>12.9%</b>
<b>* Current Gain or Loss</b>			
a. Fiscal Year Appropriation	2,347,285		
b. Discounted to current valuation date	2,216,044		
c. Appropriation based on current valuation	2,129,892		
d. Excess Contribution as of current valuation	86,152		
e. Excess Contribution as of next valuation	93,044		
= d. x (1.08).			

*Section IV - Chapter 32 of M.G.L. Appropriations*

In **Exhibit F**, we present **Total Employer Cost Forecast as of January 1**, a thirty-year funding forecast as of the calendar years based on the calculations for the current valuation in this report and from assumptions noted below:

- Payroll and Total Normal Cost are both expected to increase 4.50% per year.
- The Employee Contribution rate is shown to increase linearly from the 2010 percentage to 10.50% by 2028 as members contributing at the lower rates are replaced by new members contributing over 9%.
- Employer Normal Cost is the difference between Total Normal Cost and Employee Contributions.
- The Unfunded Actuarial Accrued Liability ("UAL") is computed as of January 1 of each year assuming no future gains or losses.  
  
For years 2010-2013, the amortization of the UAL is determined so that the appropriations remain constant, and payments thereafter fully amortize the UAL by 2030, utilizing an amortization payment increasing at 4.50% per year.
- Total Employer Cost is the sum of the Employer Normal Cost and the Amortization of the UAL, all computed as of January 1 of each year.
- Total Employer Cost for Fiscal Year 2011 is consistent with the previously approved appropriation and the amortization of the UAL for 2010 is adjusted to reflect this.

In **Exhibit G**, we present **30-Year Forecast of Annual Appropriation**, a Section 22D funding forecast as of the fiscal years. The calculations shown in a year are based upon the calculations shown in Exhibit F for the prior January 1 with the cost adjusted for equal employer contributions for the fiscal year assumed to be made July 1, October 1, January 1 and April 1 of that fiscal year.

In **Exhibit H**, we present **30-Year Forecast of Cash Flow**, a forecast as of the calendar years based on the information on contributions shown in Exhibit F and the assumptions noted below.

- Benefit payments exclude cost-of-living increases granted to members in pay status between 1982 and 1997. In addition, benefit payments are as expected for the first ten years of the forecast, then increase by the greater of 4.50% per year thereafter or the expected future payments for the current population projected by our computer model.
- Total Expected Actuarial Value of Assets assumes no asset gains or losses in any years following the valuation date.
- The Funded Ratio % is the ratio of the Expected Actuarial Value of Assets over the sum of the Unfunded Actuarial Accrued Liability and the Expected Actuarial Value of Assets.

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**Exhibit F - Total Employer Cost Forecast as of January 1  
Calendar Year Projections**

Calendar Year	Payroll	Total Normal Cost	Employee Contributions	Employer Normal Cost	UAL	Amortization Payment of UAL	Total Employer Cost	Employer Cost as a Percent of Payroll
2010	\$16,244,071	\$2,034,182	\$1,348,473	\$685,709	\$21,504,985	<b>\$1,530,335</b>	\$2,216,044	13.6%
2011	16,975,054	2,125,720	1,429,889	695,831	21,572,622	<b>\$1,520,213</b>	2,216,044	13.1%
2012	17,738,931	2,221,377	1,515,902	705,475	21,656,602	<b>\$1,510,569</b>	2,216,044	12.5%
2013	18,537,183	2,321,339	1,606,760	714,579	21,757,716	<b>\$1,501,465</b>	2,216,044	12.0%
2014	19,371,356	2,425,799	1,702,726	723,073	21,876,751	1,730,503	2,453,576	12.7%
2015	20,243,067	2,534,960	1,804,076	730,884	21,757,948	1,808,376	2,539,260	12.5%
2016	21,154,005	2,649,033	1,911,099	737,934	21,545,538	1,889,753	2,627,687	12.4%
2017	22,105,935	2,768,239	2,024,100	744,139	21,228,248	1,974,791	2,718,930	12.3%
2018	23,100,702	2,892,810	2,143,402	749,408	20,793,734	2,063,657	2,813,065	12.2%
2019	24,140,234	3,022,986	2,269,342	753,644	20,228,483	2,156,522	2,910,166	12.1%
2020	25,226,545	3,159,020	2,402,276	756,744	19,517,718	2,253,565	3,010,309	11.9%
2021	26,361,740	3,301,176	2,542,579	758,597	18,645,285	2,354,975	3,113,572	11.8%
2022	27,548,018	3,449,729	2,690,645	759,084	17,593,535	2,460,949	3,220,033	11.7%
2023	28,787,679	3,604,967	2,846,887	758,080	16,343,193	2,571,692	3,329,772	11.6%
2024	30,083,125	3,767,191	3,011,744	755,447	14,873,221	2,687,418	3,442,865	11.4%
2025	31,436,866	3,936,715	3,185,672	751,043	13,160,667	2,808,352	3,559,395	11.3%
2026	32,851,525	4,113,867	3,369,155	744,712	11,180,500	2,934,728	3,679,440	11.2%
2027	34,329,844	4,298,991	3,562,700	736,291	8,905,434	3,066,791	3,803,082	11.1%
2028	35,874,687	4,492,446	3,766,842	725,604	6,305,734	3,204,797	3,930,401	11.0%
2029	37,489,048	4,694,606	3,936,350	758,256	3,349,012	3,349,012	4,107,268	11.0%
2030	39,176,055	4,905,863	4,113,486	792,377	-	-	792,377	2.0%
2031	40,938,977	5,126,627	4,298,593	828,034	-	-	828,034	2.0%
2032	42,781,231	5,357,325	4,492,029	865,296	-	-	865,296	2.0%
2033	44,706,386	5,598,405	4,694,171	904,234	-	-	904,234	2.0%
2034	46,718,173	5,850,333	4,905,408	944,925	-	-	944,925	2.0%
2035	48,820,491	6,113,598	5,126,152	987,446	-	-	987,446	2.0%
2036	51,017,413	6,388,710	5,356,828	1,031,882	-	-	1,031,882	2.0%
2037	53,313,197	6,676,202	5,597,886	1,078,316	-	-	1,078,316	2.0%
2038	55,712,291	6,976,631	5,849,791	1,126,840	-	-	1,126,840	2.0%
2039	58,219,344	7,290,579	6,113,031	1,177,548	-	-	1,177,548	2.0%

