

NEW YORK CITY RETIREMENT SYSTEMS
ACTUARIAL AUDIT AND RELATED REVIEW SERVICES
INDEPENDENT ACTUARY'S STATEMENT

Prepared by:
Gabriel, Roeder, Smith & Company
October 2015

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The Honorable Scott M. Stringer
Comptroller of the City of New York
One Centre Street
New York, New York 10007

Re: Independent Actuary's Certification Regarding the Funding of the Five Actuarially-Funded New York City Retirement Systems ("NYCRS")

Dear Comptroller Stringer:

Gabriel, Roeder, Smith & Company (GRS) was retained to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of the following five actuarial pension funds (collectively NYCRS or the Systems):

- New York City Employees' Retirement System (NYCERS)
- Teachers' Retirement System of the City of New York (TRS)
- Board of Education Retirement System of the City of New York (BERS)
- New York City Police Pension Fund (POLICE)
- New York Fire Department Pension Fund (FIRE)

GRS was required to conduct two consecutive biennial actuarial engagements, encompassing the following:

- Biennial Contribution Audits of the computed employer contributions for each System in NYCRS for fiscal years 2012 and 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Biennial Experience Studies for the periods ending June 30, 2011 and June 30, 2013, for each System in NYCRS;
- Two Administrative Reviews of the data gathering and maintenance practices of the Office of the Actuary (OA) and each System in NYCRS (one review corresponding with each Contribution Audit); and
- Two Independent Actuarial Statements (one for each engagement); GRS, as the independent actuarial auditor, will submit a statement that will briefly describe the scope of the entire engagement, will review the entire engagement and comment on the financial condition and financing progress and policies of each System, and certify that the Systems are being funded on sound actuarial, financial, and legal bases.

This report constitutes the deliverable with respect to the Independent Actuarial Statement for the second engagement. The purpose of this report is to:

- Summarize the findings from the Contribution Audit, the Experience Study and the Administrative Review from the second engagement; and
- Provide each System with a certification of the findings of the second engagement.

The Actuarial Contribution Audit provides an independent verification of the computation of employer pension contributions – including the methodologies used therein and their conformity to law, the assumptions adopted by the Systems, and generally accepted actuarial principles. The Experience Studies review and comment on the continued appropriateness of the actuarial assumptions used in the computations of employer contributions and identify areas where assumptions may be improved. The Administrative Review evaluates the actuarial data gathering process to ensure that the data collection methods produce sufficiently accurate data for valuation and Experience Study purposes. Thus the three components of the assignment provide assurance that:

- Assets and liabilities are calculated accurately, using appropriate actuarial assumptions and methods, and are based on sufficient and accurate census data; and
- Employer contribution amounts are computed in conformity with all applicable financial, actuarial and legal requirements.

GRS' Conclusions

Administrative Review:

GRS has concluded that the data used by the OA to determine employer pension contributions for FY 2014 and develop actuarial assumptions was sufficiently complete and accurate for those purposes.

Contribution Audit:

Through a valuation replication and review of individual test life cases, GRS has confirmed that the OA's calculations of the FY 2014 employer contribution for all Systems were reasonable and appropriate.

Experience Study:

Although actual experience did differ from assumptions in some instances, GRS has concluded that the assumptions used in the June 30, 2012 (Lag) Actuarial Valuations were reasonable.

Accordingly, GRS is pleased to certify that the Systems are being funded in conformity with all applicable actuarial, financial and statutory requirements.

As part of the Experience Study, GRS observed some differences between current assumed activity and actual activity during the study period. As a result, we recommend the OA consider following changes to the assumptions:

- Lower Investment Return Assumption;
- Lower rates of mortality;
- Recognition of improvement in mortality through the use of generational tables;
- Adjustments in assumed rates of turnover, disability and retirement; and
- Adjustments to the pay increase and overtime assumptions.

The recommended changes in economic and mortality assumptions are similar for all the Systems. The recommendations for the other assumptions vary by System.

