

Guide to Retirement Benefit Calculations

August 2008
Commonwealth of Massachusetts
Public Employee Retirement Administration Commission

John Boorack, *PERAC Actuarial Associate*
Scott Henderson, *PERAC Senior Actuarial Analyst*



Commonwealth of Massachusetts

Public Employee Retirement Administration Commission

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Introductory Letter

The purpose of this document is to present the basic retirement benefit calculations as provided for in Chapter 32 of the Massachusetts General Laws. In addition to the allowance calculations, this booklet demonstrates the relationship between the different Options.

Each benefit calculation is introduced by an assumed fact pattern that includes fundamental information about the retiree. Next, the allowance is calculated, based on the information provided in the fact pattern and the applicable section of the law. Options A, B, and C are shown for only the Superannuation calculations. For every other benefit, only the Option A amount is calculated. This booklet is not all encompassing; only the most common calculations are shown.

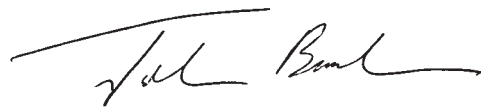
Although many retirement boards use computer applications to calculate retirement allowances, it is most important that boards understand the fundamentals upon which these programs are based. This understanding will enable board administrators to validate their calculation software, properly apply the law to an individual's specific circumstances, and more fully explain the benefit structure to prospective retirees and their families.

While this booklet is designed to be a training tool, it does assume an initial understanding of the different retirement benefits. We have included a glossary of notes and definitions to assist in this understanding.

The PERAC Actuarial Unit welcomes any comments you may have on this booklet and encourages all retirement boards to contact us at any time with inquiries about calculations.



James R. Lamenzo
PERAC Actuary



John Boorack
PERAC Actuarial Associate

Table of Contents

1. Superannuation Options A, B, & C.....	1
Fact Pattern for Superannuation Options A, B, & C.....	2
Calculation for Superannuation Option A.....	3
Calculation for Superannuation Option B.....	4
Calculation for Superannuation Option C.....	5
2. Superannuation Options A, B, & C (80% Limitation).....	7
Fact Pattern for Superannuation Options A, B, & C (80% Limitation)	8
Calculation for Superannuation Option A (80% Limitation)	9
Calculation for Superannuation Option B (80% Limitation)	10
Calculation for Superannuation Option C (80% Limitation).....	11
3. Accidental Disability Option A.....	13
Fact Pattern & Calculation for Accidental Disability Option A	14
4. Accidental Disability Option A (75% Cap).....	15
Fact Pattern & Calculation for Accidental Disability Option A (75% Cap).....	16
5. Ordinary Disability Non-Veteran Option A.....	17
Fact Pattern & Calculation for Ordinary Disability Non-Veteran Option A	18
6. Ordinary Disability Veteran Option A.....	19
Fact Pattern & Calculation for Ordinary Disability Veteran Option A.....	20
7. Section 12(2)(d)	21
Fact Pattern for Section 12(2)(d)	22
Calculation for Section 12(2)(d)	23
Fact Pattern for Section 12(2)(d) Veteran	24
Calculation for Section 12(2)(d) Veteran.....	25
Fact Pattern for Section 12(2)(d) Veteran Minimum.....	26
Calculation for Section 12(2)(d) Veteran Minimum	27
8. Termination Allowance Option A.....	29
Fact Pattern & Calculation for Termination Allowance Option A.....	30
9. Pop-Up	31
Fact Pattern & Calculation for Pop-Up	32
Fact Pattern & Calculation for Pop-Up Veteran.....	34
10. Notes and Definitions.....	37

I. Superannuation | Options A, B, & C

Superannuation | Options A, B, & C

Fact Pattern

<i>Member's Date of Birth</i>	12/07/1952
<i>Member's Age</i>	55 Years, 5 Months
<i>Member's Sex</i>	F
<i>Job Group</i>	I
<i>Membership Date</i>	07/01/1993
<i>Date of Retirement</i>	06/01/2008
<i>Veteran</i>	N
<i>Total Creditable Service</i>	14 Years, 11 Months
<i>Salary</i>	
<i>Current Year</i>	\$8,000.00 (5 months)
<i>Previous Year</i>	\$18,900.00 (12 months)
<i>Previous Year</i>	\$18,200.00 (12 months)
<i>Previous Year</i>	\$10,500.00 (7 months)
<i>Total</i>	\$55,600.00 (36 months)
<i>3 Year Average</i>	\$18,533.33
<i>ASF Balance</i>	\$35,000.00
<i>Beneficiary's Date of Birth</i>	12/07/1949
<i>Beneficiary's Age</i>	58 years, 5 months

Superannuation | Option A

Calculation

	3 Year Average Salary	\$18,533.33
x	Age Factor (0.015)	
=	Base	\$278.00
x	Creditable Service (14.9167)	
=	Total	\$4,146.84
÷	12	\$345.57
<i>Superannuation Formula Allowance (I)</i>	x 12	\$4,146.84

	80% of 3 Year Average Salary	\$14,826.66
÷	12	\$1,235.56
<i>80% Allowance (II)</i>	x 12	\$14,826.72

<i>Opt. A Allowance (lesser of I or II)</i>	Opt. A Allowance	\$4,146.84
	+ Veteran's Benefit	\$0.00
<i>Total Opt. A Allowance</i>	= Total Allowance	\$4,146.84

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$35,000.00
x	Annuity Factor (0.00701)	
=	Monthly Annuity	\$245.35
x	12	
=	Annual Annuity	\$2,944.20
<i>(Annual Allowance - Annual Annuity)</i>	Annual Pension	\$1,202.64
	Annual Allowance	\$4,146.84
	Monthly Allowance	\$345.57

All calculations are rounded to the nearest penny.