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Below we present an **Appropriations Forecast** over the next thirty years under the adopted funding schedule. The cost components of the Total Employer Cost Forecast presented in Exhibit F have been adjusted to account for quarterly payments

**Exhibit G - 30-Year Forecast of Annual Appropriations**

Fiscal Year Ending	Total Normal Cost	Employee Contributions	Employer Normal Cost	Amortization Payment of UAL	Total Employer Cost
2011	\$2,154,653	\$1,428,334	\$726,319	\$1,620,966	\$2,347,285
2012	2,251,612	1,514,571	737,041	1,610,244	2,347,285
2013	2,352,934	1,605,678	747,256	1,600,029	2,347,285
2014	2,458,816	1,701,917	756,899	1,590,386	2,347,285
2015	2,569,462	1,803,567	765,895	1,832,989	2,598,884
2016	2,685,088	1,910,919	774,169	1,915,474	2,689,643
2017	2,805,917	2,024,280	781,637	2,001,670	2,783,307
2018	2,932,183	2,143,973	788,210	2,091,744	2,879,954
2019	3,064,131	2,270,341	793,790	2,185,873	2,979,663
2020	3,202,017	2,403,739	798,278	2,284,238	3,082,516
2021	3,346,107	2,544,546	801,561	2,387,028	3,188,589
2022	3,496,682	2,693,158	803,524	2,494,444	3,297,968
2023	3,654,033	2,849,993	804,040	2,606,694	3,410,734
2024	3,818,464	3,015,488	802,976	2,723,996	3,526,972
2025	3,990,296	3,190,109	800,187	2,846,575	3,646,762
2026	4,169,859	3,374,337	795,522	2,974,671	3,770,193
2027	4,357,503	3,568,687	788,816	3,108,532	3,897,348
2028	4,553,590	3,773,694	779,896	3,248,416	4,028,312
2029	4,758,503	3,989,926	768,577	3,394,595	4,163,172
2030	4,972,635	4,169,473	803,162	3,547,351	4,350,513
2031	5,196,403	4,357,099	839,304	-	839,304
2032	5,430,242	4,553,169	877,073	-	877,073
2033	5,674,602	4,758,061	916,541	-	916,541
2034	5,929,960	4,972,174	957,786	-	957,786
2035	6,196,808	5,195,921	1,000,887	-	1,000,887
2036	6,475,664	5,429,739	1,045,925	-	1,045,925
2037	6,767,069	5,674,076	1,092,993	-	1,092,993
2038	7,071,587	5,929,410	1,142,177	-	1,142,177
2039	7,389,809	6,196,234	1,193,575	-	1,193,575
2040	7,722,350	6,475,064	1,247,286	-	1,247,286

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Below we present a thirty-year forecast of **Cash Flow**.

