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CLERK OF THE BOARD
OF COUNTY COMMISSIONERS
MIAMI-DADE COUNTY, FLORIDA

Memorandum

MIAMI-DADE COUNTY

Date: March 3, 2015

Agenda Item No. 8(F)(8)

Resolution No. R-209-15

To: Honorable Chairman Jean Monestime
and Members, Board of County Commissioners

From: Carlos A. Gimenez
Mayor

R.A. Cuevas, Jr.
County Attorney

Subject: Resolution Approving a Final Settlement Agreement with the Performing Arts Center Trust and PAC Builders for Repairs to the Rain Water Leader System at the Adrienne Arsht Center for the Performing Arts of Miami-Dade County

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Recommendation

It is recommended that the Board of County Commissioners (Board) approve the attached resolution authorizing the County Mayor or County Mayor's designee to execute the attached Final Settlement Agreement (Attachment 1) among Miami-Dade County, the Performing Arts Center Trust (PACT), and Performing Arts Center Builders, J.V. (PAC Builders).

The proposed Final Settlement Agreement does the following:

- Resolves and releases all contested and disputed claims, allegations and assertions among the parties in relation to the water damage to the facility that occurred on May 20, 2012;
- Requires that PAC Builders perform, at its own expense, the agreed-upon scope of work (including sway bracing, pipe hangers, vertical support/riser clamps, replacement of old couplings); and
- Requires that PAC Builders install, at its own expense, a number of joint restraints.

Scope

While the facility is located within Commission District 3, which is represented by Commissioner Audrey M. Edmonson, the Adrienne Arsht Center for the Performing Arts of Miami-Dade County (Arsht Center) has countywide impact.

Fiscal impact

PAC Builders will be responsible for all construction and related costs associated with this settlement agreement. There is no monetary impact to the County with the approval of this Final Settlement Agreement.

Track record/monitor

Asael Marrero, Manager of the Design and Construction Services Division in the Internal Services Department, will monitor the work performed by PAC Builders at the Arsht Center.

Delegation of authority

This item authorizes the County Mayor or County Mayor's designee to execute the settlement agreement on behalf of the County.

Background

On October 22, 2013, the Board approved Resolution R-849-13 authorizing a Partial Settlement Agreement among Miami-Dade County, the PACT, and PAC Builders. The Partial Settlement Agreement required the following:

- PAC Builders was to proceed with the agreed-upon scope, at its own expense, which consists of additional sway bracing, pipe hangers, vertical supports/riser clamps, and the replacement of old couplings.
- The scope of work not agreed upon involving the installation of joint restraints that had previously been identified by Slider Engineering Group, Inc. (Slider), the forensic engineering firm under contract with the County, would be arbitrated by a neutral third party that must also be a licensed engineer. The estimated cost to install joint restraints at all locations identified by Slider was approximately $2,000,000.00.

Pursuant to the Partial Settlement Agreement, RPJ Inc. was jointly selected by Miami-Dade County and PAC Builders to act as the neutral Engineer/Arbitrator. RPJ Inc. issued their arbitration findings on May 9, 2014, and a follow-up clarification to their findings was issued on May 30, 2014 (Attachment 2). The arbitration findings provided by RPJ Inc. were as follows:

- Joint restraints are not required at every joint at every change of pipe direction;
- Joint restraints are required at specific locations identified and annotated on drawings. A total of 31 joint restraints were identified by RPJ, Inc. and recommended to be installed at specific locations (out of 380 previously identified locations by Slider);
- PAC Builders, under its Amended Agreement with the County for the original construction of the facility, including Change Order 73, was not required to implement the recommended scope of work for the installation of the 31 identified joint restraints.

Subsequent to the arbitration findings, the County continued to negotiate with PAC Builders and agreed upon a scope of work, which has resulted in this Final Settlement Agreement, including a total of 45 joint restraints that are acceptable to all parties. The Final Settlement Agreement shall supersede the Partial Settlement Agreement and specifies that PAC Builders will install the following items at its own expense:

Description	Ballet Opera House	Concert Hall
Sway bracing	8 braces	2 braces
Pipe hangers	4 hangers	1 hanger
Vertical support/riser clamps	1 clamp	0 clamps
Replace old couplings	1 item	7 items
Joint Restraints	25 joint restraints	20 joint restraints

It is important to note that PAC Builders has been working cooperatively with County staff since shortly after the date of the water damage to resolve this matter and the joint restraint scope of work agreed upon of 45 joint restraints, is above and beyond the 31 joint restraints recommended by the Engineer/Arbitrator. Furthermore, the Engineer/Arbitrator determined that PAC Builders was not responsible for the installation of such restraints. In spite of this favorable determination for PAC Builders, they have agreed to this settlement to perform the joint reinforcements at their cost. In consideration of this agreed upon scope of work, PAC Builders will receive a full and final release from any and all claims in response to the water damage to the facility on May 20, 2012. The total value of the work to be performed by PAC Builders pursuant to this settlement is $1,068,000.00, and will obligate PAC Builders to perform work that the Engineer/Arbitrator determined was not PAC Builder's legal

responsibility. The Engineer/Arbitrator found that PAC Builders was not responsible for the installation of any joint restraints, and this Agreement nevertheless obligates PAC Builders to perform more joint restraints than Engineer/Arbitrator recommended that the County install.

On July 17, 2012, the Board authorized the allocation of up to $5,000,000.00 for the assessment, demolition, repair, and reconstruction of the Arsht Center in response to the water damage to the facility on May 20, 2012. To date, approximately $4,500,000.00 of the funds have been expended, and $535,000 has been reimbursed to the PACT by its business interruption insurance policy with Chubb Group Insurance Companies.

As a result of the months of investigation, analysis and arbitration findings, the County may be able to pursue damages from other firms that worked on the Arsht Center. While we must further study our options and discuss any actions with the County Attorney's Office, this Final Settlement Agreement with PAC Builders would not prevent the County from taking any necessary legal actions, in regard to the other firms, to pursue recovery of costs incurred to date for the repair to the initial water damage.

PAC Builders will provide the necessary insurance and payment and performance bond documentation before work begins. PAC Builders has substantial knowledge of the Arsht Center, and will perform repairs in such a way as to minimize impacts to the balance of the facility. This is especially critical as the Arsht Center will be in operation while repair work is being performed.

This Final Settlement Agreement results in immediate performance of improvements to the structure at no cost to the County by the entity, which is most familiar with the facility. This Final Settlement Agreement avoids the risk of protracted and expensive litigation regarding the issue with PAC Builders, and hedges against a trial court concluding, similar to the Arbitrator, that PAC Builders is not responsible for damages caused by the incident. I therefore recommend approval of the Final Settlement Agreement as being in the best interest of the County.

Attachments

Michael Spring
Senior Advisor

MEMORANDUM

(Revised)

TO: Honorable Chairman Jean Monestime and Members, Board of County Commissioners

DATE: March 3, 2015

FROM: R. A. Cuevas, Jr. County Attorney

SUBJECT: Agenda Item No. 8(F)(8)

Please note any items checked.

_____	**"3-Day Rule" for committees applicable if raised**
_____	**6 weeks required between first reading and public hearing**
_____	**4 weeks notification to municipal officials required prior to public hearing**
_____	**Decreases revenues or increases expenditures without balancing budget**
_____	**Budget required**
_____	**Statement of fiscal impact required**
_____	**Ordinance creating a new board requires detailed County Mayor's report for public hearing**
✓	**No committee review**
_____	**Applicable legislation requires more than a majority vote (i.e., 2/3's ____, 3/5's ____, unanimous _____) to approve**
_____	**Current information regarding funding source, index code and available balance, and available capacity (if debt is contemplated) required**

3A

Approved _____ Mayor
Veto _____
Override _____

Agenda Item No. 8(F)(8)
3-3-15

RESOLUTION NO. R-209-15

RESOLUTION APPROVING THE FINAL SETTLEMENT AGREEMENT BY AND AMONG MIAMI-DADE COUNTY, THE PERFORMING ARTS CENTER TRUST AND PERFORMING ARTS CENTER BUILDERS JOINT VENTURE RELATED TO REPAIRS TO PERFORMANCE OF RAINWATER LEADER SYSTEM WORK AT THE ADRIENNE ARSHT CENTER; AND AUTHORIZING THE COUNTY MAYOR OR COUNTY MAYOR'S DESIGNEE EXECUTE SAME AND TO EXERCISE ANY AND ALL OTHER RIGHTS CONFERRED THEREIN

WHEREAS, this Board desires to accomplish the purposes outlined in the accompanying memorandum, a copy of which is incorporated herein by reference,

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF COUNTY COMMISSIONERS OF MIAMI-DADE COUNTY, FLORIDA, that this Board hereby approves the Final Settlement Agreement by and among Miami-Dade County, the Performing Arts Center Trust, and Performing Arts Center Builders, Joint Venture related performance of the rain water leader system work at the Adrienne Arsht Center and authorizes the County Mayor or County Mayor's Designee to execute same to and to exercise any and all other rights conferred therein.

The foregoing resolution was offered by Commissioner **Audrey Edmonson**, who moved its adoption. The motion was seconded by Commissioner **Rebeca Sosa** and upon being put to a vote, the vote was as follows:

Jean Monestime, Chairman			**aye**
Esteban L. Bovo, Jr., Vice Chairman			**absent**
Bruno A. Barreiro	**absent**	Daniella Levine Cava	**aye**
Jose "Pepe" Diaz	**aye**	Audrey M. Edmonson	**aye**
Sally A. Heyman	**aye**	Barbara J. Jordan	**absent**
Dennis C. Moss	**aye**	Rebeca Sosa	**aye**
Sen. Javier D. Souto	**aye**	Xavier L. Suarez	**aye**
Juan C. Zapata	**absent**		

The Chairperson thereupon declared the resolution duly passed and adopted this 3rd day of March, 2015. This resolution shall become effective upon the earlier of (1) 10 days after the date of its adoption unless vetoed by the County Mayor, and if vetoed, shall become effective only upon an override by this Board, or (2) approval by the County Mayor of this Resolution and the filing of this approval with the Clerk of the Board.

MIAMI-DADE COUNTY, FLORIDA
BY ITS BOARD OF
COUNTY COMMISSIONERS

HARVEY RUVIN, CLERK

By: Christopher Agrippa
Deputy Clerk

Approved by County Attorney as
to form and legal sufficiency.

David M. Murray

FINAL SETTLEMENT AGREEMENT REGARDING PERFORMANCE OF RAIN WATER LEADER SYSTEM WORK

This Final Agreement Regarding Rain Water Leader System Work (the "Agreement"), is entered into on the __ day of November, 2014, by and among Performing Arts Center Builders, J.V. ("PAC Builders"), Miami-Dade County, Florida (the "County") and the Performing Arts Center Trust (the "PACT") (and, collectively, the "Parties").