Organization of this Report

Section A	Independent Actuary's Statement for the New York City Employees' Retirement System (NYCERS)
Section B	Independent Actuary's Statement for the Teachers' Retirement System of the City of New York (TRS)
Section C	Independent Actuary's Statement for the Board of Education Retirement System of the City of New York (BERS)
Section D	Independent Actuary's Statement for the New York City Police Pension Fund (POLICE)
Section E	Independent Actuary's Statement for the New York Fire Department Pension Fund (FIRE)

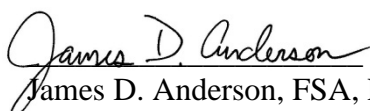
We would like to thank the Office of the Comptroller, the Office of the Actuary and the staff of each of the Systems for hosting our visits, supplying the information on which this study was based and reviewing initial drafts. This report could not have been completed without their assistance. They (all) were accommodating, informative and helpful.

James D. Anderson, Joseph P. Newton and Daniel J. White are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

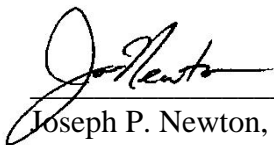
Respectfully Submitted,



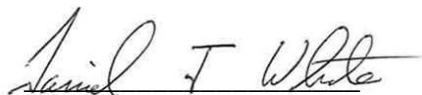
Kenneth G. Alberts
Project Manager and Contribution Audit Director



James D. Anderson, FSA, EA, MAAA
Alternate Project Manager and Peer Review Actuary



Joseph P. Newton, FSA, EA, MAAA
Alternate Project Manager and Experience Study Director



Daniel J. White, FSA, EA, MAAA
Experience Study Director

10/23/2015

SECTION A

INDEPENDENT ACTUARY'S STATEMENT FOR THE
NEW YORK CITY EMPLOYEES' RETIREMENT
SYSTEM (NYCERS)

Independent Actuary's Statement for the New York City Employees' Retirement System (NYCERS)

Gabriel, Roeder, Smith & Company (GRS) was retained by the Comptroller to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of the NYCERS.

GRS has completed the following:

- A Contribution Audit of the computed employer contributions for NYCERS for fiscal year 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Experience Studies for the 4-year and 10-year periods ending June 30, 2013 for NYCERS; and
- An Administrative Review of the data gathering and maintenance practices of the Office of the Actuary (OA) and NYCERS.

Based on the Contribution Audit, the Experience Studies, and the Administrative Review for NYCERS, GRS certifies that NYCERS is being funded in accordance with Standards of Practice prescribed by the Actuarial Standards Board and in conformity with the applicable New York State and New York City Statutes. Assuming continued funding of NYCERS by the City/Obligors on the basis used in the June 30, 2012 (Lag) Actuarial Valuation, we believe the City's funding objective (that these statutorily required contributions, together with member contributions and assumed investment income will be sufficient to pay benefits when due) will be achieved.

Employer Contribution Audit for Fiscal Year 2014

GRS has performed an actuarial audit of the June 30, 2012 (Lag) Actuarial Valuation which develops the employer contributions for Fiscal Year 2014. This actuarial audit included:

- A review of actuarial methods and assumptions;
- A replication of the valuation (using GRS software) to verify the computations of Actuarial Value of Assets, Actuarial Liabilities and Employer Contributions; and
- A review of several test life cases to validate the programming and software used by the OA to perform the valuation.

GRS has concluded the following:

- Actuarial methods and assumptions adopted by the Board and used in the June 30, 2012 (Lag) Actuarial Valuation were reasonable, appropriate and in accordance with generally accepted actuarial standards of practice, including:
 - The use of the Entry Age Actuarial Cost Method;
 - The Actuarial Asset Valuation Method; and
 - The demographic and economic assumptions.

- The mathematical computations performed by the OA in the June 30, 2012 (Lag) Actuarial Valuation were appropriate and correct and GRS was able to independently replicate the computation of the employer contributions within less than 2%; and
- In GRS' review of test cases, GRS was able to confirm that the software used by the OA was generally programmed correctly and based on the methods and assumptions adopted by the Board, encoded in Statute or determined by the Actuary, as appropriate (any exceptions were minor, did not materially affect the results and were identified for the OA to review).