Superannuation | Option B

Calculation

	3 Year Average Salary	\$18,533.33
x	Age Factor (0.015)	
=	Base	\$278.00
x	Creditable Service (14.9167)	
=	Total	\$4,146.84
÷	12	\$345.57
<i>Superannuation Formula Allowance (I)</i>	x 12	\$4,146.84

	80% of 3 year Average Salary	\$14,826.66
÷	12	\$1,235.56
<i>80% Allowance (II)</i>	x 12	\$14,826.72

<i>Opt. A Allowance (lesser of I or II)</i>	Opt. A Allowance	\$4,146.84
	+ Veteran's Benefit	0.00
<i>Total Opt. A Allowance</i>	= Total Allowance	\$4,146.84

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$35,000.00
<i>Opt. A Annuity Factor</i>	x Annuity Factor (0.00701)	
	= Monthly Annuity	\$245.35
	x 12	
	= Annual Annuity	\$2,944.20
<i>(Annual Allowance - Annual Annuity)</i>	Annual Pension	\$1,202.64
	Annual Allowance	\$4,146.84
	Monthly Allowance	\$345.57

Opt. B Allowance: Annuity/Pension Allocation

	ASF Balance:	\$35,000.00
<i>Opt. B Annuity Factor</i>	x Annuity Factor (0.00686)	
	= Monthly Annuity	\$240.10
	x 12	
	= Annual Annuity	\$2,881.20
<i>(Same as the Opt. A Pension)</i>	Annual Pension	\$1,202.64
	Annual Allowance	\$4,083.84
	Monthly Allowance	\$340.32

All calculations are rounded to the nearest penny.

Superannuation | Option C

Calculation		
	3 Year Average Salary	\$18,533.33
x	Age Factor (0.015)	
=	Base	\$ 278.00
x	Creditable Service (14.9167)	
=	Total	\$4,146.84
÷	12	\$345.57
<i>Superannuation Formula Allowance (I)</i>	x 12	\$4,146.84
<hr/>		
	80% of 3 year Average Salary	\$14,826.66
÷	12	\$1,235.56
<i>80% Allowance (II)</i>	x 12	\$14,826.72
<hr/>		
<i>Opt. A Allowance (lesser of I or II)</i>	Opt. A Allowance	\$4,146.84
	+ Veteran's Benefit	0.00
<i>Total Opt. A Allowance</i>	= Total Allowance	\$4,146.84
<hr/>		
Opt. A Allowance: Annuity/Pension Allocation		
	ASF Balance	\$35,000.00
x	Annuity Factor (0.00701)	
=	Monthly Annuity	\$245.35
x	12	
=	Annual Annuity	\$2,944.20
<i>(Annual Allowance - Annual Annuity)</i>	Annual Pension	\$1,202.64
	Annual Allowance	\$4,146.84
	Monthly Allowance	\$345.57
<hr/>		
Opt. C Allowance: Annuity/Pension Allocation		
<i>(Opt. A Monthly Annuity) \$245.35 x (Opt. C Factor) .9421 = (Monthly Annuity) \$231.14</i>		
	Monthly Annuity	\$ 231.15 <small>(Divisible by 3)</small>
x	12	
=	Annual Annuity	\$2,773.80
<hr/>		
<i>(Opt. A Monthly Allowance) \$345.57 x (Opt. C Factor) .9421 = (Monthly Allowance) \$325.56</i>		
	Monthly Allowance	\$325.56 <small>(Divisible by 3)</small>
x	12	
=	Annual Allowance	\$3,906.72
<hr/>		
<i>(Opt. C Monthly Allowance) \$325.56 - (Opt. C Monthly Annuity) \$231.15 = (Monthly Pension) \$94.41</i>		
	Monthly Pension	\$94.41
x	12	
=	Annual Pension	\$1,132.92

All calculations are rounded to the nearest penny.

2. Superannuation | Options A, B, & C (80% Limitation)

Superannuation | Options A, B, & C (80% Limitation)

Fact Pattern

<i>Member's Date of Birth</i>	03/01/1950
<i>Member's Age</i>	57 Years, 10 Months
<i>Member's Sex</i>	M
<i>Job Group</i>	4
<i>Membership Date</i>	01/01/1973
<i>Date of Retirement</i>	01/01/2008
<i>Veteran</i>	Y
<i>Total Creditable Service</i>	35 Years, 0 Months
<i>Salary</i>	
<i>Current Year</i>	\$50,000.00 (12 months)
<i>Previous Year</i>	\$49,000.00 (12 months)
<i>Previous Year</i>	\$48,000.00 (12 months)
<i>Previous Year</i>	\$0.00 (0 months)
<i>Total</i>	\$147,000.00 (36 months)
<i>3 Year Average</i>	\$49,000.00
<i>ASF Balance</i>	\$78,000.00
<i>Beneficiary's Date of Birth</i>	08/01/1949
<i>Beneficiary's Age</i>	58 years, 5 months

Superannuation | Option A (80% Limitation)

Calculation

	3 Year Average Salary	\$49,000.00
x	Age Factor (0.025)	
=	Base	\$1,225.00
x	Creditable Service (35.0000)	
=	Total	\$42,875.00
÷	12	\$3,572.92
<i>Superannuation Formula Allowance (I)</i>	x 12	\$42,875.04

	80% of 3 Year Average Salary	\$39,200.00
÷	12	\$3,266.67
<i>80% Allowance (II)</i>	x 12	\$39,200.04

<i>Opt. A Allowance (lesser of I or II)</i>	Opt. A Allowance	\$39,200.04
	+ Veteran's Benefit	\$300.00
<i>Total Opt. A Allowance</i>	= Total Allowance	\$39,500.04

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$78,000.00
x	Annuity Factor (0.00733)	
=	Monthly Annuity	\$571.74
x	12	
=	Annual Annuity	\$6,860.88
<i>(Annual Allowance - Annual Annuity)</i>	Annual Pension	\$32,639.16
	Annual Allowance	\$39,500.04
	Monthly Allowance	\$3,291.67

All calculations are rounded to the nearest penny.