RECITALS

WHEREAS, on or about September 11, 2001, the County and PAC Builders entered into an "Amended Agreement Between Miami-Dade County and Construction Manager with a Guaranteed Maximum Price" in connection with the construction of the Performing Arts Center of Greater Miami (the "Performing Arts Center") and

WHEREAS, on or about July 23, 2004, the County and PAC Builders executed "Change Order 73 to Amended Agreement Between Miami-Dade County and Construction Manager, Project No. 9501, Dated September 11, 2001, to Provide for Services as Agency Construction Manager" (the September 11, 2011 and Change Order 73 collectively referred to herein as the "Amended Agreement"), and

WHEREAS, on May 20, 2012, flooding occurred at to the Performing Arts Center; and

WHEREAS, on or about February 7, 2013, Slider Engineering Group ("SEG") issued a report entitled "Storm Water System Failure Engineering Evaluation" (the "Report") to the County regarding alleged defects in the rain water leader ("RWL") system at the Performing Arts Center, and

WHEREAS, the parties dispute the cause of the May 20th 2012 flooding; and

WHEREAS, on or about, October 22, 2013, the County and PAC Builders entered into a Partial Settlement Agreement (a copy of which is attached hereto as Attachment A) which provided a process for determining PAC Builders responsibility to effectuate and provide various construction services to the Performing Arts Center, including the installation of various pipe hangers, riser clamps, couplings, and potentially, joint restraints; and

WHEREAS, upon full execution, this Final Agreement shall supersede the Partial Settlement Agreement",

NOW THEREFORE, in consideration of the agreements contained herein, the Parties have agreed as follows upon the terms and subject to the conditions herein contained:

TERMS AND CONDITIONS

1. The Recitals set forth above are true and accurate and incorporated herein by reference.

2. PAC Builders shall perform the Agreed Upon Scope of Work ("the Agreed Work") set forth below, in full and complete resolution of all RWL system issues, including those raised by

BMR

SEG in the Report, at the Performing Arts Center. Without waiving its rights against insurers or its subcontractors, PAC Builders shall be responsible for all costs, indirect or direct, associated with the permitting and performance of this Agreed Work, unless specifically excluded herein; with the exception that PAC Builders shall not be responsible for any costs of the PACT or the County or their consultants. PAC Builders shall coordinate the Agreed Work with the PACT and shall use reasonable efforts to minimize the impact the Agreed Work has on Performing Arts Center performances and events, which efforts may, as agreed and coordinated between the Parties, include but are not limited to multiple mobilizations or night work. The remedial drywall and other finish work shall be restored as they existed prior to the performance of the Agreed Work. The County may engage an Acoustic Engineer to review the Agreed Work and design any necessary acoustic requirements for the Agreed Work. PAC Builders shall perform, at its cost and expense, the installation of acoustic requirements for all items in the immediate vicinity of the particular element of the Agreed Work included to the extent of the acoustic requirements previously installed on similar items of work during the original construction. The Acoustic Engineer shall review the installation to ensure that the Agreed Work does not compromise the existing acoustic properties of the facility; the parties contemplate that these acoustic requirements will typically be, but are not necessarily limited to, baffling, insulation, matting, or other local means of vibration control.

Agreed Upon Scope of Work. PAC Builders shall perform the following scope of work at the Performing Arts Center, agreed upon by the Parties, and as more fully described in Attachment B hereto:

Description	Ballet Opera House	Concert Hall
Sway bracing	8 braces	2 braces
Pipe hangers	4 hangers	1 hanger
Vertical support/riser clamps	1 clamp	0 clamps
Misc.--replace old couplings	1 item	7 items
Joint Restraints	25	20

3. PAC Builders' obligation under this Agreement is solely to install, at its cost, the items described above. PAC Builders shall not be construed to be designer of the Agreed Work; notwithstanding, PAC Builders shall at its cost provide all shop drawings needed for performance of the Agreed Work which shall be reviewed and approved by the County and the acoustic engineer. PAC Builders shall allow the County, for purposes of inspection, reasonable access to the Agreed Work throughout its installation, and PAC Builders shall not close any portion of the Agreed Work until such Agreed Work has been inspected by the County. The County shall provide inspectors so as not to delay the Agreed Work. Given that the County will have these inspection opportunities, the County and the PACT will be deemed as having fully accepted (except for latent construction defects in the Agreed Work) the Agreed Work as the installation is completed with PAC Builders having no warranty obligation or obligation to correct or otherwise perform additional tasks regarding the Agreed Work.

4. PAC Builders shall execute, deliver to the County and record in the public records the necessary statutory payment and performance bonds in accordance with Section 255.05 of the Florida Statutes prior to performing any Agreed Work. PAC Builders shall procure at its cost all applicable building permits for the Agreed Work. Additionally, PAC Builders shall maintain, during the performance of the Agreed Work, insurance as specified in Attachment C.

5. The Parties waive any and all rights, actions and causes of action that they may have against each other and their partners, subcontractors, sureties and insurers and their current and former officers, directors, employees and representatives with respect to all RWL system issues, including those raised by SEG in the Report and any damages related to the May 2012 incident. The waiver in this Paragraph shall only apply to claims, rights, and causes of action related to the RWL system, with the exception of any latent defects in the performance of the Agreed Work to be performed by PAC Builders under this Agreement, and nothing herein shall be construed as a waiver of any other claims, rights, or causes of action held by the Parties pursuant to the Contract with respect to any other aspect of the Performing Arts Center or the Amended Agreement.

6. The terms of this Agreement reflect the resolution of contested and disputed claims, allegations and assertions, and the Parties have entered into this Agreement principally to avoid the time, expense and aggravation of litigation. The Parties acknowledge and agree that neither party acknowledges or admits that it was guilty of any wrongdoing of any kind. The Parties acknowledge and agree that by entering into this Agreement PAC Builders does not admit or confirm any of the claims, allegations, assertions or opinions of the County or PACT and the County does not admit or confirm any of the claims, allegations, assertions or opinions of PAC Builders.

7. This Agreement shall be governed by, construed and interpreted in accordance with, the laws of the State of Florida.

8. This Agreement may be executed in counterparts. Signatures provided by facsimile or e-mail are acceptable and binding on the Parties.

9. This Agreement shall become effective ten days after its approval by the Board of County Commissioners.

IN WITNESS WHEREOF, the Parties have executed this Agreement on the date first above written.

MIAMI-DADE COUNTY	**PERFORMING ARTS CENTER TRUST**
By: _____	By: M. J. Richard
Sign	Sign
_____	M. John Richard
Print	Print
Its: _____	Its: Pres. & C.E.O.

8

BHR

Date:_____ Date:_____

PERFORMING ARTS CENTER BUILDERS, J.V.

By: _____
Sign PETER TUAK, GENERAL COUNSEL

GILBERTO NEVES.
Print

Its: PRESIDENT & CEO.

Date: 02/10/2015

BM

Attachment A

AGREEMENT REGARDING PERFORMANCE OF RAIN WATER LEADER SYSTEM WORK

This Agreement Regarding Performance of Rain Water Leader System Work (the "Agreement"), is entered into on the 19 day of September, 2013, by and among Performing Arts Center Builders, J.V. ("PAC Builders"), Miami-Dade County, Florida (the "County") and the Performing Arts Center Trust (the "PACT") (and, collectively, the "Parties").

RECITALS

WHEREAS, on or about September 11, 2001, the County and PAC Builders entered into an "Amended Agreement Between Miami-Dade County and Construction Manager with a Guaranteed Maximum Price" in connection with the construction of the Performing Arts Center of Greater Miami (the "Performing Arts Center") and

WHEREAS, on or about July 23, 2004, the County and PAC Builders executed "Change Order 73 to Amended Agreement Between Miami-Dade County and Construction Manager, Project No. 9501, Dated September 11, 2001, to Provide for Services as Agency Construction Manager" (the September 11, 2011 and Change Order 73 collectively referred to herein as the "Amended Agreement"), and

WHEREAS, on May 20, 2012, flooding occurred at to the Performing Arts Center; and

WHEREAS, on or about February 7, 2013, Slider Engineering Group ("SEG") issued a report entitled "Storm Water System Failure Engineering Evaluation" (the "Report") to the County regarding alleged defects in the rain water leader ("RWL") system at the Performing Arts Center, and

WHEREAS, the County and PAC Builders disagree on the ultimate cause of this flooding, as PAC Builders believes that this failure was caused by a lack of redundancy in the RWL system and it is the County's position that the failure was caused by the defects outlined in the Report; and

WHEREAS, on or about April 8, 2013, the County and PAC Builders entered into a "Section 558 Letter Agreement" (a copy of which is attached hereto as Attachment A) pursuant to which PAC Builders, subject to the methodology and conditions set forth in the letter agreement, agreed to perform an agreed upon scope of work to address the findings in the Report, and

WHEREAS, following inspections of the RWL system of the Performing Arts Center performed pursuant to the Section 558 Letter Agreement, the Parties developed an agreed upon scope of work for sway bracing, pipe hangers, vertical support/riser clamps, and the replacement of old couplings (the "Agreed Scope of Work"). The Parties, however, were unable to develop an agreed upon scope of work for joint restraints (the "Joint Restraint Scope of Work") at the Performing Arts Center, and

WHEREAS, the Parties have agreed upon a procedure for resolving the Joint Restraint Scope of Work, and

WHEREAS, upon full execution, this Agreement shall supersede the April 8, 2013 "Section 558 Letter Agreement", and

DHR

WHEREAS, the Amended Agreement, including Change Order 73, remains in full force and effect, and

WHEREAS, PAC Builders was not and is not the designer of the Performing Arts Center project and is not the designer of any of the work required to be performed under a decision of the independent third party engineer/arbitrator as described below, and

WHEREAS, the County is designing and constructing a code compliant redundant system for removing water from the overflow system devices on the roofs of the Performing Arts Center., and

NOW THEREFORE, in consideration of the agreements contained herein, the Parties have agreed as follows upon the terms and subject to the conditions herein contained:

TERMS AND CONDITIONS

1. The Recitals set forth above are true and accurate and incorporated herein by reference.

2. Subject to paragraph 6 below, PAC Builders shall perform the Agreed Upon Scope of Work set forth in Paragraph 2(A), below, and the Joint Restraint Scope of Work set forth in Paragraph 2(B) (collectively, "the Work"), below, in full and complete resolution of the RWL system issues, including those raised by SEG in the Report. Without waiving its rights against insurers or its subcontractors, PAC Builders shall be responsible for all costs, indirect or direct, associated with the permitting and performance of this Work, unless specifically excluded herein; with the exception that PAC Builders shall not be responsible for any costs of the PACT or the County or their consultants. PAC Builders shall coordinate the Work with the PACT and shall use reasonable efforts to minimize the impact the Work has on Performing Arts Center performances and events, which efforts may, as agreed and coordinated between the Parties, include but are not limited to multiple mobilizations or night work. The remedial drywall and other finish work shall be restored as they existed prior to the performance of the Work. The County shall engage an Acoustic Engineer to review the Work and design any necessary acoustic requirements for the Work included in Paragraph 2(A) and 2(B). PAC Builders shall perform, at its cost and expense, the installation of acoustic requirements for all items in the immediate vicinity of the particular element of the Work included to the extent of the acoustic requirements previously installed on similar items of work during the original construction. The Acoustic Engineer shall review the installation to ensure that the Work does not compromise the existing acoustic properties of the facility; the parties contemplate that these acoustic requirements will typically be, but are not necessarily limited to, baffling, insulation, matting, or other local means of vibration control.

(A) Agreed Upon Scope of Work. PAC Builders shall perform the following scope of work at the Performing Arts Center, agreed upon by the Parties, and as more fully described in Attachment B hereto:

Description	Ballet Opera House	Concert Hall
Sway bracing	8 braces	2 braces
Pipe hangers	4 hangers	1 hanger

Vertical support/riser clamps	1 clamp	0 clamps
Misc.--replace old couplings	1 item	7 items

(B) Joint Restraint Scope of Work. The scope of work pertaining to joint restraints shall be resolved on a binding basis by Jorge Reyes, P.E., TLC Engineering, 5757 Blue Lagoon Drive, Suite 400, Miami, Florida 33126, or Rafael Pena, Jr., P.E., RPJ Inc., 4977 SW 74th Ct., Miami, Florida 33155, or such other independent third-party engineer/arbitrator as may be agreed upon by the Parties, the costs of which shall be shared equally by the County and PAC Builders. The Parties shall mutually agree upon a not-to-exceed cost for such engineer/arbitrator prior to his hiring. The aspects of this Agreement relating to the independent third-party engineer/arbitrator are considered an agreement to arbitrate as provided in the Florida Arbitration Code and the arbitration process shall be conducted as follows:

(i) The independent third-party engineer/arbitrator's assessment shall be based on a review of the RWL system at the Performing Arts Center, the design drawings and specifications (including specified manufacturers' requirements), codes, and industry standards-of-care applicable to the Amended Agreement;

(ii) The February 7, 2013 SEG Report shall be the County's expert report. PAC Builders shall provide its experts report(s) no later than 10 days before the hearing commences. The County and PAC Builders shall: (a) submit their positions in writing at least 5 days before the hearing commences; and (b) make a presentation to the independent third-party engineer/arbitrator, with experts being sworn under oath and subject to cross-examination. The engineer/arbitrator may allow oral or written rebuttal, at his discretion. The presentation for each party shall not exceed four hours. Prior to any presentations, the engineer/arbitrator shall conduct a field inspection, in the presence of representatives of the Parties. The engineer/arbitrator shall issue his report with ten days of the close of presentations, unless otherwise agreed to by the Parties.