**Exhibit H - 30-Year Forecast of Cash Flow**

Calendar Year	Assets as of Beginning of Fiscal Year	Benefit Payments	Employee Contributions	Employer Contributions	Investment Return	Assets as of End of Fiscal Year	Expected Actuarial Value of Assets	Unfunded Actuarial Liability	Funded Ratio
2010	\$70,321,708	\$6,684,522	\$1,348,473	\$2,216,044	\$5,621,235	\$72,822,938	\$84,139,579	\$21,504,985	79.6%
2011	72,822,938	6,969,162	1,429,889	2,216,044	5,815,513	75,315,222	82,665,774	21,572,622	79.3%
2012	75,315,222	7,273,310	1,515,902	2,216,044	6,008,597	77,782,455	79,993,409	21,656,602	78.7%
2013	77,782,455	7,581,620	1,606,760	2,216,044	6,199,884	80,223,523	76,720,746	21,757,716	77.9%
2014	80,223,523	7,904,316	1,702,726	2,453,576	6,407,866	82,883,375	80,223,523	21,876,751	78.6%
2015	82,883,375	8,274,550	1,804,076	2,539,260	6,619,573	85,571,734	82,883,375	21,757,948	79.2%
2016	85,571,734	8,594,868	1,911,099	2,627,687	6,836,397	88,352,049	85,571,734	21,545,538	79.9%
2017	88,352,049	8,890,326	2,024,100	2,718,930	7,062,359	91,267,112	88,352,049	21,228,248	80.6%
2018	91,267,112	9,211,837	2,143,402	2,813,065	7,298,707	94,310,449	91,267,112	20,793,734	81.4%
2019	94,310,449	9,473,790	2,269,342	2,910,166	7,548,666	97,564,833	94,310,449	20,228,483	82.3%
2020	97,564,833	9,900,111	2,402,276	3,010,309	7,809,189	100,886,496	97,564,833	19,517,718	83.3%
2021	100,886,496	10,345,616	2,542,579	3,113,572	8,075,102	104,272,133	100,886,496	18,645,285	84.4%
2022	104,272,133	10,811,169	2,690,645	3,220,033	8,346,141	107,717,783	104,272,133	17,593,535	85.6%
2023	107,717,783	11,297,672	2,846,887	3,329,772	8,621,990	111,218,760	107,717,783	16,343,193	86.8%
2024	111,218,760	11,806,067	3,011,744	3,442,865	8,902,273	114,769,575	111,218,760	14,873,221	88.2%
2025	114,769,575	12,337,340	3,185,672	3,559,395	9,186,553	118,363,855	114,769,575	13,160,667	89.7%
2026	118,363,855	12,892,520	3,369,155	3,679,440	9,474,320	121,994,250	118,363,855	11,180,500	91.4%
2027	121,994,250	13,472,683	3,562,700	3,803,082	9,764,986	125,652,335	121,994,250	8,905,434	93.2%
2028	125,652,335	14,078,954	3,766,842	3,930,401	10,057,878	129,328,502	125,652,335	6,305,734	95.2%
2029	129,328,502	14,712,507	3,936,350	4,107,268	10,352,228	133,011,841	129,328,502	3,349,012	97.5%
2030	133,011,841	15,374,570	4,113,486	792,377	10,367,185	132,910,319	133,011,841	-	100.0%
2031	132,910,319	16,066,426	4,298,593	828,034	10,346,744	132,317,264	132,910,319	-	100.0%
2032	132,317,264	16,789,415	4,492,029	865,296	10,286,426	131,171,600	132,317,264	-	100.0%
2033	131,171,600	17,544,939	4,694,171	904,234	10,181,320	129,406,386	131,171,600	-	100.0%
2034	129,406,386	18,334,461	4,905,408	944,925	10,026,044	126,948,302	129,406,386	-	100.0%
2035	126,948,302	19,159,512	5,126,152	987,446	9,814,706	123,717,094	126,948,302	-	100.0%
2036	123,717,094	20,021,690	5,356,828	1,031,882	9,540,858	119,624,972	123,717,094	-	100.0%
2037	119,624,972	20,922,666	5,597,886	1,078,316	9,197,445	114,575,953	119,624,972	-	100.0%
2038	114,575,953	21,864,186	5,849,791	1,126,840	8,776,759	108,465,157	114,575,953	-	100.0%
2039	108,465,157	22,848,074	6,113,031	1,177,548	8,270,376	101,178,038	108,465,157	-	100.0%

***Section V - GASB Statement Numbers 25 and 27***

The Governmental Accounting Standards Board (GASB) requires certain disclosures of pension liabilities for public employer financial statements in accordance with Statement Numbers 25 and 27. Footnote disclosures required by GASB Statement Numbers 25 and 27 include a description of the Plan, a summary of significant accounting policies and information about contributions, legally required reserves and investment concentrations. The Annual Required Contribution (ARC) shown is for the fiscal year beginning the following July 1.