Superannuation | Option B (80% Limitation)

Calculation

	3 Year Average Salary	\$49,000.00
x	Age Factor (0.025)	
=	Base	\$1,225.00
x	Creditable Service (35.0000)	
=	Total	\$42,875.00
÷	12	\$3,572.92
<i>Superannuation Formula Allowance (I)</i>	x 12	\$42,875.04

	80% of 3 Year Average Salary	\$39,200.00
÷	12	\$3,266.67
<i>80% Allowance (II)</i>	x 12	\$39,200.04

<i>Opt. A Allowance (lesser of I or II)</i>	Opt. A Allowance	\$39,200.04
	+ Veteran's Benefit	\$300.00
<i>Total Opt. A Allowance</i>	= Total Allowance	\$39,500.04

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$78,000.00
x	Annuity Factor (0.00733)	
=	Monthly Annuity	\$571.74
x	12	
=	Annual Annuity	\$6,860.88
<i>(Annual Allowance - Annual Annuity)</i>	Annual Pension	\$32,639.16
	Annual Allowance	\$39,500.04
	Monthly Allowance	\$3,291.67

Opt. B Allowance: Annuity/Pension Allocation

	ASF Balance	\$78,000.00
<i>Opt. B Annuity Factor</i>	x Annuity Factor (0.00712)	
	= Monthly Annuity	\$555.36
	x 12	
	= Annual Annuity	\$6,664.32
<i>(Same as the Opt. A Pension)</i>	Annual Pension	\$32,639.16
	Annual Allowance	\$39,303.48
	Monthly Allowance	\$3,275.29

All calculations are rounded to the nearest penny.

Superannuation | Option C (80% Limitation)

Calculation

	3 Year Average Salary	\$49,000.00
x	Age Factor (0.025)	
=	Base	\$1,225.00
x	Creditable Service (35.0000)	
=	Total	\$42,875.00
÷	12	\$3,572.92
<i>Superannuation Formula Allowance (I)</i>	x 12	\$42,875.04

	80% 3 Year Average Salary	\$39,200.00
÷	12	\$3,266.67
<i>80% Allowance (II)</i>	x 12	\$39,200.04

<i>Opt. A Allowance (lesser of I or II)</i>	Opt. A Allowance	\$39,200.04
	+ Veteran's Benefit	\$300.00
<i>Total Opt. A Allowance</i>	= Total Allowance	\$39,500.04

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$78,000.00
x	Annuity Factor (0.00733)	
=	Monthly Annuity	\$571.74
x	12	
=	Annual Annuity	\$6,860.88
<i>(Annual Allowance - Annual Annuity)</i>	Annual Pension	\$32,639.16
	Annual Allowance	\$39,500.04
	Monthly Allowance	\$3,291.67

Opt. C Allowance: Annuity/Pension Allocation

(Opt. A Monthly Annuity) \$571.74 x (Opt. C Factor) .9224 = (Monthly Annuity) \$527.37

	Monthly Annuity	\$527.37	<i>(Divisible by 3)</i>
x	12		
=	Annual Annuity	\$6,328.44	

(Opt. A Mon. All. (Less Vet.'s Ben.)) \$3,266.67 x (Opt. C Fact.) .9224 + (Mon. Vet's Ben.) 25 = (Monthly Allowance) \$3,038.18

	Monthly Allowance	\$3,038.19	<i>(Divisible by 3)</i>
x	12		
=	Annual Allowance	\$36,458.28	

(Opt. C Monthly Allowance) \$3,038.19 - (Opt. C Monthly Annuity) \$527.37 = (Monthly Pension) \$2,510.82

	Monthly Pension	\$2,510.82
x	12	
=	Annual Pension	\$30,129.84

All calculations are rounded to the nearest penny.

3.Accidental Disability | Option A

Accidental Disability | Option A

Fact Pattern

<i>Member's Date of Birth</i>	03/01/1950
<i>Member's Age</i>	57 Years, 10 Months
<i>Member's Sex</i>	M
<i>Job Group</i>	4
<i>Membership Date</i>	01/01/1987
<i>Date of Retirement</i>	01/01/2008
<i>Veteran</i>	N
<i>Total Creditable Service</i>	21 Years, 0 Months
<i>Salary</i>	
<i>Current Year</i>	\$50,000.00 (12 months)
<i>ASF Balance</i>	\$30,000.00

Calculation

	Annual Salary	\$50,000.00
x	72%	
=	Pension	\$36,000.00
÷	12	\$3,000.00
x	12	\$36,000.00
	Annual Pension	\$36,000.00

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$30,000.00
x	Annuity Factor (0.00733)	
=	Monthly Annuity	\$219.90
x	12	
=	Annual Annuity	\$2,638.80
	Annual Pension	\$36,000.00
	Annual Allowance	\$38,638.80
	Monthly Allowance	\$3,219.90

(Annuity + Pension)

All calculations are rounded to the nearest penny.

4. Accidental Disability | Option A (75% Cap)

Accidental Disability | Option A (75% Cap)

Fact Pattern

Member's Date of Birth	01/01/1959
Member's Age	49 Years, 0 Months
Member's Sex	M
Job Group	4
Membership Date	01/01/1999
Date of Retirement	01/01/2008
Veteran	N
Total Creditable Service	9 Years, 0 Months
Salary	
Current Year	\$35,000.00 (12 months)
ASF Balance	\$25,000.00

Calculation

<i>Annuity Calculation:</i>			
ASF Balance	\$25,000.00	x 72%	Annual Salary \$35,000.00
x Annuity Factor (0.00654)		= Pension	\$25,200.00
= Monthly Annuity	\$163.50	÷ 12	\$2,100.00
x 12		x 12	\$25,200.00
= Annual Annuity	\$1,962.00	Annual Pension	\$25,200.00
		Annual Annuity (from the left)	\$1,962.00
		AD Allowance (I)	\$27,162.00

		75% Limit (75% of Salary)	\$26,250.00
		÷ 12	\$2,187.50
		x 12	\$26,250.00
		AD Allowance (II)	\$26,250.00

Opt. A Allowance: Annuity/Pension Allocation

		ASF Balance	\$25,000.00
		x Annuity Factor (0.00654)	
		= Monthly Annuity	\$163.50
		x 12	
		= Annual Annuity	\$1,962.00
<i>Minimum of (I) or (II) from above</i>		Annual Allowance	\$26,250.00
<i>(Annual Allowance - Annual Annuity)</i>		Annual Pension	\$24,288.00
		Monthly Allowance:	\$2,187.50

All calculations are rounded to the nearest penny.