(iii) The independent third-party engineer/arbitrator shall consider whether (A) joint restraints are required at every joint at every change of pipe direction or, if restraints are not required at every joint, if (B) joint restraints are required at specific locations based on an engineering evaluation on a case-by-case basis. In the event that the engineer/arbitrator determines that all or some joints at the PAC are required to be restrained, the engineer/arbitrator shall identify the appropriate restraints for such joints; and

(iv) The decision from the independent third-party engineer/arbitrator on the Joint Restraint Scope of Work shall be as follows:

Based on a review of the RWL system at the Performing Arts Center of Greater Miami, the design drawings and specifications, applicable codes and industry standards-of-care, the implementation of my developed attached scope of work (joint restraints only) was required by PAC Builders under its Amended Agreement, including Change Order 73, with the County.

The engineer/arbitrator shall not base his decision on a statutes of limitations defense. PAC Builders will not raise as a defense in this engineer/arbitrator process only that the approval of its previous shop drawings or other submittals for what is currently installed is decisive on the ultimate issue as set for the above; however, PAC Builders shall be permitted to argue that the approval of its shop drawings and other submittals reflected a certain interpretation of the existing design drawings and specifications, applicable codes and industry standards-of-care.

(v) The independent third-party engineer/arbitrator shall have no liability to the Parties to this Agreement

3. The hearing shall be held in Miami, Florida.

4. PAC Builders obligation under this Agreement is solely to install, at its cost, the items described in Paragraph 2(A), above, and pursuant to the findings of the independent engineer/arbitrator, the joint restraints under Paragraph 2(B), above (referred to collectively as "the Work"). PAC Builders shall not be construed to be designer of the Work; notwithstanding, PAC Builders shall at its cost provide all shop drawings needed for performance of the Work which shall be reviewed and approved by the County and the acoustic engineer. PAC Builders shall allow the County, for purposes of inspection, reasonable access to the Work throughout its installation, and PAC Builders shall not close any portion of the Work until such Work has been inspected by the County. The County shall provide inspectors so as not to delay the Work. Given that the County will have these inspection opportunities, the County and the PACT will be deemed as having fully accepted (except for latent construction defects) the Work as the installation is completed with PAC Builders having no warranty obligation or obligation to correct or otherwise perform additional tasks regarding the Work.

5. The decision of the independent third-party engineer/arbitrator relating to the Joint Restraint Scope of Work shall be final and binding, and judgment may be entered upon it in accordance with the Florida Arbitration Code.

6. PAC Builders shall execute, deliver to the County and record in the public records the necessary statutory payment and performance bonds in accordance with Section 255.05 of the Florida Statutes prior to performing any work. PAC Builders shall procure at its cost all applicable building permits for the Work. Additionally, PAC Builders shall maintain, during the performance of the Work, insurance as specified n Attachment C.

7. The Parties do not waive and expressly reserve any claims, rights and/or defenses they may have in connection with the costs and expenses incurred prior to the date of this Agreement by the County or PACT in connection with the alleged RWL system defects, including

the costs of containing and repairing the damage caused to the Performing Arts Center by the flooding that occurred on May 20, 2012, and including their respective theories of causation of the May 20, 2012 incident as reflected in the fifth WHEREAS. Although in consideration of this Agreement and its performance, the Parties waive any and all rights, actions and causes of action that they may have against each other and their partners, subcontractors, sureties and insurers and their current and former officers, directors, employees and representatives with respect to the defects to the RWL system that the Work to be performed by PAC Builders is intended to correct, including those raised by SEG in the Report, the Parties do not waive any claims, rights and/or defenses they may have in connection with the costs and expenses incurred prior to the date hereof by the County or PACT in connection with the alleged defects. Neither the execution of this Agreement nor the work to be performed under this Agreement shall be used by any of the Parties, including the PACT, to claim or otherwise assert that any statute of limitation defense of any Party has not run or expired. The waiver in this Paragraph shall only apply to claims, rights, and causes of action related to the RWL system, and nothing herein shall be construed as a waiver of any other claims, rights, or causes of action held by the Parties pursuant to the Contract with respect to any other aspect of the Performing Arts Center or the Amended Agreement.

8. The terms of this Agreement reflect the resolution of contested and disputed claims, allegations and assertions, and the Parties have entered into this Agreement principally to avoid the time, expense and aggravation of litigation. The Parties acknowledge and agree that neither party acknowledges or admits that it was guilty of any wrongdoing of any kind. The Parties acknowledge and agree that by entering into this Agreement or by agreeing to be bound to the decision of the independent third-party engineer/arbitrator, PAC Builders does not admit or confirm any of the claims, allegations, assertions or opinions of the County or PACT and the County does not admit or confirm any of the claims, allegations, assertions or opinions of PAC Builders. The Parties agree that they will not offer or tender this Agreement, any record of the negotiations leading up to this Agreement, the County Mayor's memorandum to the Board of County Commissioners concerning this Agreement, the Board of County Commissioner's deliberation of this Agreement, or the decision of the independent third-party engineer/arbitrator into evidence in any proceeding between or among them or their insurers, including a proceeding by the County or PACT, or an insurer of the County or PACT, regarding the costs and expenses already incurred by the County or PACT in connection with the alleged defects. Notwithstanding the preceding, PAC Builders expressly acknowledges that this Agreement and the decision of the engineer/arbitrator are public records as defined in Florida Statutes, and the County may, without liability and upon request for such public records, provide such documents to third parties. The limitation on the offering of this Agreement or the decision of the arbitrator into evidence does not apply to the Report.

9. The Parties further agree that this Agreement, the negotiations leading to the execution of this agreement, the County Mayor's memorandum to the Board of County Commissioners concerning this Agreement, the Board of County Commissioner's deliberation of this Agreement and the decision of the independent third-party engineer/arbitrator shall remain non-admissible and non-discoverable, as if they were part of a mediation process, in any proceeding of any kind, including a proceeding by the County or PACT or an insurer of the County or PACT (regardless of whether such proceeding involves other entities), except a proceeding between the Parties hereto for breach of this Agreement or except in a proceeding by PAC Builders against its subcontractors, or in any action to enforce the terms of this Agreement.

10. This Agreement shall be governed by, construed and interpreted in accordance with, the laws of the State of Florida.

11. This Agreement may be executed in counterparts. Signatures provided by facsimile or e-mail are acceptable and binding on the Parties.

12. This Agreement shall become effective ten days after its approval by the Board of County Commissioners.

IN WITNESS WHEREOF, the Parties have executed this Agreement on the date first above written.

MIAMI-DADE COUNTY

By: _____
Sign

_____
Print

Its: _____

Date: _____

PERFORMING ARTS CENTER TRUST

By: _____
Sign

_____
Print

Its: _____

Date: _____

PERFORMING ARTS CENTER BUILDERS, J.V.

By: Brad H Rinzler for Luiz Simon
Sign

Brad H Rinzler for Luiz Simon
Print

Its: Project Executive

Date: 19 Sep 13

COUNTY ATTORNEY
MIAMI-DADE COUNTY, FLORIDA

Attachment A

111 N.W. 1 ST., SUITE 2810
MIAMI, FLORIDA 33128-1993
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April 8, 2013

James E. Moye, Esq.
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800 South Orlando Avenue
Maitland, Florida 32751

Section 558[1] Letter Agreement

Re: Adrienne Arsht Center for the Performing Arts of Miami-Dade County ("Arsht Center")

The following proposal is made by the County to PAC Builders to address the findings of the Slider Engineering Report titled Storm Water System Failure Engineering Evaluation dated February 7, 2013 (the "Report") at the Arsht Center.

1. Subject to the methodology and conditions described below, PAC Builders agrees to perform the agreed upon scope of work (the "Scope of Work") to address the findings of the Report and using the Report as a guideline.

(a) Inspections. The Scope of Work shall be developed in the following manner and in coordination with the Performing Arts Center Trust (the "PACT") in order to minimize the impact to the operations of the Arsht Center: (1) the Parties will identify the specific locations of the storm drain piping; (2) the Parties will determine the means of access to the storm water piping system; (3) the Parties will jointly inspect the storm water piping; (4) following the inspections, PAC Builders will restore the areas to a finished condition acceptable to the PACT and the County; and (5) PAC Builders will be solely responsible for all costs associated with identifying such access, establishing access and restoring the areas to a finished condition acceptable to the PACT and the County, including the costs of any necessary destructive testing; with the exception of any costs of PACT or the County or their consultants.

(b) Scope of Work. Within 20 days after completion of the Inspections, the County shall deliver to PAC Builders a Scope of Work plan, including a proposed schedule and phasing plan to accomplish the work with minimum impact to the facility. PAC Builders shall approve, reject or approve in part the Scope of Work plan. In the event the Parties agree upon a Scope of Work plan, PAC Builders shall perform all of the work described in the Scope of Work plan (the "Work") in accordance with the agreed upon schedule and plan. In the event such an agreement is reached, PAC Builders shall be responsible for all costs, indirect or direct, associated

[1] This Agreement is not an admission that Section 558 is applicable to this Project.

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with the performance of the Work; with the exception of any costs of PACT or the County or their consultants. PAC Builders shall not perform any of the Work without a prior written agreement of the Parties. Notwithstanding any other provision of this Agreement, in the event the Parties do not agree upon a written Scope of Work plan within 60 days from the date of this letter, the County may perform the Work and any other necessary repairs to the Arsht Center through other means with both Parties fully reserving their rights against each other, including with respect to any disagreements with the Scope of Work.

(c) PAC Builders shall coordinate the Work with the Performing Arts Center Trust and shall use best efforts to minimize the impact the Work has on Arsht Center performances and events.

(d) PAC Builders shall execute, deliver to the County and record in the public records the necessary statutory payment and performance bonds in accordance with Section 255.05 of the Florida Statutes prior to performing any work.

2. The Parties do not waive any rights and/or defenses they may have in connection with the costs and expenses already incurred by the County in connection with these alleged defects. The County further reserves any rights to recover the incremental costs to the County from the continued engagement of its Consulting Engineers, the costs of its staff engaged in the activities set forth in this plan, and other reasonable third party costs incurred to address the Work.

3. The Parties agree that any statutory, contractual, equitable or other deadlines that the Parties may have to bring a lawsuit or a claim against each other in connection with the storm water drainage system at the Arsht Center and any damages and costs associated with this system shall be tolled until completion of the Work.

4. Any final resolution of this matter that conclusively allocates costs or liability or that waives any rights or defenses may be subject to Board of County Commissioners approval.

5. The Parties agree that that this settlement offer is made in privilege, and nothing contained herein shall be deemed admissible in any court or proceeding, including any Florida state or federal court.