Below is the required disclosure information:

<u>Valuation Date</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
1. Actuarial Accrued Liability	\$98,858,864	\$93,908,490
2. Actuarial Value of Assets	77,353,879	84,442,905
3. Unfunded Actuarial Accrued Liability (UAAL)	\$21,504,985	\$9,465,585
4. Funded Ratio = 2. ÷ 1.	78.2%	89.9%
5. Covered Payroll	\$16,244,071	\$15,827,608
6. UAAL as a Percentage of Covered Payroll = 3. ÷ 5.	132.4%	59.8%
7. Annual Required Contribution (ARC)	\$2,347,285	\$2,347,285
8. Net Pension Obligation	\$0	\$0

**Schedule of Funding Progress**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) / c)
1/1/2010	77,353,879	98,858,864	21,504,985	78.2%	16,244,071	132.4%
1/1/2008	84,442,905	93,908,490	9,465,585	89.9%	15,827,608	59.8%
1/1/2006	69,105,082	82,948,269	13,843,187	83.3%	14,159,647	97.8%
1/1/2004	64,490,373	76,875,640	12,385,267	83.9%	13,982,752	88.6%
1/1/2002	60,615,356	71,022,123	10,406,767	85.3%	13,268,405	78.4%
1/1/2000	54,015,622	63,939,027	9,923,405	84.5%	11,833,509	83.9%

**Section VI - PERAC Disclosure Information**

The most recent actuarial valuation of the System was prepared by Ricci Consultants, Incorporated as of January 1, 2010.

The normal cost for employees on that date was:	\$1,348,473	8.3% of payroll
The normal cost for the employer was:	\$685,709	4.2% of payroll

The actuarial liability for active members was:	\$40,166,693
The actuarial liability for retired and inactive members was:	58,692,171
Total actuarial liability:	\$98,858,864
System assets (actuarial value) as of that date:	\$77,353,879
Unfunded actuarial accrued liability:	\$21,504,985

The ratio of System assets to total actuarial accrued liability was: 78.2%

The principal actuarial assumptions used in the valuation are as follows:

Investment Return:	8.00%
Rate of Salary Increase:	3.00% (2010)
	3.50% (2011-2014)
	4.00% thereafter

**Schedule of Funding Progress**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b-a) / c)
1/1/2010	77,353,879	98,858,864	21,504,985	78.2%	16,244,071	132.4%
1/1/2008	84,442,905	93,908,490	9,465,585	89.9%	15,827,608	59.8%
1/1/2006	69,105,082	82,948,269	13,843,187	83.3%	14,159,647	97.8%
1/1/2004	64,490,373	76,875,640	12,385,267	83.9%	13,982,752	88.6%
1/1/2002	60,615,356	71,022,123	10,406,767	85.3%	13,268,405	78.4%
1/1/2000	54,015,622	63,939,027	9,923,405	84.5%	11,833,509	83.9%

**Section VII - Summary of Plan Provisions**

**Administration** There are 107 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws and other applicable statutes. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

**Participation** Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the local retirement board, and approved by PERAC. Membership is optional for certain elected officials.

There are four classes of membership in the retirement system:

Group 1: General employees, including clerical, administrative, technical and all other employees not otherwise classified.

Group 2: Certain specified hazardous duty positions.

Group 3: State police officers and inspectors.

Group 4: Local police officers, firefighters and other specified hazardous positions.

For members in more than one group, participation will be proportional.

**Member Contributions** Member contributions vary depending on the most recent date of membership:

Prior to 1975:	5% of Salary
1975 – 1983:	7% of Salary
1984 – June 30, 1996:	8% of Salary
July 1, 1996 – present:	9% of Salary
1979 – present:	An additional 2% of Salary in excess of \$30,000.

**Rate of Interest** Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least ten financial institutions.

**Retirement Age** The mandatory retirement age for some Group 2 and Group 4 members is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for members in Group 1.

**Salary** Gross regular compensation. This does not include bonuses, overtime, severance pay, unused sick leave credit or other similar compensation.

**Section VII - Summary of Plan Provisions**

**Average Salary**                      Average annual rate of regular compensation received during the three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.

**Creditable Service**                The period during which a member contributes to the retirement system plus certain periods of military service and “purchased” service.

**Benefit Rate**                         Varies with the member’s retirement age, but the highest rate of 2.5% applies to Group 1 members who retire at or after age 65, Group 2 members who retire at or after age 60 and to Group 4 members who retire at or after age 55.

A .1% reduction is applied to each year of age under the maximum age for the member’s group.