Additional details along with GRS' suggestions for improving the valuation can be found in our Actuarial Audit of Employer Contributions report for Fiscal Year 2014 dated October 23, 2015.

Administrative Review

GRS has completed the Administrative Review, which included:

- A meeting with OA staff to discuss the data collection process and the benefit calculation/certification process;
- A meeting with NYCERS staff to discuss the data collection process and the benefit calculation/certification process; and
- A walk through NYCERS to review security measures taken to ensure the security of sensitive member data.

GRS has concluded the following:

- The data gathering process used by the OA produced data that was sufficiently accurate for use in the Actuarial Valuation and Experience Study;
- Transmission and storage of sensitive member data is done in a secure and appropriate manner; and
- Communications between the OA and NYCERS are on excellent terms and have fostered a cooperative and productive relationship.

Additional details along with GRS' suggestions for improving the data collection process can be found in our Administrative Review report dated October 9, 2015.

Experience Study

GRS has completed the Experience Study for the 4-year and 10-year periods ending June 30, 2013. This process involved collecting the Experience Study database developed by the prior Independent Actuary, updating and maturing the data based on the valuation data used in the June 30, 2012 and June 30, 2013 actuarial valuations and comparing assumed experience to actual experience. Although the findings indicate that several assumptions differed from experience, GRS believes that:

- The economic assumptions used for the NYCERS June 30, 2012 (Lag) valuation are reasonable and appropriate; and
- The demographic assumptions used are reasonable and appropriate.

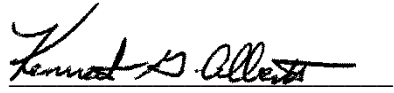
GRS recommends the OA consider changes in the following areas for future valuations:

- Reduce Investment Return Assumption
- Reduce rates of mortality and update the provision for future mortality improvement
- Salary Increase Assumptions
 - For General group: decrease the general portion of the salary increase assumption
 - For other groups: increase the general portion of the salary increase and flatten the merit portion
 - OA should temper the above based on the increases called for in the new labor agreements
- Withdrawal
 - Increase assumed withdrawals to half way between current assumption and actual experience
 - Further increases will be likely in next study
- Disability: recommend minor changes based on each group's experience
- Retirement: reflect delays in retirement as seen in data (and also nationwide)

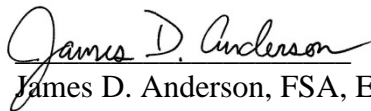
Additional details can be found in our Experience Study report dated October 23, 2015.

James D. Anderson, Joseph P. Newton and Daniel J. White are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

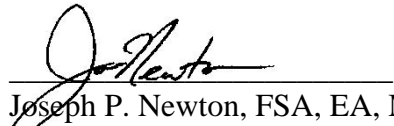
Respectfully Submitted,



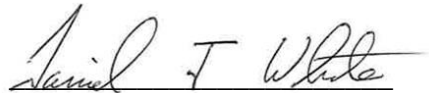
Kenneth G. Alberts
Project Manager and Contribution Audit Director



James D. Anderson, FSA, EA, MAAA
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Joseph P. Newton, FSA, EA, MAAA
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Daniel J. White, FSA, EA, MAAA
Experience Study Director

10/23/2015

SECTION B

INDEPENDENT ACTUARY'S STATEMENT FOR THE
TEACHERS' RETIREMENT SYSTEM OF THE CITY OF
NEW YORK (TRS)

Independent Actuary's Statement for the Teachers' Retirement System of the City of New York (TRS)

Gabriel, Roeder, Smith & Company (GRS) was retained by the Comptroller to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of the TRS.

GRS has completed the following:

- A Contribution Audit of the computed employer contributions for TRS for fiscal year 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Experience Studies for the 4-year and 10-year periods ending June 30, 2013 for TRS; and
- An Administrative Review of the data gathering and maintenance practices of the Office of the Actuary (OA) and TRS.