5. Ordinary Disability Non-Veteran | Option A

Ordinary Disability Non-Veteran | Option A

Fact Pattern

Member's Date of Birth	01/01/1959
Member's Age	49 Years, 0 Months
Member's Sex	M
Job Group	4
Membership Date	02/01/1991
Date of Retirement	01/01/2008
Veteran	N
Total Creditable Service	16 Years, 11 Months
Salary	
Current Year	\$37,200.00 (12 months)
Previous Year	\$36,800.00 (12 months)
Previous Year	\$36,000.00 (12 months)
Previous Year	\$0.00 (0 months)
Total	\$110,000.00 (36 months)
3 Year Average	\$36,666.67
ASF Balance	\$44,000.00

Calculation

		3 Year Average Salary	\$36,666.67
(As though the member were age 55)	x	Age Factor (0.025)	
	=	Base	\$916.67
	x	Creditable Service (16.9167)	
	=	Total	\$15,507.03
	÷	12	\$1,292.25
Ordinary Disability Formula Allowance	x	12	\$15,507.00

Opt. A Allowance: Annuity/Pension Allocation

		ASF Balance	\$44,000.00
(Based on member's actual age)	x	Annuity Factor (0.00654)	
	=	Monthly Annuity	\$287.76
	x	12	
	=	Annual Annuity	\$3,453.12
(Annual Allowance - Annual Annuity)		Annual Pension	\$12,053.88
		Annual Allowance	\$15,507.00
		Monthly Allowance	\$1,292.25

All calculations are rounded to the nearest penny.

6. Ordinary Disability Veteran | Option A

Ordinary Disability Veteran | Option A

Fact Pattern

<i>Member's Date of Birth</i>	03/01/1950
<i>Member's Age</i>	57 Years, 10 Months
<i>Member's Sex</i>	M
<i>Job Group</i>	4
<i>Membership Date</i>	01/01/1993
<i>Date of Retirement</i>	01/01/2008
<i>Veteran</i>	Y
<i>Total Creditable Service</i>	15 Years, 0 Months
<i>Salary</i>	
<i>Current Year</i>	\$50,000.00 (12 months)
<i>ASF Balance</i>	\$30,000.00

Calculation

	Annual Salary	\$50,000.00
x	50%	
=	Pension	\$25,000.00
÷	12	\$2,083.33
x	12	\$24,999.96
	Annual Pension	\$24,999.96

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$30,000.00
x	Annuity Factor (0.00733)	
=	Monthly Annuity	\$219.90
x	12	
=	Annual Annuity	\$2,638.80
	Annual Pension	\$24,999.96
	Annual Allowance	\$27,638.76
	Monthly Allowance	\$2,303.23

(Annuity + Pension)

All calculations are rounded to the nearest penny.

7. Section 12(2)(d)

Section 12(2)(d)

Fact Pattern

<i>Member's Date of Birth</i>	01/01/1959
<i>Member's Age</i>	49 Years, 0 Months
<i>Member's Sex</i>	M
<i>Beneficiary DOB</i>	08/01/1949
<i>Job Group</i>	I
<i>Membership Date</i>	02/01/1991
<i>Date of Death</i>	01/01/2008
<i>Veteran</i>	N
<i>Beneficiary Age</i>	58 Years, 5 Months

Since the member was 49 years old on his date of death, we add 6 years to both the member's age (to bring to age 55) and the beneficiary's age in determining the Option C factor.

<i>Option C factor</i>	0.9562
<i>Total Creditable Service</i>	16 Years, 11 Months

Salary

<i>Current Year</i>	\$37,200.00 (12 months)
<i>Previous Year</i>	\$36,800.00 (12 months)
<i>Previous Year</i>	\$36,000.00 (12 months)
<i>Previous Year</i>	\$0.00 (0 months)
<i>Total</i>	\$110,000.00 (36 months)
<i>3 Year Average</i>	\$36,666.67
<i>ASF Balance</i>	\$44,000.00

Section 12(2)(d)

Calculation

		3 Year Average Salary	\$36,666.67
(As though the member were age 55)	x	Age Factor (0.015)	
	=	Base	\$550.00
	x	Creditable Service (16.9167)	
	=	Total	\$9,304.19
	÷	12	\$775.35
Superannuation Formula Allowance (I)	x	12	\$9,304.20

		80% Limitation	\$29,333.34
	÷	12	\$2,444.45
80% Allowance (II)	x	12	\$29,333.40

Opt. A Allowance (lesser of I or II)		Opt. A Allowance	\$9,304.20
	+	Veteran's Benefit	0.00
Total Opt. A Allowance	=	Total Allowance	\$9,304.20

Opt. D Allowance: Annuity/Pension Allocation

(Opt. A Monthly Allowance) \$775.35 x (Opt. C Factor) .9562 = (Monthly Allowance) \$741.39

		Monthly Allowance	\$741.39 <small>(Divisible by 3)</small>
	x	12	
	=	Annual Allowance	\$8,896.68

		ASF Balance	\$44,000.00
(Based on beneficiary's actual age)	x	Annuity Factor (0.00733)	
	=	Monthly Annuity	\$322.52
	x	12	
	=	Annual Annuity	\$3,870.24
(Annual Allowance - Annual Annuity)		Annual Pension	\$5,026.44
		Annual Allowance	\$8,896.68
		Monthly Allowance	\$741.39

All calculations are rounded to the nearest penny.