Sincerely,

Danny Frastai
Assistant County Attorney

I confirm my agreement and acceptance to the terms listed in this letter,

For and on behalf of Miami-Dade County

LISA MARTINEZ

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Date 4/10/13

For and on behalf of PAC Builders

LUIZ SIMON

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Date 4/8/2013

cc: Lester Sola, Director
Miami-Dade County
Internal Services Dept.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
31	Pipe	3"	1	B-P2.18	Intermediate	West MER	None	**None**	1				Brace 3" vent piping which appeared not to be sufficiently braced.
8	Pipe Sway Brace	4"	1	B-P2.07	Box Tier	Donor's Lounge	**None**	None	1				4" pipe appeared not to be solid or well braced - will add sway brace.
34.2	90 Elbow	3"	3	B-P2.19	Fourth Tier	Main Lobby	None	None	**None**			3	Pipe appeared to be solid and well supported. These 90 elbows pick-up RD above with short vertical drop from RD - no JR needed.
5	90 Elbow	6"	2	B-P2.04	Orchestra	Main Lobby	None	**None**	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
5.1	45 Elbow	6"	1	B-P2.04	Orchestra	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Horizontal 45 elbow has no load, no thrust and no JR needed.
7	90 Elbow	6"	4	B-P2.07	Box Tier	Restaurant	**None**	None	None			4	Using access panels, confirmed that pipe was solid and well braced. Pipe run is above Venetian Plaster Ceiling. Pipe fittings are not at the base of a riser and not subjected to thrust loads - no JR needed.
7.1	45 Elbow	6"	1	B-P2.07	Box Tier	Restaurant	None	None	None			1	Pipe found to be solid and well braced. Vertical (turned down) 45 elbow has no load, no thrust and no JR needed.
7.3	Wye	6"	1	B-P2.07	Box Tier	Restaurant	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal and has no load, no thrust and no JR needed.
8.1	90 Elbow	6"	4	B-P2.07	Box Tier	Donor's Lounge	None	None	**None**			4	Pipe found to be solid and well braced. Elbow picks-up RD above. Primarily horizontal pipe, not a base 90 under tall riser. Has short vertical drop, no thrust load, no JR needed.
8.2	45 Elbow	6"	2	B-P2.07	Box Tier	Donor's Lounge	None	None	None			2	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
8.4	Wye	6"	2	B-P2.07	Box Tier	Donor's Lounge	None	**None**	None			2	Pipe found to be solid and well braced. Wye is horizontal pipe with no thrust load, no JR needed.
9.1	90 Elbow	6"	1	B-P2.07	Box Tier	Chorus Restroom	**None**	None	None		1		Pipe found to be solid and well braced. However, 90 elbow is at the bottom of a riser - JR to be specified.
9.2	45 Elbow	6"	1	B-P2.07	Box Tier	Chorus Restroom	None	None	None			1	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
9.3	Wye	6"	1	B-P2.07	Box Tier	Chorus Restroom	**None**	None	None			1	Pipe found to be solid and well braced. Wye is horizontal pipe with no thrust load, no JR needed.
10	90 Elbow	6"	3	B-P2.08	Box Tier	Chorus & Perf Lounge	None	**None**	None			3	Pipe found to be solid and well braced. One elbow picks-up RD above, not a base 90 under tall riser. Has short vertical drop from RD. Second 90 is horizontal and third 90 is at top of riser (turned down). These are not subjected to thrust loads, no JR needed.

Attachment B

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
10.1	45 Elbow	6"	2	B-P2.08	Box Tier	Chorus & Perf Lounge	None	None	None			2	Pipe found to be solid and well braced. 45 elbow is vertical turned down fitting with no thrust load, no JR needed.
11.2	90 Elbow	6"	1	B-P2.08	Box Tier	Chorus & Toilet	None	None	None			1	Pipe found to be solid and well braced. This 90 elbow picks-up RD above with short vertical drop from RD. Not subjected to thrust loads, no JR needed.
12	90 Elbow	6"	1	B-P2.08	Box Tier	Children's	None	None	None			1	Pipe found to be solid and well braced. 90 elbow picks-up RD above, not a base 90 under tall riser. Has short vertical drop from RD and not subjected to thrust loads, no JR needed.
13.1	90 Elbow	6"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. 90 elbow picks-up small RD above with short vertical drop from RD and not subjected to thrust loads, no JR needed.
14	90 Elbow	6"	2	B-P2.09	Box Tier	Mechanical Room	None	None	None			2	Pipe found to be solid and well braced. One elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is at the top of riser (turned down). These are not subjected to thrust loads, no JR needed.
14.1	45 Elbow	6"	2	B-P2.09	Box Tier	Mechanical Room	None	None	None			2	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
17	90 Elbow	6"	3	B-P2.09	Box Tier	Studio Storage	None	None	None			3	Pipe found to be solid and well braced. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Other 90s are at the top of riser (turned down). These are not subjected to thrust loads, no JR needed.
17.1	45 Elbow	6"	11	B-P2.09	Box Tier	Studio Storage	None	None	None			11	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
17.3	Wye	6"	1	B-P2.09	Box Tier	Studio Storage	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
18	90 Elbow	6"	3	B-P2.12	Second Tier	West MER	None	None	None			3	Pipe found to be solid and well braced. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is at the top of riser (turned down). Third 90 is horizontal with no thrust load. These are not subjected to thrust loads, no JR needed.
19.2	90 Elbow	6"	3	B-P2.14	Second Tier	Chiller Plant	None	None	None			3	Pipe found to be solid and well braced. 90 elbows pick-up RD above with short vertical drop from RD - no JR needed.
19.3	45 Elbow	6"	2	B-P2.14	Second Tier	Chiller Plant	None	None	None			2	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
19.5	Wye	6"	1	B-P2.14	Second Tier	Chiller Plant	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
22.1	90 Elbow	6"	1	B-P2.15	Third Tier	West MER	None	None	None		1		Piping found solid and well braced. 90 elbow is a base 90 at bottom of riser and should have JR specified

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
22.2	45 Elbow	6"	3	B-P2.15	Third Tier	West MER	None	None	None			3	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
22.4	Wye	6"	1	B-P2.15	Third Tier	West MER	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
23	90 Elbow	6"	1	B-P2.16	Third Tier	Ken's Office	None	None	None			1	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.
23.1	Wye	6"	1	B-P2.16	Third Tier	Ken's Office	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
24.2	90 Elbow	6"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None		1		Piping appeared to be solid and well braced. 90 elbow is a base 90 at bottom of riser and should have JR specified.
24.6	Wye	6"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
25.4	90 Elbow	6"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None			2	Pipe found to be solid and well braced. 90 elbows pick-up RD above with short vertical drop from RD. No thrust loads - no JR needed.
25.8	Wye	6"	1	B-P2.16	Third Tier	Mech Duct Space	None	None	None			1	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
26	90 Elbow	6"	2	B-P2.17	Intermediate	East MER	None	None	None			2	Pipe found to be solid and well braced and tight to the slab. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is horizontal with no thrust load. These are not subjected to thrust loads, no JR needed.
29	45 Elbow	6"	2	B-P2.17	Intermediate	West MER	None	None	None			2	Pipe found to be solid and well braced. 45 elbows are vertical with no thrust load, no JR needed.
30	90 Elbow	6"	2	B-P2.18	Intermediate	West MER	None	None	None			2	Pipe found to be solid and well braced. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is horizontal with no thrust load. These are not subjected to thrust loads, no JR needed.
30.1	45 Elbow	6"	3	B-P2.18	Intermediate	West MER	None	None	None			3	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
32	90 Elbow	6"	2	B-P2.18	Intermediate	North MER	None	None	None			2	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and second 90 elbow is horizontal - not subjected to thrust loads - no JR.
32.1	Wye	6"	2	B-P2.18	Intermediate	North MER	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
33.1	90 Elbow	6"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Pipe found to be solid and well braced tight to structure. 90 elbow picks-up RD above with short vertical drop from RD - no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
36.3	90 Elbow	6"	4	B-P2.21	Attic	Lower Attic	None	None	None			4	Pipe found to be well supported and braced. These 90 elbows pick-up RD/trench above with short vertical drop from RD - no JR needed.
37.3	90 Elbow	6"	1	B-P2.22	Attic	North Attic Above IT Area	None	None	None			1	Pipe found to be well supported and braced tight to structure. These 90 elbows are horizontal and not subjected to thrust loads - no JR needed.
37.9	Wye	6"	3	B-P2.22	Attic	North Attic Above IT Area	None	None	None			3	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
38.4	90 Elbow	6"	2	B-P2.24	Attic	Upper Attic	None	None	None			2	Pipe found to be well supported and braced. These 90 elbows pick-up RD above with short vertical drop from RD - no JR needed.
38.6	45 Elbow	6"	3	B-P2.24	Attic	Upper Attic	None	None	None			3	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
38.8	Wye	6"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
4	90 Elbow	8"	2	B-P2.04	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
4.1	45 Elbow	8"	1	B-P2.04	Orchestra	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Horizontal 45 elbow has no load, no thrust and no JR needed.
4.2	Wye	8"	1	B-P2.04	Orchestra	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Horizontal wye has no load, no thrust and no JR needed.
9	90 Elbow	8"	1	B-P2.07	Box Tier	Chorus Restroom	None	None	None			1	Pipe found to be solid and well braced. 90 elbow is vertical (turned down) fitting with no thrust load, no JR needed.
13.4	Wye	8"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
15	90 Elbow	8"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None		1		Piping found solid and well braced. 90 elbow is a base 90 at bottom of riser and should have JR specified.
15.1	45 Elbow	8"	3	B-P2.09	Box Tier	Mechanical Room	None	None	None			3	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
16	90 Elbow	8"	3	B-P2.09	Box Tier	Studio Theater	None	None	None			3	Pipe found to be solid and well braced to the CMU wall. Not base 90s subjected to thrust loads - no JR needed.
16.1	45 Elbow	8"	1	B-P2.09	Box Tier	Studio Theater	None	None	None			1	Pipe found to be solid and well braced to the CMU wall. Not base fitting subjected to thrust loads - no JR needed.

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
17.2	Wye	8"	1	B-P2.09	Box Tier	Studio Storage	None	None	None			1	Pipe found to be solid and well braced. This wye is a vertical (turned down) fitting with no thrust load, no JR needed.
19	Pipe	8"	1	B-P2.14	Second Tier	Chiller Plant	None	1	None				Adjust Riser Clamp to slab.
19.1	90 Elbow	8"	2	B-P2.14	Second Tier	Chiller Plant	None	None	None			2	Pipe found to be solid and well braced. One 90 elbow is at the top of riser (turned down). Second is a fitting on a well supported horizontal run. These are not subjected to thrust loads, no JR needed.
19.4	Wye	8"	1	B-P2.14	Second Tier	Chiller Plant	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
20	90 Elbow	8"	4	B-P2.14	Second Tier	East Storage	None	None	None			4	This is an OFD that spills on a lower roof. 90 elbows pick-up RD above with short vertical drop from RD and spills onto a lower roof. These are well supported and braced and are not subjected to thrust loads, no JR needed.
22	90 Elbow	8"	1	B-P2.15	Third Tier	West MER	None	None	None			1	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.
22.3	Wye	8"	1	B-P2.15	Third Tier	West MER	None	None	None		1		Piping found solid and well braced. Wye is a 8" diameter wye at the end of a pipe run which may be subjected to thrust load - should have JR specified.
24.1	90 Elbow	8"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Piping found solid and well braced. 90 elbow is horizontal and not subjected to thrust loads - no JR.
24.5	Wye	8"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
25.3	90 Elbow	8"	3	B-P2.16	Third Tier	Mech Duct Space	None	None	None		3		Piping appeared to be solid and well braced. 90 elbows are base 90s at the bottom of risers and should have JRs specified.
25.5	45 Elbow	8"	1	B-P2.16	Third Tier	Mech Duct Space	None	None	None			1	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
25.7	Wye	8"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
30.2	Wye	8"	1	B-P2.18	Intermediate	West MER	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
31.1	Pipe	8"	1	B-P2.18	Intermediate	West MER	None	None	1				Pipe found not sufficiently braced. Install a brace on OFD to column
33	90 Elbow	8"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Piping found solid and well braced tight to structure. 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
33.2	45 Elbow	8"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Pipe found to be solid and well braced tight to structure. 45 elbow is horizontal pipe with no thrust load, no JR needed.