Based on the Contribution Audit, the Experience Studies, and the Administrative Review for TRS, GRS certifies that TRS is being funded in accordance with Standards of Practice prescribed by the Actuarial Standards Board and in conformity with applicable New York State and New York City Statutes. Assuming continued funding of TRS by the City/Obligors on the basis used in the June 30, 2012 (Lag) Actuarial Valuation, we believe the City's funding objective (that these statutorily required contributions, together with member contributions and assumed investment income will be sufficient to pay benefits when due) will be achieved.

Employer Contribution Audit for Fiscal Year 2014

GRS has performed an actuarial audit of the June 30, 2012 (Lag) Actuarial Valuation which develops the employer contributions for Fiscal Year 2014. This actuarial audit included:

- A review of actuarial methods and assumptions;
- A replication of the valuation (using GRS software) to verify the computations of Actuarial Value of Assets, Actuarial Liabilities and Employer Contributions; and
- A review of several test life cases to validate the programming and software used by the OA to perform the valuation.

GRS has concluded the following:

- Actuarial methods and assumptions adopted by the Board and used in the June 30, 2012 (Lag) Actuarial Valuation were reasonable, appropriate and in accordance with generally accepted actuarial standards of practice, including:
 - The use of the Entry Age Actuarial Cost Method;
 - The Actuarial Asset Valuation Method; and
 - The demographic and economic assumptions.

- The mathematical computations performed by the OA in the June 30, 2012 (Lag) Actuarial Valuation were appropriate and correct and GRS was able to independently replicate the computation of the employer contributions within 4%; and
- In GRS' review of test cases, GRS was able to confirm that the software used by the OA was generally programmed correctly and based on the methods and assumptions adopted by the Board, encoded in Statute or determined by the Actuary, as appropriate (any exceptions were minor, did not materially affect the results and were identified for the OA to review).

Additional details along with GRS' suggestions for improving the valuation can be found in our Actuarial Audit of Employer Contributions report for Fiscal Year 2014, dated October 23, 2015.

Administrative Review

GRS has completed the Administrative Review, which included:

- A meeting with OA staff to discuss the data collection process and the benefit calculation/certification process;
- A meeting with TRS staff to discuss the data collection process and the benefit calculation/certification process; and
- A walk through TRS to review security measures taken to ensure the security of sensitive member data.

GRS has concluded the following:

- The data gathering process used by the OA produced data that was sufficiently accurate for use in the Actuarial Valuation and Experience Study;
- Transmission and storage of sensitive member data is done in a secure and appropriate manner; and
- Communications between the OA and TRS are on excellent terms and have fostered a cooperative and productive relationship.

Additional details along with GRS' suggestions for improving the data collection process can be found in our Administrative Review report dated October 9, 2015.

Experience Study

GRS has completed the Experience Study for the 4-year and 10-year periods ending June 30, 2013. This process involved collecting the Experience Study database developed by the prior Independent Actuary, updating and maturing the data based on the valuation data used in the June 30, 2012 and June 30, 2013 actuarial valuations and comparing assumed experience to actual experience. Although the findings indicate that several assumptions differed from experience, GRS believes that:

- The economic assumptions used for the TRS June 30, 2012 (Lag) valuation are reasonable and appropriate; and
- The demographic assumptions are reasonable and appropriate.

GRS recommends the OA consider changes in the following areas for future valuations:

- Reduce Investment Return Assumption
- Reduce rates of mortality and update the provision for future mortality improvement
- Withdrawal
 - Increase assumed withdrawals to half way between current assumption and actual experience
 - Further increases will be likely in next study
- Disability: substantially increase rates of both ordinary and accidental disability
- Retirement: reflect delays in retirement as seen in data (and also nationwide)

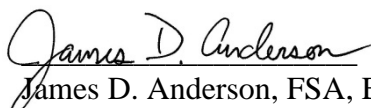
Additional details can be found in our Experience Study report dated October 23, 2015.