Section 12(2)(d) | Veteran

Fact Pattern

<i>Member's Date of Birth</i>	01/01/1959
<i>Member's Age</i>	49 Years, 0 Months
<i>Member's Sex</i>	M
<i>Beneficiary DOB</i>	08/01/1949
<i>Job Group</i>	I
<i>Membership Date</i>	02/01/1991
<i>Date of Death</i>	01/01/2008
<i>Veteran</i>	Y
<i>Beneficiary Age</i>	58 Years, 5 Months

Since the member was 49 years old on his date of death, we add 6 years to both the member's age (to bring to age 55) and the beneficiary's age in determining the Option C factor.

<i>Option C factor</i>	0.9562
<i>Total Creditable Service</i>	16 Years, 11 Months

Salary

<i>Current Year</i>	\$37,200.00 (12 months)
<i>Previous Year</i>	\$36,800.00 (12 months)
<i>Previous Year</i>	\$36,000.00 (12 months)
<i>Previous Year</i>	\$0.00 (0 months)
<i>Total</i>	\$110,000.00 (36 months)
<i>3 Year Average</i>	\$36,666.67
<i>ASF Balance</i>	\$44,000.00

Section 12(2)(d) | Veteran

Calculation

		3 Year Average Salary	\$36,666.67
(As though the member were age 55)	x	Age Factor (0.015)	
	=	Base	\$550.00
	x	Creditable Service (16.9167)	
	=	Total	\$9,304.19
	÷	12	\$775.35
Superannuation Formula Allowance (I)	x	12	\$9,304.20
<hr/>			
		80% Limitation	\$29,333.34
	÷	12	\$2,444.45
80% Allowance (II)	x	12	\$29,333.40
<hr/>			
Opt. A Allowance (lesser of I and II)		Opt. A Allowance	\$9,304.20
	+	Veteran's Benefit *	\$255.00
Total Opt. A Allowance	=	Total Allowance	\$9,559.20

Opt. D Allowance: Annuity/Pension Allocation

(Opt. A Mon. All. (Less Vet.'s Ben.)) \$775.35 x (Opt. C Fact.) .9562 + (Mon. Vet's Ben.) \$21.25 = (Monthly Allowance) \$762.64

		Monthly Allowance	\$762.63 <small>(Divisible by 3)</small>
	x	12	
	=	Annual Allowance	\$9,151.56

		ASF Balance	\$44,000.00
(Based on beneficiary's actual age)	x	Annuity Factor (0.00733)	
	=	Monthly Annuity	\$322.52
	x	12	
	=	Annual Annuity	\$3,870.24
(Annual Allowance - Annual Annuity)		Annual Pension	\$5,281.32
		Annual Allowance	\$9,151.56
		Monthly Allowance	\$762.63

All calculations are rounded to the nearest penny.

* \$15/year for every year of service or fraction thereof.

Section 12(2)(d) | Veteran | Minimum

Fact Pattern

<i>Member's Date of Birth</i>	01/01/1959
<i>Member's Age</i>	49 Years, 0 Months
<i>Member's Sex</i>	M
<i>Beneficiary DOB</i>	08/01/1949
<i>Job Group</i>	I
<i>Membership Date</i>	02/01/2004
<i>Date of Death</i>	01/01/2008
<i>Veteran</i>	Y
<i>Beneficiary Age</i>	58 Years, 5 Months

Since the member was 49 years old on his date of death, we add 6 years to both the member's age (to bring to age 55) and the beneficiary's age in determining the Option C factor.

<i>Option C factor</i>	0.9562
<i>Total Creditable Service</i>	3 Years, 11 Months

Salary

<i>Current Year</i>	\$37,200.00 (12 months)
<i>Previous Year</i>	\$36,800.00 (12 months)
<i>Previous Year</i>	\$36,000.00 (12 months)
<i>Previous Year</i>	\$0.00 (0 months)
<i>Total</i>	\$110,000.00 (36 months)
<i>3 Year Average</i>	\$36,666.67
<i>ASF Balance</i>	\$14,000.00

Section 12(2)(d) | Veteran | Minimum

Calculation

		3 Year Average Salary	\$36,666.67
	x	Age Factor (0.015)	
	=	Base	\$550.00
	x	Creditable Service (3.9167)	
	=	Total	\$2,154.19
	÷	12	\$179.52
<i>Superannuation Formula Allowance (I)</i>	x	12	\$2,154.24
<hr/>			
		80% Limitation	\$29,333.34
	÷	12	\$2,444.45
<i>80% Allowance (II)</i>	x	12	\$29,333.40
<hr/>			
<i>Opt. A Allowance (lesser of I or II)</i>		Opt. A Allowance	\$2,154.24
	+	Veteran's Benefit *	\$60.00
<i>Total Opt. A Allowance</i>	=	Total Allowance	\$2,214.24

Opt. D Allowance: Annuity/Pension Allocation

(Opt. A Mon. All. (Less Vet.'s Ben.)) \$179.52 x (Opt. C Fact.) .9562 = (Monthly Allowance) \$171.66

		Monthly Allowance	\$171.66	<i>(Divisible by 3)</i>
	x	12		
	=	Annual Allowance	\$2,059.92	I
		Monthly Minimum Allowance	\$250.00	
		Minimum Allowance	\$3,000.00	II
<i>(Greater of I or II)</i>		Total Allowance	\$3,000.00	III
		Veteran's Benefit	\$60.00	IV

		ASF Balance	\$14,000.00
<i>(Based on beneficiary's actual age)</i>	x	Annuity Factor (0.00733)	
	=	Monthly Annuity	\$102.62
	x	12	
	=	Annual Annuity	\$1,231.44
<i>(Annual Allowance ((III) + (IV)) - Annual Annuity)</i>		Annual Pension	\$1,828.56
		Annual Allowance	\$3,060.00
		Monthly Allowance	\$255.00

All calculations are rounded to the nearest penny.

* \$15/year for every year of service or fraction thereof.