The benefit rate for Group 1 is used for Group 2 members who terminate from service prior to age 55.

Rate	Group 1	Age Group 2	Group 4
2.50%	65+	60+	55+
2.40%	64	59	54
2.30%	63	58	53
2.20%	62	57	52
2.10%	61	56	51
2.00%	60	55	50
1.90%	59	--	49
1.80%	58	--	48
1.70%	57	--	47
1.60%	56	--	46
1.50%	55	--	45

**Superannuation Retirement**                      Eligibility

- completion of 20 years of Creditable Service, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4, or
- attainment of age 55 with 10 years of Creditable Service, if hired after 1978, and if classified in Group 1 or 2

Benefit Amount                              Product of the member’s Benefit Rate, Average Salary and Creditable Service.

Maximum Benefit                            80% of the member’s Average Salary.

Veteran’s Benefit                            Additional benefit of \$15 per year of Creditable Service, up to a maximum of \$300.

**Section VII - Summary of Plan Provisions**

<b>Deferred Vested</b>	Eligibility	<ul style="list-style-type: none"> <li>• completion of ten or more years of Creditable Service.</li> <li>• elected officials hired prior to 1978, completion of six years of Creditable Service.</li> </ul>
	Benefit Amount	Accrued benefit payable commencing at age 55, or the completion of 20 years of Creditable Service, or may be deferred until later at the participant's option.
<b>Withdrawal of Contributions</b>		<p>Contributions may be withdrawn upon termination of employment.</p> <ul style="list-style-type: none"> <li>• Members hired prior to 1984 receive contributions plus 100% of interest credited.</li> <li>• Members hired after 1983 with less than five years of Creditable Service receive contributions only.</li> <li>• Members hired after 1983 with more than five years of Creditable Service but less than ten years receive contributions plus 50% of interest credited.</li> <li>• Members hired after 1983 with more than ten years of Creditable Service receive contributions plus 100% of interest credited.</li> </ul>
<b>Ordinary Disability Retirement</b>	Eligibility	Non-job related disability after completion of ten years of Creditable Service.
	Benefit Amount	Superannuation benefit determined if the member is age 55, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
<b>Accidental Disability Retirement</b>	Eligibility	Disabled as a result of an accident in the performance of duties. There is no minimum age or service requirement.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of Creditable Service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$415 per year for each child.

**Section VII - Summary of Plan Provisions**

<b>Non-Occupational Death</b>	Eligibility	For members with at least two years of creditable service who die while in active service, but not due to occupational injury.
	Benefit Amount	Benefit as if Option C had been elected. Minimum benefit of
<b>Accidental Death</b>	Eligibility	For members who die as a result of an occupational injury.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of creditable service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$415 per year for each child.
<b>Cost-of-Living Adjustment (COLA)</b>		In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a Cost-of-Living Adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees and beneficiaries who have been receiving benefit payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$12,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the Commonwealth of Massachusetts and are not the liability of the Retirement System.
<b>Optional Forms of Payment</b>		A member may elect to receive his or her retirement allowance in one of three forms of payment: <ul style="list-style-type: none"> <li>• Option A – Life annuity.</li> <li>• Option B – Life annuity with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member.</li> <li>• Option C – Life annuity with 66<math>\frac{2}{3}</math>% of benefit continued to designated joint annuitant upon death of member.</li> </ul>

***Section VIII - Actuarial Methods and Assumptions***

**Valuation Date:** January 1, 2010

**Investment Return:** 8.00% per year

**Annuity Savings Fund Interest Rate:** 3.00% per year

**Amortization Method:** *Unfunded Actuarial Accrued Liability (UAL):*  
 Amortization payments toward reducing the UAL so the appropriations for fiscal years 2011-2014 remain constant, and payments thereafter fully amortize the UAL by 2030, utilizing an amortization payment increasing at 4.50% per year.

**Salary Scale:** The assumed annual rates for salary increases including longevity are illustrated by the following rates:

<u>Year</u>	<u>January 1, 2010</u>	<u>January 1, 2008</u>
1-2	3.00%	4.00%
3-4	3.50%	4.50%
5+	4.00%	5.00%

**Cost-of-Living Allowance:** Cost-of-Living Allowances (COLA) are assumed to be 3% of the pension amount, capped at \$360 per year.

**Mortality Table:** RP-2000 Mortality Table. RP-2000 Mortality Table set forward two years for disabled members.  
  
80% of deaths are accidental and 20% are ordinary.