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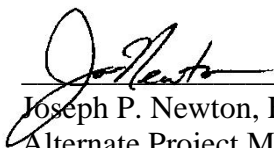
Respectfully Submitted,



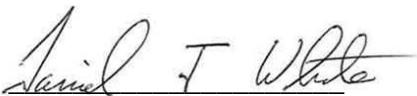
Kenneth G. Alberts
Project Manager and Contribution Audit Director



James D. Anderson, FSA, EA, MAAA
Alternate Project Manager and Peer Review Actuary



Joseph P. Newton, FSA, EA, MAAA
Alternate Project Manager and Experience Study Director



Daniel J. White, FSA, EA, MAAA
Experience Study Director

10/23/2015

SECTION C

**INDEPENDENT ACTUARY'S STATEMENT FOR THE
BOARD OF EDUCATION RETIREMENT SYSTEM OF
THE CITY OF NEW YORK (BERS)**

Independent Actuary's Statement for the Board of Education Retirement System of the City of New York (BERS)

Gabriel, Roeder, Smith & Company (GRS) was retained by the Comptroller to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of the BERS.

GRS has completed the following:

- A Contribution Audit of the computed employer contributions for BERS for fiscal year 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Experience Studies for the 4-year and 10-year periods ending June 30, 2013 for BERS; and
- An Administrative Review of the data gathering and maintenance practices of the Office of the Actuary (OA) and BERS.

Based on the Contribution Audit, the Experience Studies, and the Administrative Review for BERS, GRS certifies that BERS is being funded in accordance with Standards of Practice prescribed by the Actuarial Standards Board and in conformity with applicable New York State and New York City Statutes. Assuming continued funding of BERS by the City/Obligors on the basis used in the June 30, 2012 (Lag) Actuarial Valuation, we believe the City's funding objective (that these statutorily required contributions, together with member contributions and assumed investment income will be sufficient to pay benefits when due) will be achieved.

Employer Contribution Audit for Fiscal Year 2014

GRS has performed an actuarial audit of the June 30, 2012 (Lag) Actuarial Valuation which develops the employer contributions for Fiscal Year 2014. This actuarial audit included:

- A review of actuarial methods and assumptions;
- A replication of the valuation (using GRS software) to verify the computations of Actuarial Value of Assets, Actuarial Liabilities and Employer Contributions; and
- A review of several test life cases to validate the programming and software used by the OA to perform the valuation.

GRS has concluded the following:

- Actuarial methods and assumptions adopted by the Board and used in the June 30, 2012 (Lag) Actuarial Valuation were reasonable, appropriate and in accordance with generally accepted actuarial standards of practice, including:
 - The use of the Entry Age Actuarial Cost Method;
 - The Actuarial Asset Valuation Method; and
 - The demographic and economic assumptions.

- The mathematical computations performed by the OA in the June 30, 2012 (Lag) Actuarial Valuation were appropriate and correct and GRS was able to independently replicate the computation of the employer contributions within 0.5%; and
- In GRS' review of test cases, GRS was able to confirm that the software used by the OA was generally programmed correctly and based on the methods and assumptions adopted by the Board, encoded in Statute or determined by the Actuary, as appropriate (any exceptions were minor, did not materially affect the results and were identified for the OA to review).

Additional details along with GRS' suggestions for improving the valuation can be found in our Actuarial Audit of Employer Contributions report for Fiscal Year 2014, dated October 23, 2015.

Administrative Review

GRS has completed the Administrative Review, which included:

- A meeting with OA staff to discuss the data collection process and the benefit calculation/certification process;
- A meeting with BERS staff to discuss the data collection process and the benefit calculation/certification process; and
- A walk through BERS to review security measures taken to ensure the security of sensitive member data.

GRS has concluded the following:

- The data gathering process used by the OA produced data that was sufficiently accurate for use in the Actuarial Valuation and Experience Study;
- Transmission and storage of sensitive member data is done in a secure and appropriate manner; and
- Communications between the OA and BERS are on excellent terms and have fostered a cooperative and productive relationship.

Additional details along with GRS' suggestions for improving the data collection process can be found in our Administrative Review report dated October 9, 2015.

Experience Study

GRS has completed the Experience Study for the 4-year and 10-year periods ending June 30, 2013. This process involved collecting the Experience Study database developed by the prior Independent Actuary, updating and maturing the data based on the valuation data used in the June 30, 2012 and June 30, 2013 actuarial valuations and comparing assumed experience to actual experience. Although the findings indicate that several assumptions differed from experience, GRS believes that:

- The economic assumptions used for the BERS valuation are reasonable and appropriate; and
- The demographic assumptions are reasonable and appropriate.