8. Termination Allowance | Option A

Termination Allowance | Option A

Fact Pattern

Member's Date of Birth	01/07/1955
Member's Age	53 Years, 5 Months
Member's Sex	F
Job Group	I
Membership Date	08/01/1983
Date of Retirement	07/01/2008
Veteran	N
Total Creditable Service	24 Years, 11 Months
Salary	
Current Year	\$9,800.00 (6 months)
Previous Year	\$18,900.00 (12 months)
Previous Year	\$18,200.00 (12 months)
Previous Year	\$17,500.00 (12 months)
Previous Year	\$16,800.00 (12 months)
Previous Year	\$8,050.00 (6 months)
Total	\$89,250.00 (60 months)
5 Year Average *	\$17,850.00
ASF Balance	\$20,000.00

* 5 year average must be used unless the Local Option for a three year average has been accepted.

Calculation

	5 Year Average Salary	\$17,850.00
	x (1/3)	
	= Pension	\$5,950.00
	÷ 12	\$495.83
	x 12	\$5,949.96
	= Veteran's Benefit:	\$0.00
Termination Formula Pension	= Total Pension	\$5,949.96

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$20,000.00
	x Annuity Factor (0.00683)	
	= Monthly Annuity	\$136.60
	x 12	
	= Annual Annuity	\$1,639.20
	Annual Pension	\$5,949.96
(Annual Annuity + Annual Pension)	Annual Allowance	\$7,589.16
	Monthly Allowance	\$632.43

All calculations are rounded to the nearest penny.

9. Pop-Up

Pop-Up

Fact Pattern

The Option A and Option C retirement allowances below were determined in a similar manner to the Superannuation Option C exhibit. This retiree is a non-veteran.

Member's Date of Birth	12/07/1949
Member's Age	55 Years, 5 Months
Member's Sex	M
Beneficiary Date of Birth	12/07/1946
Job Group	I
3-Year Average Salary	\$55,000.00
Membership Date	07/01/1987
Date of Retirement	06/01/2005
Veteran	N
Beneficiary Age	58 Years, 5 Months
Total Creditable Service	17.9167

Option (C) Factor: 0.9421

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$60,000.00
	x Annuity Factor (0.00701)	
	= Monthly Annuity	\$420.60
	x 12	
	= Annual Annuity	\$5,047.20
(Annual Allowance - Annual Annuity)	Annual Pension	\$9,734.04
	Annual Allowance	\$14,781.24
	Monthly Allowance	\$1,231.77

Opt. C Allowance: Annuity/Pension Allocation

	Monthly	Annual
Annuity	\$396.24	\$4,754.88
Pension	\$764.22	\$9,170.64
Allowance	\$1,160.46	\$13,925.52

Pop-Up (continued)

His beneficiary of record died on October 15, 2007. He received two Cost of Living Adjustments (COLAs) since he retired:

2006 COLA: \$360.00
 2007 COLA: \$360.00

So his allowance, payable on the date of his beneficiary's death, was \$14,645.52

To calculate how his allowance would "pop-up", follow these steps:

Take the allowance payable on the beneficiary's date of death and multiply it by the amount the retiree would have received if he had chosen Option A when he retired. Divide this product by the amount the retiree actually received when he retired under Option C. This amount is the new allowance for the retiree.

$$\$14,645.52 \times \$14,781.24 / \$13,925.52 = \$15,545.48$$

"Popped-up" Opt. A Allowance: Annuity/Pension Allocation		
(From Opt. (A))	Annual Annuity	\$5,047.20
(Annual Allowance - Annual Annuity)	Annual Pension	\$10,498.32
(Calculated above)	Annual Allowance	\$15,545.52
	Monthly Allowance	\$1,295.46

Fact Pattern for Pop-Up | Veteran

Fact Pattern

The Option A and Option C retirement allowances below were determined in a similar manner to the Superannuation Option C exhibit. This retiree is a veteran.

Member's Date of Birth	03/01/1947
Member's Age	57 Years, 10 Months
Member's Sex	M
Beneficiary Date of Birth	08/01/1946
Job Group	4
3-Year Average Salary	\$49,000.00
Membership Date	01/01/1970
Date of Retirement	01/01/2005
Veteran	Y
Beneficiary Age	58 Years, 5 Months
Total Creditable Service	35.0000

Option (C) Factor : 0.9224

Opt. A Allowance: Annuity/Pension Allocation

	ASF Balance	\$78,000.00
	x Annuity Factor (0.00733)	
	= Monthly Annuity	\$571.74
	x 12	
	= Annual Annuity	\$6,860.88
(Annual Allowance - Annual Annuity)	Annual Pension	\$32,639.16
(Includes the \$300 Veteran's Benefit)	Annual Allowance	\$39,500.04
	Monthly Allowance	\$3,291.67

Opt. C Allowance: Annuity/Pension Allocation

	Monthly	Annual
Annuity	\$527.37	\$6,328.44
Pension	\$2,510.82	\$30,129.84
Allowance	\$3,038.19	\$36,458.28

Pop-Up | Veteran (*continued*)

His beneficiary of record died on October 15, 2007. He received two Cost of Living Adjustments (COLAs) since he retired:

2006 COLA: \$360.00

2007 COLA: \$360.00

So his allowance, payable on the date of his beneficiary's death, was \$37,178.28

To calculate how his allowance would "pop-up", follow these steps:

Take the allowance payable on the beneficiary's date of death (less the veteran's benefit) and multiply it by the amount the retiree would have received if he chose Option A when he retired (less veteran's benefit). Divide this product by the amount the retiree actually received when he retired under Option C (Less the veteran's benefit). Add in the veteran's benefit. This amount is the new allowance for the retiree.

$$\$36,878.28 \times \$39,200.04 / \$36,158.28 = \$39,980.61 (+ \$300 \text{ Veteran's Benefit}) = \$40,280.61$$

"Popped-up" Opt. A Allowance: Annuity/Pension Allocation

(From Opt. (A))	Annual Annuity	\$6,860.88
(Annual Allowance - Annual Annuity)	Annual Pension	\$33,419.76
(Calculated above)	Annual Allowance	\$40,280.64
	Monthly Allowance	\$3,356.72

10. Notes & Definitions

Allowance A public employee retirement allowance consists of two parts: an annuity and a pension.