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
33.3	Wye	8"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Pipe found to be solid and well braced tight to structure. Wye is horizontal pipe with no thrust load, no JR needed.
34.1	90 Elbow	8"	2	B-P2.19	Fourth Tier	Main Lobby	None	None	None			2	Pipe appeared to be solid and well supported. Both 90 degree elbows are horizontal and are not subjected to thrust loads - no JR.
34.4	45 Elbow	8"	3	B-P2.19	Fourth Tier	Main Lobby	None	None	None			3	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
34.6	Wye	8"	4	B-P2.19	Fourth Tier	Main Lobby	None	None	None			4	Pipe appeared to be solid and well supported tight to structure. Wyes are horizontal to pick up roof drains and are not subjected to thrust loads - no JR.
35	90 Elbow	8"	3	B-P2.20	Fourth Tier	Above Dimmer & IT East	None	None	None			3	Piping found solid and well braced. Two 90 elbows are horizontal and subjected to no thrust loads - no JR. One 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
35.1	45 Elbow	8"	2	B-P2.20	Fourth Tier	Above Dimmer & IT East	None	None	None			2	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
35.2	Wye	8"	1	B-P2.20	Fourth Tier	Above Dimmer & IT East	None	None	None			1	Pipe appeared to be solid and well supported. Wye is horizontal and are not subjected to thrust loads - no JR.
36.2	90 Elbow	8"	4	B-P2.21	Attic	Lower Attic	None	None	None			4	Pipe found to be well supported and braced. These 90 elbows are horizontal and not subjected to thrust loads - no JR.
36.5	45 Elbow	8"	2	B-P2.21	Attic	Lower Attic	None	None	None			2	Pipe found to be well supported and braced. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
36.7	Wye	8"	1	B-P2.21	Attic	Lower Attic	None	None	None			1	Pipe found to be well supported and braced. Wye is horizontal and not subjected to thrust loads - no JR needed.
37.5	45 Elbow	8"	5	B-P2.22	Attic	North Attic Above IT Area	None	None	None			5	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
37.8	Wye	8"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None			2	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
38.1	Pipe	8"	1	B-P2.24	Attic	Upper Attic	1	None	None				Provide hanger at 8" wye for added support.
38.3	90 Elbow	8"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be well supported and braced tight to structure. 90 elbow is horizontal and not subjected to thrust loads - no JR needed.
38.5	45 Elbow	8"	3	B-P2.24	Attic	Upper Attic	None	None	None			3	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
38.7	Wye	8"	4	B-P2.24	Attic	Upper Attic	None	None	None			4	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
1	90 Elbow	10"	2	B-P2.03	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
3	90 Elbow	10"	2	B-P2.03	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
3.1	45 Elbow	10"	2	B-P2.03	Orchestra	Main Lobby	None	None	None			2	Pipe found to be solid and well braced. Horizontal 45 elbow has no load, no thrust and no JR needed.
6	90 Elbow	10"	3	B-P2 05	Orchestra	Loading Dock	None	None	None			3	Was able to confirm a portion of the pipe was solid and well braced. A portion was above loading dock stucco ceiling and could not be seen. The entire pipe run is primarily horizontal and not subjected to thrust loads with no JR needed. Could access elbow near column line HK by cutting in a new AP if needed.
6.1	Wye	10"	1	B-P2.05	Orchestra	Loading Dock	None	None	None			1	Was able to confirm the pipe was solid and well braced. The pipe run is primarily horizontal and not subjected to thrust loads with no JR needed.
8.3	Wye	10"	1	B-P2.07	Box Tier	Donor's Lounge	None	None	None			1	Pipe found to be solid and well braced. Wye fitting is vertical (turned-down) no thrust load, no JR needed.
13	90 Elbow	10"	2	B-P2.09	Box Tier	Mechanical Room	None	None	None		1	1	Piping found solid and well braced. One 90 elbow is a base 90 at bottom of riser and should have JR specified. Second base 90 elbow is top of riser (turned down) and not subjected to thrust load - no JR needed.
13.2	45 Elbow	10"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
13.3	Wye	10"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
24	90 Elbow	10"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.
24.3	45 Elbow	10"	3	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			3	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
24.4	Wye	10"	2	B-P2 16	Third Tier	Chiller Plant & CEO	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
34	90 Elbow	10"	2	B-P2.19	Fourth Tier	Main Lobby	None	None	None			2	Pipe appeared to be solid and well braced tight to concrete shear wall. Both 90 degree elbows are horizontal and are not subjected to thrust loads - no JR.
34.3	45 Elbow	10"	4	B-P2.19	Fourth Tier	Main Lobby	None	None	None			4	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
34.5	45 Elbow	10"	4	B-P2.19	Fourth Tier	Main Lobby	None	None	None			4	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
34.6	Wye	10"	6	B-P2.19	Fourth Tier	Main Lobby	None	None	None			6	Pipe appeared to be solid and well supported. Wyes are horizontal and are not subjected to thrust loads - no JR.
37	Pipe	10"	1	B-P2 22	Attic	North Attic Above IT Area	None	None	1				Pipe found not to be sufficiently braced. Pipe to be braced to beams/columns.
37.2	90 Elbow	10"	3	B-P2.22	Attic	North Attic Above IT Area	None	None	None		3		Piping appeared to be solid and well braced. 90 elbows are base 90s at the bottom of tall risers and should have JRs specified.
37.4	45 Elbow	10"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None			2	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
37.7	Wye	10"	1	B-P2.22	Attic	North Attic Above IT Area	None	None	None			1	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
38	Pipe	10"	1	B-P2.24	Attic	Upper Attic	None	None	1				Need sway brace to structure to brace pipe.
38.2	90 Elbow	10"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be solid and well braced. 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
38.7	Wye	10"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
2	90 Elbow	12"	2	B-P2.03	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
7.2	Wye	12"	1	B-P2.07	Box Tier	Restaurant	None	None	None			1	Pipe found to be solid and well braced. Vertical (turned down) wye has no load, no thrust and no JR needed.
21	Pipe	12"	1	B-P2.15	Third Tier	East MER	1	None	None				Support for 12" wye fitting with unistrut
21.1	90 Elbow	12"	2	B-P2.15	Third Tier	East MER	None	None	None		1	1	Piping found solid and well braced. First 90 elbow is a base 90 at bottom of riser and should have JR specified. Second 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
21.2	Wye	12"	2	B-P2.15	Third Tier	East MER	None	None	None		1	1	Piping found solid and well braced. First wye is a large diameter 12" to 12" wye at the end of a pipe run which may be subjected to thrust load - should have JR specified. Second wye is a horizontal 6" to 12" wye not subjected to thrust loads - no JR.
25	Pipe	12"	1	B-P2.16	Third Tier	Mech Duct Space	1	None	None				Piping was supported by temporary scaffolding. Agreed to provide additional support under 12" wye.
25.1	NH Coupling	12"	1	B-P2.16	Third Tier	Mech Duct Space	None	None	None	1			Replace existing NH Coupling
25.2	90 Elbow	12"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None		1	1	Piping found solid and well braced. One 90 elbow already has JR, but must replace the coupling. Second 90 elbow is at the top of a riser (turned down) and not subjected to thrust load - no JR needed.
25.6	Wye	12"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
27	90 Elbow	12"		B-P2.17	Intermediate	East Public Restroom	None	None	None				This line was repaired prior to closing GWB ceilings.
28	90 Elbow	12"		B-P2.17	Intermediate	Elev #8 Lobby	None	None	None				This line does not show offset in as-built. Was a straight vertical pipe in the field. No JR needed.
36	Pipe	12"	3	B-P2.21	Attic	Lower Attic	None	None	3				Pipe to be braced to trusses.
36.1	90 Elbow	12"	2	B-P2.21	Attic	Lower Attic	None	None	None			2	One 90 elbow is horizontal and not subjected to thrust loads - no JR. One 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
36.4	45 Elbow	12"	3	B-P2.21	Attic	Lower Attic	None	None	None			3	Pipe found to be well supported and braced. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
36.6	Wye	12"	1	B-P2.21	Attic	Lower Attic	None	None	None			1	Pipe found to be well supported and braced. Wye is horizontal and not subjected to thrust loads - no JR needed.
37.1	90 Elbow	12"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None		2		Piping appeared to be solid and well braced. 90 elbows are base 90s at the bottom of tall risers and should have JRs specified.
37.6	Wye	12"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None		2		Piping appeared to be solid and well braced. Wyes are at the end of long pipe runs and may be subjected to thrust loads. Should have JRs specified.
11	Pipe	15"	1	B-P2.08	Box Tier	Toilet	1	None	None				Pipe not found to be well braced. Will provide bridging hanger above restroom.
11.1	90 Elbow	15"	3	B-P2.08	Box Tier	Chorus & Toilet	None	None	None		1	2	Piping found solid and well braced. One 90 elbow above toilet room should have JR specified. Second base 90 elbow is fixed within CMU shaft wall - no JR needed. Third 90 elbow is top of riser (turned down) without thrust load - no JR needed.
11.3	45 Elbow	15"	2	B-P2.08	Box Tier	Chorus & Toilet	None	None	None			2	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
11.4	Wye	15"	1	B-P2.08	Box Tier	Chorus & Toilet	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
	TOTALS		258				4	1	8	1	25	219	

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
1	Additional bracket	4"	1	C-P2.01	Orchestra	Orch Lobby above elect rm	1	None	None				
14.2	Pipe	4"	1	C-P2.06	Box Tier	Women Dressing	None	None	1				4" pipe may need to be braced. Will confirm and install if needed.
2	90 Elbow	6"	2	C-P2.02	Orchestra	Conductors Office	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow should have JR specified. 2nd 90 is at the top of a riser and not subjected to thrust loads.
4	90 Elbow	6"	3	C-P2.02	Orchestra	Soloist Dressing	None	None	None		1	2	Pipe found to be solid and well braced. Base 90 JR difficult but can be done. Other horizontal 90s above ductwork have no thrust loads and no JR needed.
6	22.5 Elbow	6"	2	C-P2.03	Orchestra	Laundry Room	None	None	None			2	Pipe found to be solid and well braced. These are offset fittings on vertical riser. No thrust. Need to relocate laundry furniture to access.
9.1	90 Elbow	6"	1	C-P2.03	Orchestra	Workshop Classroom	None	None	None			1	Pipe found to be solid and well braced. Elbow picks-up RD above. Not a base 90, short vertical drop, no thrust load, no JR needed.
9.2	45 Elbow	6"	2	C-P2.03	Orchestra	Workshop Classroom	None	None	None			2	Horizontal 45 elbow. Pipe found to be solid and well braced No thrust load, no JR needed.
11	90 Elbow	6"	1	C-P2.05	Box Tier	Choral Assembly	None	None	None			1	Pipe found to be solid and well braced. Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed.
11.1	45 Elbow	6"	2	C-P2.05	Box Tier	Choral Assembly	None	None	None			2	Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed. Pipe found to be solid and well braced.
11.2	Wye	6"	1	C-P2.05	Box Tier	Choral Assembly	None	None	None			1	Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed. Pipe found to be solid and well braced.
14	90 Elbow	6"	2	C-P2.06	Box Tier	Women Dressing	None	None	None			2	Pipe found to be solid and well braced Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed.
14.1	Wye	6"	1	C-P2.06	Box Tier	Women Dressing	None	None	None			1	Fitting is horizontal, i.e. subjected to no thrust load; no JR needed. Pipe found to be solid and well braced.
20	90 Elbow	6"	3	C-P2.11	Third Tier	Lobby & Restroom East	None	None	None		1	2	Pipe found to be solid and well braced Base 90 elbow under riser - JR to be specified. Horizontal 90 elbow and 90 degree elbow that turns down (top of riser) has no thrust load and no JR needed.
20.1	45 Elbow	6"	5	C-P2.11	Third Tier	Lobby & Restroom East	None	None	None			5	Pipe found to be solid and well braced. Fittings are horizontal, i.e. subjected to no thrust loads; no JR needed.