GRS recommends the OA consider changes in the following areas for future valuations:

- Reduce Investment Return Assumption
- Reduce rates of mortality and update the provision for future mortality improvement
- Salary Increase Assumption
 - No specific proposed change to general portion
 - Decrease the select period of the merit increase from 25 years to 10 years
 - Decrease the assumed merit increases from years 6 through 10
- Withdrawal: Increase assumed withdrawals
- Retirement: reflect delays in retirement as seen in data (and also nationwide)

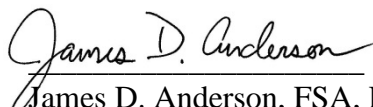
Additional details can be found in our Experience Study report dated October 23, 2015.

James D. Anderson, Joseph P. Newton and Daniel J. White are Members of the American Academy of Actuaries (MAAA) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

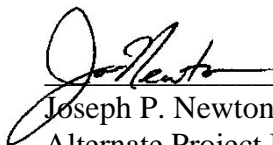
Respectfully Submitted,



Kenneth G. Alberts
Project Manager and Contribution Audit Director



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Alternate Project Manager and Peer Review Actuary



Joseph P. Newton, FSA, EA, MAAA
Alternate Project Manager and Experience Study Director



Daniel J. White, FSA, EA, MAAA
Experience Study Director

10/23/2015

SECTION D

INDEPENDENT ACTUARY'S STATEMENT FOR THE
NEW YORK CITY POLICE PENSION FUND (POLICE)

Independent Actuary's Statement for the New York City Police Pension Fund (POLICE)

Gabriel, Roeder, Smith & Company (GRS) was retained by the Comptroller to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of POLICE.

GRS has completed the following:

- A Contribution Audit of the computed employer contributions for POLICE for fiscal year 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Experience Studies for the 2-year and 10-year periods ending June 30, 2013 for POLICE; and
- An Administrative Review of the data gathering and maintenance practices of the Office of the Actuary (OA) and POLICE.

Based on the Contribution Audit, the Experience Studies, and the Administrative Review for POLICE, GRS certifies that POLICE is being funded in accordance with Standards of Practice prescribed by the Actuarial Standards Board and in conformity with applicable New York State and New York City Statutes. Assuming continued funding of POLICE by the City on the basis used in the June 30, 2012 (Lag) Actuarial Valuation, we believe the City's funding objective (that these statutorily required contributions, together with member contributions and assumed investment income will be sufficient to pay benefits when due) will be achieved.

Employer Contribution Audit for Fiscal Year 2014

GRS has performed an actuarial audit of the June 30, 2012 (Lag) Actuarial Valuation which develops the employer contributions for Fiscal Year 2014. This actuarial audit included:

- A review of actuarial methods and assumptions;
- A replication of the valuation (using GRS software) to verify the computations of Actuarial Value of Assets, Actuarial Liabilities and Employer Contributions; and
- A review of several test life cases to validate the programming and software used by the OA to perform the valuation.

GRS has concluded the following:

- Actuarial methods and assumptions adopted by the Board and used in the June 30, 2012 (Lag) Actuarial Valuation were reasonable, appropriate and in accordance with generally accepted actuarial standards of practice, including:
 - The use of the Entry Age Actuarial Cost Method;
 - The Actuarial Asset Valuation Method; and
 - The demographic and economic assumptions.

- The mathematical computations performed by the OA in the June 30, 2012 (Lag) Actuarial Valuation were appropriate and correct and GRS was able to independently replicate the computation of the employer contributions within 3%; and
- In GRS' review of test cases, GRS was able to confirm that the software used by the OA was generally programmed correctly and based on the methods and assumptions adopted by the Board, encoded in Statute or determined by the Actuary, as appropriate (any exceptions were minor, did not materially affect the results and were identified for the OA to review).

Additional details along with GRS' suggestions for improving the valuation can be found in our Actuarial Audit of Employer Contributions report for Fiscal Year 2014 dated October 23, 2015.