Annuity The contributions that are deducted during the course of a member's creditable service are deposited for the member in an Annuity Savings Fund account (ASF) by the retirement board. The interest that is credited on these contributions is credited to the member's individual account. That part of the member's retirement allowance that is based on the total amount in the annuity savings account on the date of retirement is the annuity.

Annuity calculations are based on the member's ASF balance, age, and the option selected.

Disability Retirement

Accidental Disability

Eligibility: Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

Retirement Allowance: 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay. For those who became members in service after January 1, 1988 or who have not been members in service continually since that date, the amount is limited to 75% of pay. There is an additional pension of \$667.92 (as of July 1, 2007) per year (or \$312.00 per year in systems in which the local option contained in G.L. c. 32, s.7(2)(a)(iii) has not been adopted), per child who is under 18 at the time of the member's retirement, with no age limitation if the child is mentally or physically incapacitated from earning. The additional pension may continue up to age 21 for any child who is a full-time student at an accredited educational institution.

Ordinary Disability

Eligibility: Non-veterans who become totally and permanently disabled by reason of a non-job related condition with at least ten years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L.c.32, s.6(l) has not been adopted).

Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job related condition prior to reaching "maximum age".

Retirement Allowance: If the member is not a veteran, the ordinary disability allowance is equal to an accrued superannuation retirement benefit, calculated as if the member was age 55. If the member is a veteran, the benefit is 50% of

the member's final rate of regular compensation during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

“Option” is the term used to describe how a retirement allowance is allotted. A retirement allowance must be paid in lifetime monthly payments, but the apportionment of those payments will differ depending upon option selection. Option choice also determines what benefits, if any, will be paid to survivors after a retiree's death.

Options A, B, & C

Option A

Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the retiree's death. No benefits will be provided for the retiree's survivors.

Option B

Option B provides a retiree with a lifetime allowance that is approximately 2% to 5% less per month than Option A. The allowance is payable in monthly installments, commences at retirement and terminates upon the death of the retiree, provided, however, that if the total amount of the annuity portion received by the retiree is less than the amount of his/her accumulated deductions, including interest, the difference or balance of his/her accumulated deductions will be paid in a lump sum to the retiree's beneficiary or beneficiaries of choice.

An Option B retirement allowance is calculated by taking the pension amount as calculated under Option A and adding it to the annuity calculated under Option B.

Option C

Option C is also known as the joint and last survivor allowance. Selection of this option means that the allowance payments received during a retiree's lifetime would be approximately 10% less than those received under Option A. This allowance, payable in monthly installments, commences at retirement. At the death of the retired employee, 2/3 of the allowance is payable to the member's designated beneficiary (who may be the spouse, or former spouse who remains unmarried for a member whose retirement becomes effective on or after February 2, 1992, child, parent, sister, or brother of the employee) for the life of the beneficiary.

The monthly Option C allowance is calculated by taking the monthly Option A allowance and multiplying it by a joint factor that is based on both the retiree's and beneficiary's ages.

**Option C
“Pop Up”**

If a retiree’s allowance was as the result of an application filed on or after January 12, 1988 and the Option C beneficiary dies on or after that date and before the retiree dies, the retiree will thereafter be paid the full retirement allowance that would have been received had Option A been elected at the time the retirement allowance became effective. This conversion is commonly referred to as the Option C “Pop-Up”. Any cost of living increases that have been granted since the retiree’s Option C retirement became effective will be reflected in the newly established Option A allowance. All payments will cease upon the retiree’s death.

For retirees whose retirement became effective before January 12, 1988 and who chose Option C and are predeceased by their beneficiaries, extension of the Option C “Pop-Up” benefit is determined by their respective retirement board’s (and relevant “legislative body’s”) acceptance of Section 288 of Chapter 194 of the Acts of 1998. Under Section 288, such adjustments must be made prospectively from July 1, 1998. No payment can be made relative to the period, if any, from the date of the death of the beneficiary to July 1, 1998.

Pension

A pension is the difference between the total retirement allowance specified by law and the amount provided by employee contributions.

**Section
12(2)(d)**

A Section 12(2)(d) allowance is an allowance equal to that which would have been payable had the member retired and elected Option C on the day before his or her death. For a death occurring prior to the member’s superannuation retirement age, the age 55 benefit rate is used. The minimum annual allowance payable to the surviving spouse of a member-in-service who dies with at least two years of creditable service is \$3,000, provided that the member and the spouse were married for at least one year and living together on the member’s date of death.

The surviving spouse of such a member-in-service receives an additional allowance equal to the sum of \$1,440 per year for the first child and \$1,080 per year for each additional child until all dependent children reach age 18 or 22 if a full-time student, unless mentally or physically incapacitated.

A member-survivor allowance that is paid to an individual other than the member’s spouse is not brought up to a guaranteed minimum allowance.

Under Section 12(2)(d) an eligible spouse of a deceased member-in-service can elect whether or not to receive a lifetime allowance with dependent benefits, if applicable.

If an eligible spouse or Option D beneficiary chooses not to receive a lifetime benefit, the individual designated by the member on his beneficiary selection form, who may or may not be the eligible spouse or Option D beneficiary, will receive a cash refund of the member’s total accumulated deductions.

Superannuation Retirement

A member is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- Completion of twenty years of 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 service, if hired after 1978, and if classified in Group 1 or 2.

A member's annual superannuation retirement allowance is determined by multiplying *average salary* by a *benefit rate* related to the member's age and job classification at retirement, and the resulting product by the *creditable service*. The amount determined by the benefit formula cannot exceed 80% of the member's highest three-year average salary. For veterans, as defined in G.L. c. 32, s. 1, there is an additional benefit of \$15 per year for each year of creditable service, up to a maximum of \$300.