**Turnover Rates:** Illustrative turnover rates are shown below:

<u>Creditable</u>	<u>General Employees</u>	<u>Police and Fire</u>
0	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

**Section VIII - Actuarial Methods and Assumptions**

**Disability Rates:** Illustrative disability rates are shown below:

<u>Attained Age</u>	<u>General Employees</u>	<u>Police and Fire</u>
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125

*General Employees:* 55% of disabilities are accidental and 45% are ordinary.

*Police and Fire:* 90% of disabilities are accidental and 10% are ordinary.

**Retirement Rates:** Illustrative retirement rates are shown below:

<u>Age</u>	<u>General Employees</u>		<u>Police and Fire</u>
	<u>Male</u>	<u>Female</u>	<u>Male &amp; Female</u>
50	0.0100	0.0150	0.0200
51	0.0100	0.0150	0.0200
52	0.0100	0.0200	0.0200
53	0.0100	0.0250	0.0500
54	0.0200	0.0250	0.0750
55	0.0200	0.0550	0.1500
56	0.0250	0.0650	0.1000
57	0.0250	0.0650	0.1000
58	0.0500	0.0650	0.1000
59	0.0650	0.0650	0.1500
60	0.1200	0.0500	0.2000
61	0.2000	0.1300	0.2000
62	0.3000	0.1500	0.2500
63	0.2500	0.1250	0.2500
64	0.2200	0.1800	0.3000
65	0.4000	0.1500	1.0000
66	0.2500	0.2000	1.0000
67	0.2500	0.2000	1.0000
68	0.3000	0.2500	1.0000
69	0.3000	0.2000	1.0000
70	1.0000	1.0000	1.0000

**Section VIII - Actuarial Methods and Assumptions**

**Actuarial Cost Method:** Individual Entry Age Normal.

**Actuarial Asset Method:** The Actuarial Value of Assets is the market value of assets as of the valuation date reduced by the sum of:

- a) 80% of gains and losses of the prior year,
- b) 60% of gains and losses of the second prior year,
- c) 40% of gains and losses of the third prior year and
- d) 20% of gains and losses of the fourth prior year.

Investment gains and losses are determined by the excess or deficiency of the expected return over the actual return on the market value. The actuarial valuation of assets is further constrained to be not less than 90% or more than 110% of market value.

**Census Data:** Census data as of the valuation date were submitted by the Retirement Board.

**Asset Data:** Asset information is reported annually to the Public Employee Retirement Administration Commission by the Marblehead Contributory Retirement System.

**Dependents:** 80% of all members will be survived by a spouse. Age assumption for spouses is that males are assumed to be three years older than females.

**Administrative Expenses:** The anticipated administrative expenses for the fiscal year. For Fiscal Year 2011, the administrative expenses were assumed to be \$155,000.

Section IX - Demographic Information

Active Members by Age and Years of Service as of January 1, 2010

Age	Years of Service									Total
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up	
Under 20	-	-	-	-	-	-	-	-	-	0
	-	-	-	-	-	-	-	-	-	0
20-24	4	-	-	-	-	-	-	-	-	4
	35,752	-	-	-	-	-	-	-	-	35,752
25 to 29	12	1	-	-	-	-	-	-	-	13
	41,742	47,967	-	-	-	-	-	-	-	42,221
30 to 34	15	10	2	-	-	-	-	-	-	27
	41,856	46,163	63,298	-	-	-	-	-	-	45,039
35 to 39	8	11	10	3	-	-	-	-	-	32
	46,682	42,916	54,251	74,693	-	-	-	-	-	50,379
40 to 44	11	10	11	4	2	-	-	-	-	38
	35,990	45,985	51,076	50,965	55,450	-	-	-	-	45,588
45 to 49	13	11	10	4	5	4	-	-	-	47
	30,698	40,538	34,761	46,001	56,188	82,506	-	-	-	42,289
50 to 54	11	16	14	3	4	8	5	-	-	61
	34,695	37,670	43,282	35,938	56,507	65,496	81,163	-	-	46,786
55 to 59	12	9	17	3	6	8	7	6	-	68
	34,752	29,729	33,755	57,635	54,742	64,160	68,726	63,560	-	46,110
60 to 64	5	7	6	8	7	3	1	4	2	43
	42,232	30,853	53,635	37,285	39,031	52,928	50,005	53,232	80,465	44,258
65 to 69	1	1	2	-	1	1	-	-	-	6
	37,625	26,940	28,986	-	48,723	40,721	-	-	-	35,330
70 & up	-	2	-	-	2	1	-	-	-	5
	-	13,544	-	-	42,381	36,553	-	-	-	29,681
Total	92	78	72	25	27	25	13	10	2	344
Average Salary	37,909	38,817	43,585	47,638	50,112	64,133	72,069	59,429	80,465	45,037

Average Salary is based on prior calendar year salaries.