Administrative Review

GRS has completed the Administrative Review, which included:

- A meeting with OA staff to discuss the data collection process and the benefit calculation/certification process;
- A meeting with POLICE staff to discuss the data collection process and the benefit calculation/certification process; and
- A walk through POLICE to review security measures taken to ensure the security of sensitive member data.

GRS has concluded the following:

- The data gathering process used by the OA produced data that was sufficiently accurate for use in the Actuarial Valuation and Experience Study;
- Transmission and storage of sensitive member data is done in a secure and appropriate manner; and
- Communications between the OA and POLICE are on excellent terms and have fostered a cooperative and productive relationship.

Additional details along with GRS' suggestions for improving the data collection process can be found in our Administrative Review report dated October 9, 2015.

Experience Study

GRS has completed the Experience Study for the 4-year and 10-year periods ending June 30, 2013. This process involved collecting the Experience Study database developed by the prior Independent Actuary, updating and maturing the data based on the valuation data used in the June 30, 2012 and June 30, 2013 actuarial valuations and comparing assumed experience to actual experience. Although the findings indicate that several assumptions differed from experience, GRS believes that:

- The economic assumptions used for the POLICE valuation are reasonable and appropriate; and
- The demographic assumptions are reasonable and appropriate.

GRS recommends the OA consider changes in the following areas for future valuations:

- Reduce Investment Return Assumption
- Reduce rates of mortality and update the provision for future mortality improvement
- Salary Increase Assumption
 - Increase the merit portion of the assumption, especially for members with 5 or more years of service
 - Increase the dual overtime assumption to a constant 20% of pay
- Withdrawal: no change recommended at this time, but may need to reduce assumed rates of withdrawal in next experience study if trend in actual experience continues
- Disabilities: decrease rates of assumed disabilities for members eligible for WTC benefits

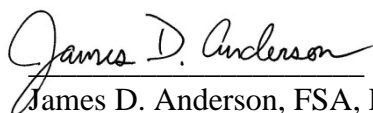
Additional details can be found in our Experience Study report dated October 23, 2015.

James D. Anderson, Joseph P. Newton and Daniel J. White are Members of the American Academy of Actuaries (M.A.A.A.) and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

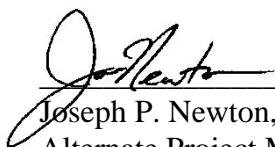
Respectfully Submitted,



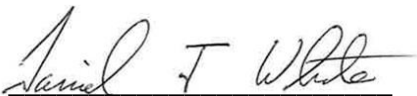
Kenneth G. Alberts
Project Manager and Contribution Audit Director



James D. Anderson, FSA, EA, MAAA
Alternate Project Manager and Peer Review Actuary



Joseph P. Newton, FSA, EA, MAAA
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Daniel J. White, FSA, EA, MAAA
Experience Study Director

10/23/2015

SECTION E

INDEPENDENT ACTUARY'S STATEMENT FOR THE
NEW YORK FIRE DEPARTMENT PENSION FUND
(FIRE)

Independent Actuary's Statement for the New York Fire Department Pension Fund (FIRE)

Gabriel, Roeder, Smith & Company (GRS) was retained by the Comptroller to serve as Independent Actuary under Section 96 of the New York City Charter and provide other services related to the review of the funding of FIRE.

GRS has completed the following:

- A Contribution Audit of the computed employer contributions for FIRE for fiscal year 2014 (including an audit of actuarial accrued liabilities and actuarial valuation of assets);
- Experience Studies for the 4-year and 10-year periods ending June 30, 2013 for FIRE; and
- An Administrative Review of the data gathering and maintenance practices of the Office of the Actuary (OA) and FIRE.

Based on the Contribution Audit, the Experience Studies, and the Administrative Review for FIRE, GRS certifies that FIRE is being funded in accordance with Standards of Practice prescribed by the Actuarial Standards Board and in conformity with applicable New York State and New York City Statutes. Assuming continued funding of FIRE by the City on the basis used in the June 30, 2012 (Lag) Actuarial Valuation, we believe the City's funding objective (that these statutorily required contributions, together with member contributions and assumed investment income will be sufficient to pay benefits when due) will be achieved.