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

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							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
20.2	Wye	6"	1	C-P2.11	Third Tier	Lobby & Restroom East	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load; no JR needed.
21	Wye	6"	1	C-P2.11	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load; no JR needed.
22	90 Elbow	6"	2	C-P2.11	Third Tier	Lobby & Restroom West	None	None	None		1	1	Pipe found to be solid and well braced. Base 90 elbow under riser - JR to be specified. Horizontal 90 elbow in toilet room chase has no thrust load and no JR needed.
22.1	45 Elbow	6"	3	C-P2.11	Third Tier	Lobby & Restroom West	None	None	None			3	Pipe found to be solid and well braced Fittings are horizontal, i.e. subjected to no thrust loads; no JR needed.
27	90 Elbow	6"	2	C-P2.14	Catwalk	East Chase above Side Circulation	None	None	None		2		Pipe is solid and well braced. Fittings may be subjected to thrust loads from risers above - JR to be specified.
28	90 Elbow	6"	2	C-P2.14	Catwalk	West Chase above Side Circulation	None	None	None		2		Pipe is solid and well braced. Fittings may be subjected to thrust loads from risers above - JR to be specified.
29	90 Elbow	6"	3	C-P2.17	Attic	Attic Level East Side	None	None	None			3	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
30.4	Wye	6"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
31	90 Elbow	6"	4	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			4	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
31.1	45 Elbow	6"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.
31.2	Wye	6"	1	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			1	Pipe found solid and well braced. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.
32	Wye	6"	1	C-P2.18	Attic	Attic Level Southeast MER	None	None	None			1	Pipe found solid and well braced. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.
23.2	45 Elbow	6"	2	C-P2.12	Third Tier	Mechanical Room East	None	None	None			2	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
29.1	45 Elbow	6"	1	C-P2.17	Attic	Attic Level East Side	None	None	None			1	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.

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							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
30.2	45 Elbow	6"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
5.2	Coupling "Rusted"	8"	3	C-P2.02	Orchestra	Production Office	None	None	None	3			Rusted NH Coupling to be replaced
3	90 Elbow	8"	3	C-P2.02	Orchestra	Restroom	None	None	None		1	2	Pipe found to be solid and well braced. Will require access panels. Base 90 should have JR specified. Other 90 degree fittings not subjected to thrust loads and no JR needed.
5	90 Elbow	8"	2	C-P2.02	Orchestra	Production Office	None	None	None		1	1	Pipe found to be solid and well braced. Base 90 difficult but can be done - JR should be specified. Other horizontal 90s above ductwork have no thrust load and no JR needed.
5.1	45 Elbow	8"	2	C-P2.02	Orchestra	Production Office	None	None	None			2	Pipe found to be solid and well braced. Horizontal 45 elbow above ductwork has no load, no thrust and no JR needed.
9	90 Elbow	8"	2	C-P2.03	Orchestra	Workshop Classroom	None	None	None		1	1	One 90 degree fitting to have JR specified. Second 90 elbow is in the chase and partially set into CMU chase wall. Is solid, no movement, no JR needed.
10	90 Elbow	8"	2	C-P2.05	Box Tier	Men's Restroom	None	None	None		1	1	Base elbow to have unistrut to support bottom of elbow as a JR. Pipe found to be solid and well braced. Other 90 elbow turns down (is a top of riser) and has no load, no thrust and no JR necessary.
12	90 Elbow	8"	2	C-P2.05	Box Tier	Corridor	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow to have JR specified. Second 90 elbow is horizontal with no thrust load, no JR needed.
13	90 Elbow	8"	1	C-P2.05	Box Tier	Chase Between Women's & Stair	None	None	None			1	Piping well secured, solid to CMU chase wall between tiled men's and women's toilet. Not a base 90 and no thrust load - No JR needed.
13.1	Wye	8"	1	C-P2.05	Box Tier	Chase Between Women's & Stair	None	None	None			1	Piping well secured, solid to CMU chase wall between tiled men's and women's toilet. No JR needed.
15.2	90 Elbow	8"	1	C-P2.06	Box Tier	Men's Dressing	None	None	None		1		Base elbow at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
15.3	45 Elbow	8"	2	C-P2.06	Box Tier	Men's Dressing	None	None	None		2		Base elbow at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
16	Pipe	8"	1	C-P2.06	Box Tier	Mechanical Room West	None	None	1				Will install sway brace to column.
16.1	90 Elbow	8"	2	C-P2.06	Box Tier	Mechanical Room West	None	None	None		1	1	Base 90 elbow under riser - JR to be specified. Horizontal 90 elbow has no thrust load and no JR needed.
16.2	45 Elbow	8"	2	C-P2.06	Box Tier	Mechanical Room West	None	None	None			2	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load; no JR needed.

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers
**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
17	90 Elbow	8"	2	C-P2.06	Box Tier	Donor's Lounge	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof above - approx 3'. Not subjected to thrust load, no JR needed. Pipe found to be solid and well braced.
17.1	45 Elbow	8"	1	C-P2.06	Box Tier	Donor's Lounge	None	None	None			1	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'. Not subjected to thrust loads, no JR needed. Pipe found to be solid and well braced.
17.2	Wye	8"	2	C-P2.06	Box Tier	Donor's Lounge	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'. Not subjected to thrust loads, no JR needed. Pipe found to be solid and well braced.
18	90 Elbow	8"	2	C-P2.08	Second Tier	Handicapped Restroom	None	None	None		1	1	Base 90 elbow under riser - JR to be specified. Second 90 elbow turns down (top of riser) has no thrust load and no JR needed. Pipe found to be solid and well braced.
19	90 Elbow	8"	2	C-P2.09	Second Tier	Mechanical Room East	None	None	None		2		Back-to-back base 90 elbows under riser - JR to be specified. Pipe found to be solid and well braced.
19.1	NH Coupling	8"	4	C-P2.09	Second Tier	Mechanical Room East	None	None	None	4			Stripped NH Coupling to be replaced.
22.2	Wye	8"	1	C-P2.11	Third Tier	Lobby & Restroom West	None	None	None			1	Pipe found to be solid and well braced. Fitting is a turned-down wye (top of riser) in the toilet chase and subjected to no thrust load; no JR needed.
23	90 Elbow	8"	1	C-P2.12	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
23.1	45 Elbow	8"	1	C-P2.12	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
23.3	Wye	8"	1	C-P2.12	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
24	90 Elbow	8"	4	C-P2.12	Third Tier	Mechanical Room West	None	None	None		4		Pipe is solid and well braced. Fittings may be subjected to thrust loads from risers above - JR to be specified. Access on top of ductwork.
24.1	45 Elbow	8"	1	C-P2.12	Third Tier	Mechanical Room West	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
24.2	Wye	8"	1	C-P2.12	Third Tier	Mechanical Room West	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
25.1	90 Elbow	8"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3' drop. Not subjected to thrust loads, no JR needed.
26.1	90 Elbow	8"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
30	90 Elbow	8"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
30.3	Wye	8"	1	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			1	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
33	90 Elbow	8"	6	C-P2.18	Attic	Attic Level Southwest MER	None	None	None		3	3	Pipe appeared to be solid and well braced. Three 90 elbows at bottom of risers may be subjected to thrust loads - JRs to be specified. Three 90 elbows are horizontal or turned-down (top of riser) and not subjected to thrust loads - no JR needed.
33.1	45 Elbow	8"	4	C-P2.18	Attic	Attic Level Southwest MER	None	None	None			4	Piping appeared to be well supported and braced. Fitting not at the bottom of risers with no thrust loads. No JR needed.
33.2	Wye	8"	1	C-P2.18	Attic	Attic Level Southwest MER	None	None	None			1	Piping appeared to be well supported and braced. Fitting not at the bottom of risers with no thrust loads. No JR needed.
26.3	45 Elbow	8"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Pipe found to be solid and well braced. Fitting is horizontal subjected to no thrust load; no JR needed.
30.1	45 Elbow	8"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
8	22.5 Elbow	10"	2	C-P2.03	Orchestra	Loading Dock	None	None	None			2	Pipe behind ductwork is solid, vertical offsets, no thrust load, no JR needed.
9.3	Wye	10"	1	C-P2.03	Orchestra	Workshop Classroom	None	None	None			1	Horizontal wye. Pipe found to be solid and well braced. No thrust load, no JR needed.
16.3	Wye	10"	1	C-P2.06	Box Tier	Mechanical Room West	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load; no JR needed.

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
25	90 Elbow	10"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Pipe appeared to be well anchored to the shear wall. 90 elbows at the bottom of approx. 12' riser. Should not be subjected to unresisted thrust loads. Access maybe available from Upper Third Tier slab (New AP). May need further evaluation.
25.2	Wye	10"	1	C-P2.13	Catwalk	Main Lobby	None	None	None			1	Pipe appeared to be solid and well braced. Fitting is a turned-down (top of riser) wye subjected to no thrust load; no JR needed.
1A	90 Elbow	12"	1	C-P2.01	Orchestra	Concrete Shear Wall	None	None	None			1	Pipe appeared to be solid and well braced. 90 base elbow is in encased concrete shear wall.
7	45 Elbow	12"	2	C-P2.03	Orchestra	General Storage	None	None	None			2	Pipe solidly anchored to wall. Vertical 45 offset. No thrust. No JR needed.
15	45 Elbow	12"	1	C-P2.06	Box Tier	Men's Dressing	None	None	None		1		Base elbow at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
15.1	Wye	12"	2	C-P2.06	Box Tier	Men's Dressing	None	None	None		2		Base wye at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
26	90 Elbow	12"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Pipe found to be solid and well braced. 1 Fitting is a turned-down (top of riser) 90 and the other was a horizontal 90 subjected to no thrust load; no JR needed.
26.2	45 Elbow	12"	3	C-P2.13	Catwalk	Main Lobby	None	None	None			3	Pipe found to be solid and well braced. Fitting is horizontal subjected to no thrust load; no JR needed.
26.4	Wye	12"	1	C-P2.13	Catwalk	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal subjected to no thrust load; no JR needed.
	TOTALS		146				1	0	2	7	30	106	

Attachment B

PAC Ballet Opera House Scope of Work for Rain Water Leaders (RWL)

Rev: 12 Nov 2014

Item #	Description	Size	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Coupling	Joint Restraint
1	90 Elbow	10"	B-P2.03	Orchestra	Main Lobby					1
2	90 Elbow	12"	B-P2.03	Orchestra	Main Lobby					1
3	90 Elbow	10"	B-P2.03	Orchestra	Main Lobby					1
4	90 Elbow	8"	B-P2.04	Orchestra	Main Lobby					2
5	90 Elbow	6"	B-P2.04	Orchestra	Main Lobby					1
8	Pipe Sway Brace	4"	B-P2.07	Box Tier	Donor's Lounge			1		
9	90 Elbow	8"	B-P2.07	Box Tier	Chorus Restroom					1
9.1	90 Elbow	6"	B-P2.07	Box Tier	Chorus Restroom					1
11	Pipe	15"	B-P2.08	Box Tier	Toilet	1				
11.1	90 Elbow	15"	B-P2.08	Box Tier	Chorus & Toilet					1
13	90 Elbow	10"	B-P2.09	Box Tier	Mechanical Room -					1
15	90 Elbow	8"	B-P2.09	Box Tier	Mechanical Room					1
19	Pipe	8"	B-P2.14	Second Tier	Chiller Plant		1			
21	Pipe	12"	B-P2.15	Third Tier	East MER	1				
21.1	90 Elbow	12"	B-P2.15	Third Tier	East MER					1
22.1	90 Elbow	6"	B-P2.15	Third Tier	West MER -					1
22.3	Wye	8"	B-P2.15	Third Tier	West MER -					1
24.2	90 Elbow	6"	B-P2.16	Third Tier	Chiller Plant & CEO -					1
25	Pipe	12"	B-P2.16	Third Tier	Mech Duct Space	1				
25.1	NH Coupling	12"	B-P2.16	Third Tier	Mech Duct Space				1	
25.2	90 Elbow	12"	B-P2.16	Third Tier	Mech Duct Space					1
25.3	90 Elbow	8"	B-P2.16	Third Tier	Mech Duct Space					3
31	Pipe	3"	B-P2.18	Intermediate	West MER			1		
31.1	Pipe	8"	B-P2.18	Intermediate	West MER			1		
35	90 Elbow	8"	B-P2.20	Fourth Tier	Above Dimmer & IT East					1
36	Pipe	12"	B-P2.21	Attic	Lower Attic			3		
37	Pipe	10"	B-P2.22	Attic	North Attic Above IT Area			1		
37.1	90 Elbow	12"	B-P2.22	Attic	North Attic Above IT Area -					2
37.2	90 Elbow	10"	B-P2.22	Attic	North Attic Above IT Area -					3
38	Pipe	10"	B-P2.24	Attic	Upper Attic			1		
38.1	Pipe	8"	B-P2.24	Attic	Upper Attic	1				
	TOTALS					4	1	8	1	25