Average Age:

49.1

Average Service:

12.5

Section IX - Demographic Information

Retired Plan Participants and Beneficiaries Annual Pensions as of January 1, 2010

Attained Age	Male		Female		Total	
	Count	Total Payments	Count	Total Payments	Count	Total Payments
<20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	0	0	0	0	0	0
45-49	1	3,152	2	10,683	3	13,835
50-54	4	142,817	1	33,971	5	176,788
55-59	17	500,993	4	79,875	21	580,868
60-64	23	810,656	10	118,514	33	929,170
65-69	24	806,503	30	394,710	54	1,201,213
70-74	27	725,516	19	235,851	46	961,368
75-79	18	353,500	26	294,019	44	647,519
80-84	15	322,263	40	528,675	55	850,938
85-89	3	46,728	18	142,984	21	189,713
90-94	2	15,066	8	57,416	10	72,482
95+	1	5,570	1	3,908	2	9,478
Total	135	3,732,764	159	1,900,607	294	5,633,371
Average Age	69.7		76.4		73.3	
Average Payment		27,650		11,954		19,161
Percent	45.9%	66.3%	54.1%	33.7%	100.0%	100.0%

Section IX - Demographic Information

Disabled Retired Plan Participants Annual Pensions as of January 1, 2010

Attained Age	Male		Female		Total	
	Count	Total Payments	Count	Total Payments	Count	Total Payments
<20	0	0	0	0	0	0
20-24	0	0	0	0	0	0
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	0	0	0	0
40-44	1	38,841	1	12,952	2	51,792
45-49	1	38,258	0	0	1	38,258
50-54	0	0	1	15,766	1	15,766
55-59	6	172,325	1	8,904	7	181,229
60-64	5	177,889	0	0	5	177,889
65-69	1	22,726	1	18,782	2	41,508
70-74	2	61,554	1	9,012	3	70,566
75-79	2	36,755	1	10,653	3	47,407
80-84	1	22,392	0	0	1	22,392
85-89	3	76,625	4	36,962	7	113,587
90-94	0	0	0	0	0	0
95+	0	0	0	0	0	0
Total	22	647,363	10	113,030	32	760,394
Average Age	66.3		71.7		68.0	
Average Payment		29,426		11,303		23,762
Percent	68.8%	85.1%	31.3%	14.9%	100.0%	100.0%

*Section X - Glossary of Terms*

**Actuarial Accrued Liability** – That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

**Actuarial Assumptions** – Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the commencement, amount and duration of pension benefits, such as: changes in compensation, mortality, withdrawal, disablement and retirement; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

**Actuarial Cost Method (or Funding Method)** – A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the current year (Normal Cost) and the past (Actuarial Accrued Liability).

**Actuarial Gain or Loss (or Experience Gain or Loss)** – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between the valuation date and the most recent immediately preceding valuation date.

**Note:** The effect on the Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method or Plan provisions would be described as such, not as an Actuarial Gain (Loss).

**Actuarial Present Value** – The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

**Amortization Payment** – That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

**Annual Required Contribution (ARC)** – The employer's periodic required contributions to a defined benefit pension plan, calculated in accordance with the rules required by the Governmental Accounting Standards Board (GASB).

**Annual Statement** – The statement submitted by the local retirement board to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

**Annuity Reserve Fund** – The fund into which total accumulated Member Contributions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

**Annuity Savings Fund** – The fund in which Member Contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

**Assets** – The total value of the investments held by the Plan trust that are for the payment of promised benefits.

*Section X - Glossary of Terms*

**Cost of Benefits** – The estimated payment from the pension system for benefits for the fiscal year.

**Expense Fund** – The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

**Funded Ratio** – The Actuarial Value of Assets expressed as a percentage of the Actuarial Accrued Liability.

**Funding Schedule** – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22D of M.G.L. Chapter 32.

**GASB** – Governmental Accounting Standards Board.

**Normal Cost** – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is expected to accrue in the current fiscal year. The Employee Normal Cost is the amount of the expected Member Contributions for the current fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

**Pension Benefit Obligation** – The portion of the Actuarial Present Value attributable to past service in accordance with the Projected Unit Credit cost method as stipulated by GASB Statement Number 5 (GASB 5). GASB 5 has been superseded by GASB Statements Number 25 and 27.

**Pension Fund** – The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

**Pension Reserve Fund** – The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

**Present Value of Future Benefits** – The actuarial present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value of money and the probabilities of payment.