Salary is defined as gross regular compensation.

Average salary is the 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.

The *benefit rate* varies with the member's retirement age, but the highest rate of 2.5% applies to Group 1 employees who retire at or after age 65, Group 2 employees who retire at or after age 60, and to Group 4 employees who retire at or after age 55. A one tenth of one percent reduction is applied for each year of age under the maximum age for the member's group. For Group 2 employees who terminate from service under age 55, the benefit rate for a Group 1 employee is used.

In general, a member earns *creditable service* toward his/her retirement allowance for the period during which contributions are made to the retirement system. Creditable service must be measured in full years and completed months. In some cases, part time service will be prorated.

For a termination allowance (Section 10(2)(b)) the pension is equal to one third of the average salary figure (either three or five years, depending on the acceptance of a local option). The annuity is calculated in the routine fashion. The allowance is determined by adding the annuity and pension together.

Termination Allowance

Veteran

If you are a veteran, as defined in section one of Chapter 32 and retired under superannuation, if you die as a member-in-service and provide a section 12(2)(d) benefit, or if you retire under a termination allowance, you will receive \$15 a year extra for every year or fraction thereof of creditable service, up to a maximum additional benefit of \$300 a year. Veterans can still receive this additional veteran's benefit even if it causes their superannuation retirement allowance to exceed 80% of their average annual rate of regular compensation.

Veterans who have completed ten years of membership service may be entitled to purchase creditable service for military service rendered before becoming public employees or while on leave from public service.

"Veteran" shall mean any person, male or female, including a nurse, (A) whose last discharge or release from wartime service, was under honorable conditions and who (B) served in the Army, Navy, Marine Corps, Coast Guard, or Air Force of the United States for not less than ninety days of active service, at least one day of which was for wartime service, provided, thee any person who so served in wartime and was awarded a service- connected disability or a purple heart, or who died in such service under conditions other than dishonorable, shall be deemed to be a veteran notwithstanding his failure to complete ninety days of active service.

"Wartime service" shall mean service performed by a "Spanish war veteran", a "World War I veteran", a "World War II veteran", a "Korean veteran", a "Vietnam veteran", a "Lebanese Peace Keeping Force veteran," a "Grenada Rescue Mission veteran," a "Panamanian Intervention Force Veteran", a "Persian Gulf veteran", or a member of the "WAAC", during any of the periods of time described herein or for which such medals described below are awarded.

"World War II veteran" shall mean any veteran who performed such wartime service between September sixteenth, nineteen hundred and forty and December thirty-first, nineteen hundred and forty-six.

"Korean veteran" shall mean any veteran who performed such wartime service between June twenty-fifth, nineteen hundred and fifty and January thirty-first, nineteen hundred and fifty-five, both dates inclusive."

"Vietnam veteran" shall mean (1) any person who performed such wartime service during the period commencing August fifth, nineteen hundred and sixty-four and ending on May 7, 1975 or (2) any person who served at least one hundred and eighty days of active service in the Armed Forces of the United States during the period between February first, nineteen hundred and fifty-five and August fourth, nineteen hundred and sixty-four, except that any such person who served in said armed forces during said period and was awarded a service-connected disability or a purple heart, or who died in said service under conditions other than dishonorable, shall be deemed to be a veteran notwithstanding his failure to complete one hundred and eighty days of active service.

“Lebanese Peace Keeping Force veteran” shall mean any person who performed such wartime service and received a campaign medal for such service during the period commencing August twenty-fifth, nineteen hundred and eighty-two and ending when the President of the United States shall have withdrawn armed forces from the country of Lebanon.

“Grenada Rescue Mission Veteran” shall mean any person who performed such wartime service and received a campaign medal for such service during the period commencing October twenty-fifth, nineteen hundred and eighty-three to December fifteenth, nineteen hundred and eighty three, inclusive.

“Panamanian Intervention Force Veteran” shall mean any person who performed such wartime service and received a campaign medal for such service during the period commencing December twentieth, nineteen hundred and eighty-nine and ending January thirty-first, nineteen hundred and ninety.

“Persian Gulf Veteran” shall mean any person who performed such wartime service during the period commencing August second, nineteen hundred and ninety and ending on a date to be determined by Presidential Proclamation or Executive Order and Concurrent Resolution of the Congress of the United States.

“WAAC” shall mean any woman who was discharged and so served in any corps or unit of the United States established for the purpose of enabling women to serve with, or as auxiliary to, the Armed Forces of the United States and such woman shall be deemed to be a veteran.

“Veteran” shall also include any person who, instead of having performed “war-time service” as defined previously, has been awarded the Congressional Medal of Honor or one of the following campaign badges, Second Nicaraguan Campaign, Yangtze Service, Navy occupation, Service Army of Occupation or Medal of Humane Action: or has performed active service in the Armed Forces of the United States at any time between April sixth, nineteen hundred and seventeen and November eleventh, nineteen hundred and eighteen, inclusive.

None of the following shall be deemed to be a “Veteran”:

(A) Any person who at the time of entering into the Armed Forces of the United States had declared his intention to become a subject or citizen of the United States and withdrew his intention under the provisions of the Act of Congress approved July ninth, nineteen hundred and eighteen.

(B) Any person who was discharged from the said armed forces on his own application or solicitation by reason of his being an enemy alien.

(C) Any person who has been proven guilty of willful desertion.

Veteran
(continued)

(D) Any person whose only service in the Armed Forces of the United States consists of his service as a member of the Coast Auxiliary or as a temporary member of the Coast Guard Reserve, or both.

(E) Any person whose last discharge or release from the Armed Forces is dishonorable.

“Armed Forces” shall include Army, Navy, Marine Corps, Air Force and Coast Guard.

“Active Service in the Armed Forces”, shall not include active duty for training in the Army National Guard or Air National Guard or active duty for training as a reservist in the Armed Forces of the United States.

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