PAC Concert Hall Scope of Work for Rain Water Leaders (RWL)

Rev: 12 Nov 2014

Item #	Description	Size	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Coupling	Joint Restraint
1	Additional bracket	4"	C-P2.01	Orchestra	Orch Lobby above elect rm	1				
3	90 Elbow	8"	C-P2.02	Orchestra	Restroom					1
5	90 Elbow	8"	C-P2.02	Orchestra	Production Office					1
5.2	Coupling "Rusted"	8"	C-P2.02	Orchestra	Production Office				3	
12	90 Elbow	8"	C-P2.05	Box Tier	Corridor					1
14.2	Pipe	4"	C-P2.06	Box Tier	Women Dressing			1		
15	45 Elbow	12"	C-P2.06	Box Tier	Men's Dressing					1
15.1	Wye	12"	C-P2.06	Box Tier	Men's Dressing					2
15.2	90 Elbow	8"	C-P2.06	Box Tier	Men's Dressing					1
16	Pipe	8"	C-P2.06	Box Tier	Mechanical Room West			1		
18	90 Elbow	8"	C-P2.08	Second Tier	Handicapped Restroom					1
19	90 Elbow	8"	C-P2.09	Second Tier	Mechanical Room East					2
19.1	NH Coupling	8"	C-P2.09	Second Tier	Mechanical Room East				4	
24	90 Elbow	8"	C-P2.12	Third Tier	Mechanical Room West -					3
27	90 Elbow	6"	C-P2.14	Catwalk	East Chase above Side Circulation					2
28	90 Elbow	6"	C-P2.14	Catwalk	West Chase above Side Circulation					2
33	90 Elbow	8"	C-P2.18	Attic	Attic Level Southwest MER -					3
	TOTALS					1	0	2	7	20

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BMP

Attachment C
INSURANCE

PACB shall furnish to the Miami Dade County, 111 NW 1st Street 24th Floor, Miami, Florida 33128, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

A. Worker's Compensation Insurance for all employees of PACB as required by Florida Statute 440.

B. Commercial General Liability Insurance including Products and Completed Operations, on a comprehensive basis in an amount not less than $5,000,000 combined single limit per occurrence for bodily injury and property damage. **Miami-Dade County must be shown as an additional insured with respect to this coverage.**

C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than $1,000,000 combined single limit per occurrence for bodily injury and property damage.

D. Professional Liability Insurance in an amount not less than $5,000,000. Coverage must be maintained for a minimum of ten years after project completion.

All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than "A-" as to management, and no less than "Class VII" as to financial strength, by the latest edition of Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

or

The company must hold a valid Florida Certificate of Authority as shown in the latest "List of All Insurance Companies Authorized or Approved to Do Business in Florida" issued by the State of Florida Department of Insurance and are members of the Florida Guaranty Fund.

Compliance with the foregoing requirements shall not relieve the PACB of liability and obligation under this section or under any other section of this agreement.

BMR

PAC Ballet Opera House Scope of Work for Rain Water Leaders (RWL)

Rev: 12 Nov 2014

Item #	Description	Size	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Coupling	Joint Restraint
1	90 Elbow	10"	B-P2.03	Orchestra	Main Lobby					1
2	90 Elbow	12"	B-P2.03	Orchestra	Main Lobby					1
3	90 Elbow	10"	B-P2.03	Orchestra	Main Lobby					1
4	90 Elbow	8"	B-P2.04	Orchestra	Main Lobby					2
5	90 Elbow	6"	B-P2.04	Orchestra	Main Lobby					1
8	Pipe Sway Brace	4"	B-P2.07	Box Tier	Donor's Lounge			1		
9	90 Elbow	8"	B-P2.07	Box Tier	Chorus Restroom					1
9.1	90 Elbow	6"	B-P2.07	Box Tier	Chorus Restroom					1
11	Pipe	15"	B-P2.08	Box Tier	Toilet	1				
11.1	90 Elbow	15"	B-P2.08	Box Tier	Chorus & Toilet					1
13	90 Elbow	10"	B-P2.09	Box Tier	Mechanical Room -					1
15	90 Elbow	8"	B-P2.09	Box Tier	Mechanical Room					1
19	Pipe	8"	B-P2.14	Second Tier	Chiller Plant		1			
21	Pipe	12"	B-P2.15	Third Tier	East MER	1				
21.1	90 Elbow	12"	B-P2.15	Third Tier	East MER					1
22.1	90 Elbow	6"	B-P2.15	Third Tier	West MER -					1
22.3	Wye	8"	B-P2.15	Third Tier	West MER -					1
24.2	90 Elbow	6"	B-P2.16	Third Tier	Chiller Plant & CEO -					1
25	Pipe	12"	B-P2.16	Third Tier	Mech Duct Space	1				
25.1	NH Coupling	12"	B-P2.16	Third Tier	Mech Duct Space				1	
25.2	90 Elbow	12"	B-P2.16	Third Tier	Mech Duct Space					1
25.3	90 Elbow	8"	B-P2.16	Third Tier	Mech Duct Space					3
31	Pipe	3"	B-P2.18	Intermediate	West MER			1		
31.1	Pipe	8"	B-P2.18	Intermediate	West MER			1		
35	90 Elbow	8"	B-P2.20	Fourth Tier	Above Dimmer & IT East					1
36	Pipe	12"	B-P2.21	Attic	Lower Attic			3		
37	Pipe	10"	B-P2.22	Attic	North Attic Above IT Area			1		
37.1	90 Elbow	12"	B-P2.22	Attic	North Attic Above IT Area -					2
37.2	90 Elbow	10"	B-P2.22	Attic	North Attic Above IT Area -					3
38	Pipe	10"	B-P2.24	Attic	Upper Attic			1		
38.1	Pipe	8"	B-P2.24	Attic	Upper Attic	1				
	TOTALS					4	1	8	1	25

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ATTACHMENT 1 - EXHIBIT B

PAC Concert Hall Scope of Work for Rain Water Leaders (RWL)

Rev: 12 Nov 2014

Item #	Description	Size	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Coupling	Joint Restraint
1	Additional bracket	4"	C-P2.01	Orchestra	Orch Lobby above elect rm	1				
3	90 Elbow	8"	C-P2.02	Orchestra	Restroom					1
5	90 Elbow	8"	C-P2.02	Orchestra	Production Office					1
5.2	Coupling "Rusted"	8"	C-P2.02	Orchestra	Production Office				3	
12	90 Elbow	8"	C-P2.05	Box Tier	Corridor					1
14.2	Pipe	4"	C-P2.06	Box Tier	Women Dressing			1		
15	45 Elbow	12"	C-P2.06	Box Tier	Men's Dressing					1
15.1	Wye	12"	C-P2.06	Box Tier	Men's Dressing					2
15.2	90 Elbow	8"	C-P2.06	Box Tier	Men's Dressing					1
16	Pipe	8"	C-P2.06	Box Tier	Mechanical Room West			1		
18	90 Elbow	8"	C-P2.08	Second Tier	Handicapped Restroom					1
19	90 Elbow	8"	C-P2.09	Second Tier	Mechanical Room East					2
19.1	NH Coupling	8"	C-P2.09	Second Tier	Mechanical Room East				4	
24	90 Elbow	8"	C-P2.12	Third Tier	Mechanical Room West -					3
27	90 Elbow	6"	C-P2.14	Catwalk	East Chase above Side Circulation					2
28	90 Elbow	6"	C-P2.14	Catwalk	West Chase above Side Circulation					2
33	90 Elbow	8"	C-P2.18	Attic	Attic Level Southwest MER -					3
	TOTALS					1	0	2	7	20

Attachment C
INSURANCE

PACB shall furnish to the Miami Dade County, 111 NW 1st Street 24th Floor, Miami, Florida 33128, Certificate(s) of Insurance which indicate that insurance coverage has been obtained which meets the requirements as outlined below:

A. Worker's Compensation Insurance for all employees of PACB as required by Florida Statute 440.

B. Commercial General Liability Insurance including Products and Completed Operations, on a comprehensive basis in an amount not less than $5,000,000 combined single limit per occurrence for bodily injury and property damage. **Miami-Dade County must be shown as an additional insured with respect to this coverage.**

C. Automobile Liability Insurance covering all owned, non-owned and hired vehicles used in connection with the work, in an amount not less than $1,000,000 combined single limit per occurrence for bodily injury and property damage.

D. Professional Liability Insurance in an amount not less than $5,000,000. Coverage must be maintained for a minimum of ten years after project completion.

All insurance policies required above shall be issued by companies authorized to do business under the laws of the State of Florida, with the following qualifications:

The company must be rated no less than "A-" as to management, and no less than "Class VII" as to financial strength, by the latest edition of Best's Insurance Guide, published by A.M. Best Company, Oldwick, New Jersey, or its equivalent, subject to the approval of the County Risk Management Division.

or

The company must hold a valid Florida Certificate of Authority as shown in the latest "List of All Insurance Companies Authorized or Approved to Do Business in Florida" issued by the State of Florida Department of Insurance and are members of the Florida Guaranty Fund.

Compliance with the foregoing requirements shall not relieve the PACB of liability and obligation under this section or under any other section of this agreement.

BHR

Attachment

Pena report

ATTACHMENT 2

RPJ Inc.
CONSULTING ENGINEERS

May 9, 2014

Miami-Dade County
111 NW 1st Street, Suite 2810
Miami, FL 33128
Attn: Mr. Daniel Frastai, Assistant County Attorney

Moye, O'Brien, O'Rourke, Pickert & Dillon, LLP
800 South Orlando Avenue
Maitland, FL 32751
Attn: Mr. James E. Moye, Esq.

Re: PAC Arbitration regarding Rain Water Leaders

Dear Mr. Frastai and Mr. Moye,

Please find attached our findings and arbitration results.

Regards,

Rafael Peña, Jr., P.E.
RPJ, Inc.

4977 S.W. 74th Court, Miami, FL 33155 • Phone: (305) 666-2131 • Fax: (305) 666-0131
E-Mail: rpj@rpjmep.com • Website: www.rpjmep.com

Miami-Dade County
Attn: Mr. Daniel Frastai, Assistant County Attorney

Moye, O'Brien, O'Rourke, Pickert & Dillon, LLP
Attn: Mr. James E. Moye, Esq.

Re: PAC Arbitration regarding Rain Water Leaders
Page Two
May 9, 2014

INTRODUCTION

Back on May 20th, 2012 during an evening performance, a rainwater leader at the Ziff Ballet Opera House, known as ZBOH, failed at the elbow joint causing rain water to infiltrate the building flooding portions of the building. This incident caused significant damage to the building interiors and some of the building mechanical/electrical systems. The joint that failed was temporarily repaired while the cause of the failure was investigated.

On April 8, 2013 the County and the Performing Arts Center Bidder, JV entered into an agreement to perform an agreed scope of work for sway bracing hanger/supports and old couplings replacement. This agreement did not include a scope of work for joint restraints since there was no consensus on this issue.

Our office was commissioned to serve as an in depended third party engineer/arbitrator to review the present storm drainage collection system (known as the Rain Water Leader System) at the Adrienne Arsht Center for the Performing Arts (know as PAC) of Dade County. The following documents were made available and reviewed by our office:

1) Miami Dade County's Position Paper.
2) Evaluation Report by Slider Engineering Group.
3) Project Contract drawings and specifications.
4) Applicable material catalogs cut/data sheets.
5) List of applicable Standards and Building Codes.
6) Pictures of several existing RWL System depicting actual conditions.
7) Copy of Agreement regarding performance of Rain Water leader System Work.
8) Performing Arts Center Builder, JV (known as PACB) position statement.