**Special Fund for Military Service Credit** – The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

**Unfunded Actuarial Accrued Liability** – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

Section XI - Unit Allocation

Membership Data

Unit	Town	Police	Fire	Harbor	Sewer	Water	Light	Housing Authority	School	Hospital	Total
<b>Summary of Member Data</b>											
Active Members	99.0	42.0	42.0	4.0	11.0	11.0	26.0	10.0	99.0	0.0	344.0
Average Age	53.0	41.9	40.6	52.7	46.5	48.5	48.1	46.5	52.8	0.0	49.2
Average Service	13.6	13.8	12.1	19.4	15.5	16.3	15.0	10.0	9.5	0.0	12.5
Total Valuation Salary	4,585,155	2,286,960	2,088,117	212,157	517,819	532,756	1,805,177	438,034	3,026,689	-	15,492,864
Average Valuation Salary	46,315	54,451	49,717	53,039	47,074	48,432	69,430	43,803	30,573	-	45,037
Retired Members and Beneficiaries	87.3	38.8	34.0	2.0	7.3	4.8	25.9	1.0	78.0	15.0	294.0
Average Age	74.1	68.6	70.7	78.3	73.7	73.3	73.1	67.0	74.4	81.2	73.3
Total Annual Pension	1,469,304	1,195,997	1,084,859	44,267	113,494	107,293	724,801	10,731	740,087	142,538	5,633,371
Average Annual Pension	16,827	30,864	31,908	22,133	15,654	22,214	28,039	10,731	9,488	9,503	19,161
Disabled Members	2.3	12.0	10.0	-	-	-	0.8	-	5.0	2.0	32.0
Average Age	75.5	66.4	63.5	-	-	-	55.6	-	71.7	87.0	68.0
Total Annual Pension	32,137	329,704	297,320	-	-	-	6,678	-	55,972	38,583	760,394
Average Annual Pension	14,283	27,475	29,732	-	-	-	8,904	-	11,194	19,291	23,762
Inactive Members	14.0	5.0	-	-	1.0	-	-	3.0	29.0	-	52.0
Annuity Savings Fund	191,952	11,807	-	-	1,434	-	-	48,783	219,059	-	473,035

**Section XI - Unit Allocation**

**Actuarial Valuation Results as of January 1, 2010**

Unit	Town	Police	Fire	Harbor	Sewer	Water	Light	Housing Authority	School	Hospital	Total
<b>Actuarial Accrued Liability (AAL)</b>	26,177,593	20,712,778	17,979,125	1,149,747	2,739,557	2,708,463	12,107,698	1,119,885	13,100,392	1,063,626	98,858,864
<b>Assets</b>											
Market Value of Assets	18,621,022	14,733,711	12,789,170	817,855	1,948,741	1,926,623	8,612,622	796,612	9,318,759	756,593	70,321,708
Actuarial Value of Assets	20,483,124	16,207,082	14,068,087	899,640	2,143,615	2,119,285	9,473,884	876,274	10,250,635	832,253	77,353,879
<b>Unfunded Accrued Liability (Surplus)</b>	5,694,469	4,505,696	3,911,038	250,107	595,942	589,178	2,633,814	243,611	2,849,757	231,373	21,504,985
<b>Funded Status</b>	78.2%	78.2%	78.2%	78.2%	78.2%	78.2%	78.2%	78.2%	78.2%	78.2%	78.2%
<b>Normal Cost</b>											
Employer	106,279	90,710	108,290	4,278	4,629	4,202	86,666	2,353	123,303	-	530,709
Employee	391,850	202,854	187,320	16,030	40,533	39,421	164,996	39,050	266,419	-	1,348,473
Administrative Expenses	41,043	32,475	28,189	1,803	4,295	4,247	18,984	1,756	20,540	1,668	155,000
Total Normal Cost	539,172	326,039	323,799	22,111	49,457	47,870	270,646	43,159	410,262	1,668	2,034,182
<b>Amortization</b>	405,229	320,634	278,317	17,798	42,408	41,927	187,427	17,336	202,794	16,465	1,530,335
<b>Total Employer Cost</b>	552,551	443,819	414,796	23,879	51,332	50,376	293,077	21,445	346,637	18,133	2,216,044
<b>Appropriations</b>											
Fiscal 2011 Cost	585,275	470,103	439,361	25,293	54,372	53,360	310,433	22,715	367,166	19,207	2,347,285
Fiscal 2012 Cost	585,275	470,103	439,361	25,293	54,372	53,360	310,433	22,715	367,166	19,207	2,347,285
Fiscal 2013 Cost	585,275	470,103	439,361	25,293	54,372	53,360	310,433	22,715	367,166	19,207	2,347,285
Fiscal 2014 Cost	585,275	470,103	439,361	25,293	54,372	53,360	310,433	22,715	367,166	19,207	2,347,285