Employer Contribution Audit for Fiscal Year 2014

GRS has performed an actuarial audit of the June 30, 2012 (Lag) Actuarial Valuation which develops the employer contributions for Fiscal Year 2014. This actuarial audit included:

- A review of actuarial methods and assumptions;
- A replication of the valuation (using GRS software) to verify the computations of Actuarial Value of Assets, Actuarial Liabilities and Employer Contributions; and
- A review of several test life cases to validate the programming and software used by the OA to perform the valuation.

GRS has concluded the following:

- Actuarial methods and assumptions adopted by the Board and used in the June 30, 2012 (Lag) Actuarial Valuation were reasonable, appropriate and in accordance with generally accepted actuarial standards of practice, including:
 - The use of the Entry Age Actuarial Cost Method;
 - The Actuarial Asset Valuation Method; and
 - The demographic and economic assumptions.

- The mathematical computations performed by the OA in the June 30, 2012 (Lag) Actuarial Valuation were appropriate and correct and GRS was able to independently replicate the computation of the employer contributions within 0.75%; and
- In GRS' review of test cases, GRS was able to confirm that the software used by the OA was generally programmed correctly and based on the methods and assumptions adopted by the Board, encoded in Statute or determined by the Actuary as appropriate (any exceptions were minor, did not materially affect the results and were identified for the OA to review).

Additional details along with GRS' suggestions for improving the valuation can be found in our Actuarial Audit of Employer Contributions report for Fiscal Year 2014 dated October 23, 2015.

Administrative Review

GRS has completed the Administrative Review, which included:

- A meeting with OA staff to discuss the data collection process and the benefit calculation/certification process;
- A meeting with FIRE staff to discuss the data collection process and the benefit calculation/certification process; and
- A walk through FIRE to review security measures taken to ensure the security of sensitive member data.

GRS has concluded the following:

- The data gathering process used by the OA produced data that was sufficiently accurate for use in the Actuarial Valuation and Experience Study;
- Transmission and storage of sensitive member data is done in a secure and appropriate manner; and
- Communications between the OA and FIRE are on excellent terms and have fostered a cooperative and productive relationship.

Additional details along with GRS' suggestions for improving the data collection process can be found in our Administrative Review report dated October 9, 2015.

Experience Study

GRS has completed the Experience Study for the 2-year and 10-year periods ending June 30, 2013. This process involved collecting the Experience Study database developed by the prior Independent Actuary, updating and maturing the data based on the valuation data used in the June 30, 2012 and June 30, 2013 actuarial valuations and comparing assumed experience to actual experience. Although the findings indicate that several assumptions differed from experience, GRS believes that:

- The economic assumptions used for the FIRE valuation are reasonable and appropriate; and
- The demographic assumptions are reasonable and appropriate.

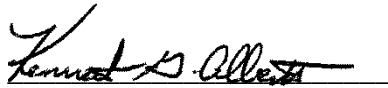
GRS recommends the OA consider changes in the following areas for future valuations:

- Reduce Investment Return Assumption
- Reduce rates of mortality and update the provision for future mortality improvement
- Salary Increase Assumption
 - Increase the merit portion of the assumption, especially for members with 5 or more years of service
 - Increase the dual overtime assumption to a constant 22% of pay
- Disabilities: decrease rates of assumed disabilities for members eligible for WTC benefits

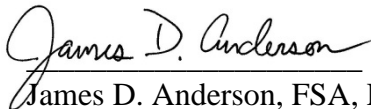
Additional details can be found in our Experience Study report dated October 23, 2015.

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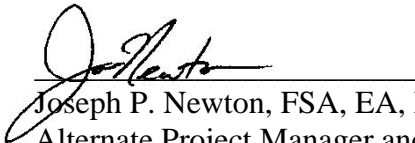
Respectfully Submitted,



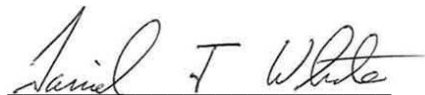
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