9) Copies of applicable Shop Drawings. Engineer of Record review comments and approval stamps.
10) Original Amended Agreement between Miami-Dade County and Construction Manager, dated October 9, 2001
11) Copy of Change Order 73 amending original Agreement.
12) Evaluation report by Anderson-Williams Consulting Engineer.
13) Copies of Steven Feller, PE letter dated May 31, 2013.

In addition, a visit to the PAC was conducted on March 31, 2014 to observe some of the existing RWL conditions and the repair work performed back in 2012.

The basic intent of this arbitration is to determine the following:

1) Are joint restraints required at every joint at every change of pipe direction?
2) Or, if joint restraints are required at specific locations based on an engineering evaluation.
3) If joint restraints, if necessary, were to be provided by PACB under its Amended Agreement, including Change Order 73, with the County.

FINDINGS

The building primary RWL System consisted of no-hub cast iron soil pipe and fittings (known as hubless) collecting roof drains through a vertical/horizontal piping system and discharging to in-ground drainage wells. The pipe and fittings are joined by no-hub couplings.

The applicable Building Codes and Industrial Standards are as follows:

1) South Florida Building Code (SFBC) 1994 Dade County Edition with supplement No. 5 dated 1998
2) Cast Iron Soil Pipe Institute, CISPI, 301-00 and 310-00

The applicable design documents are the Project Contract Drawings and Specifications. The materials used in the RWL System were cast iron soil pipe as manufactured by Tyler Pipe and No-Hub Couplings as manufactured by Pro-Flo and Anaco.

The nature of the use of these buildings have dictated sophisticated acoustical and vibration design parameters not just for the building but also for the integral mechanical/plumbing systems.

During the Construction Administration Phase, consisting of shop drawings review and field inspections, the need for joint restraints was not brought up to the PABC neither by the Professionals nor the Inspectors responsible for those tasks.

CONCLUSIONS

After review of the applicable SFBC and Contract Documents/Specifications it is our professional opinion that joint restraints **were not required** neither by the SFBC or contract documents.

The applicable design standards offer non-mandatory recommendations which are only that.

Also, the no-hub coupling manufacturer's installation guidelines do not mention joint restraints but supports.

It is our judgment that joint restraints be implemented in certain locations as marked up in copies of Exhibit 'E', provided by the County.

Miami-Dade County
Attn: Mr. Daniel Frastai, Assistant County Attorney

Moye, O'Brien, O'Rourke, Pickert & Dillon, LLP
Attn: Mr. James E. Moye, Esq.

Re: PAC Arbitration regarding Rain Water Leaders
Page FIVE
May 9, 2014

ARBITRATION ASSESSMENT

1) (a) Joint restrains **are not required** at every joint at every change of pipe direction.

(b) Joint restrains, in our professional opinion, **are required** at specific locations specified here in.

2) Refer to marked-up copy of Appendix 'E', provided by Dade County, for our recommended locations of joint restraints.

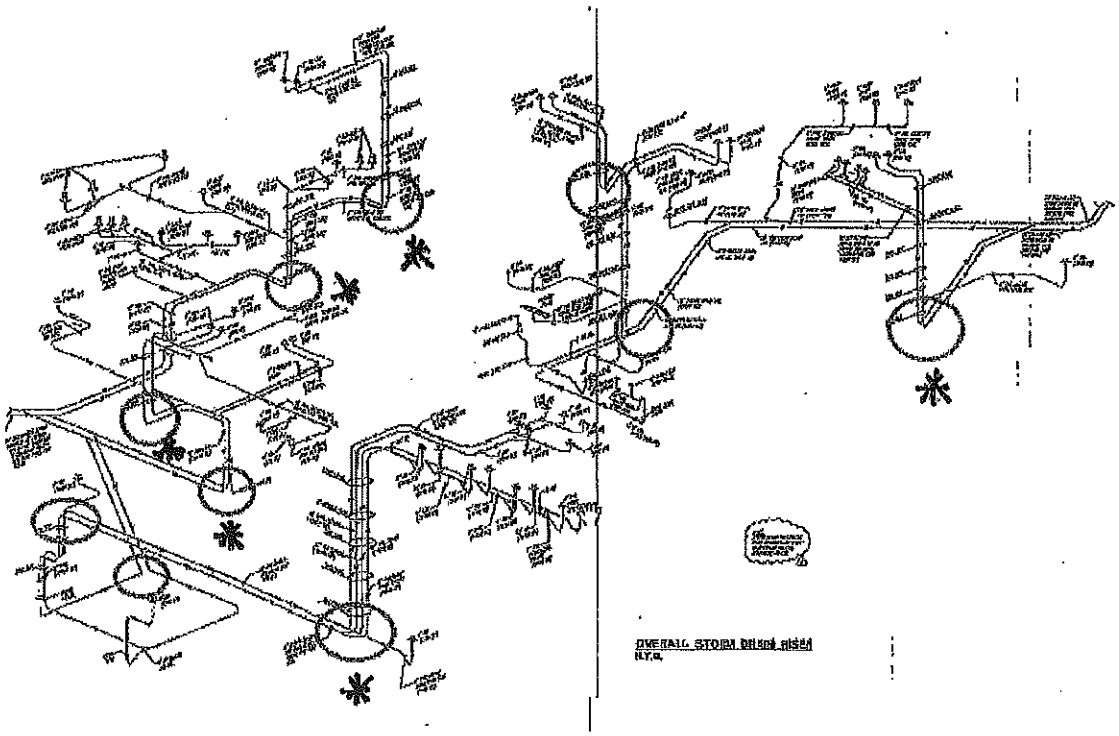
3) Based on a review of the RWL system at the Performing Arts Center of Greater Miami, the design drawings and specifications, applicable codes and industry standards-of-care, the implementation of my developed attached scope of work (joint restraints only) **was not required** by PAC Builders under its Amended Agreement, including Change Order 73, with the County.

This assessment was based on our evaluation of all documents listed herein and our professional engineering expertise.

Sincerely,

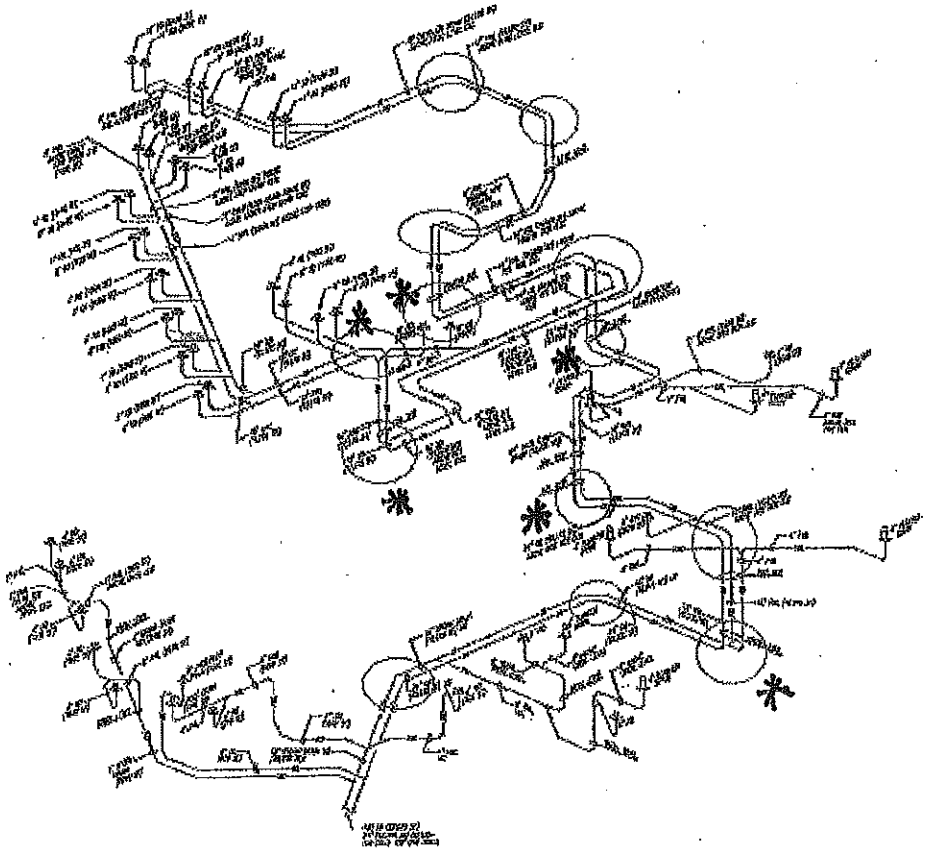
Rafael Peña, Jr., PE

Attachement



* INDICATE LOCATION OF PROPOSED JR's

EXHIBIT "E"



* INDICATE LOCATION OF PROPOSED JPLs

JOINT RESTRAINTS PROPOSED BY ENGINEER/ARBITRATOR

5-30-14

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
31	Pipe	3"	1	B-P2.18	Intermediate	West MER	None	None	1				Brace 3" vent piping which appeared not to be sufficiently braced.
8	Pipe Sway Brace	4"	1	B-P2.07	Box Tier	Donor's Lounge	None	None	1				4" pipe appeared not to be solid or well braced - will add sway brace.
34.2	90 Elbow	5"	3	B-P2.19	Fourth Tier	Main Lobby	None	None	None			3	Pipe appeared to be solid and well supported. These 90 elbows pick-up RD above with short vertical drop from RD - no JR needed.
5	90 Elbow	6"	2	B-P2.04	Orchestra	Main Lobby	None	None	None		X	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
5.1	45 Elbow	6"	1	B-P2.04	Orchestra	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Horizontal 45 elbow has no load, no thrust and no JR needed.
7	90 Elbow	6"	4	B-P2.07	Box Tier	Restaurant	None	None	None			4	Using access panels, confirmed that pipe was solid and well braced. Pipe ties is above Venetian Plaster Ceiling. Pipe fittings are not at the base of a riser and not subjected to thrust loads - no JR needed.
7.1	45 Elbow	6"	1	B-P2.07	Box Tier	Restaurant	None	None	None			1	Pipe found to be solid and well braced. Vertical (turned down) 45 elbow has no load, no thrust and no JR needed.
7.3	Wye	6"	1	B-P2.07	Box Tier	Restaurant	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal and has no load, no thrust and no JR needed.
8.1	90 Elbow	6"	4	B-P2.07	Box Tier	Donor's Lounge	None	None	None			4	Pipe found to be solid and well braced. Elbow picks-up RD above. Is initially horizontal pipe, not a base 90 under tall riser. Has short vertical drop, no thrust load, no JR needed.
8.2	45 Elbow	6"	2	B-P2.07	Box Tier	Donor's Lounge	None	None	None			2	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
8.4	Wye	6"	2	B-P2.07	Box Tier	Donor's Lounge	None	None	None			2	Pipe found to be solid and well braced. Wye is horizontal pipe with no thrust load, no JR needed.
9.1	90 Elbow	6"	1	B-P2.07	Box Tier	Chorus Restroom	None	None	None		X		Pipe found to be solid and well braced. However, 90 elbow is at the bottom of a riser - JR to be specified.
9.2	45 Elbow	6"	1	B-P2.07	Box Tier	Chorus Restroom	None	None	None			1	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
9.3	Wye	6"	1	B-P2.07	Box Tier	Chorus Restroom	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal pipe with no thrust load, no JR needed.
10	90 Elbow	6"	3	B-P2.08	Box Tier	Chorus & Perf Lounge	None	None	None			3	Pipe found to be solid and well braced. One elbow picks-up RD above, not a base 90 under tall riser. Has short vertical drop from RD. Second 90 is horizontal and third 90 is at top of riser (turned down). These are not subjected to thrust loads, no JR needed.

Attachment B

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) – This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) – This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
10.1	45 Elbow	6"	2	B-P2.08	Box Tier	Chorus & Perf Lounge	None	None	None			2	Pipe found to be solid and well braced. 45 elbow is vertical turned down fitting with no thrust load, no JR needed.
11.2	90 Elbow	6"	1	B-P2.08	Box Tier	Chorus & Toilet	None	None	None			1	Pipe found to be solid and well braced. This 90 elbow picks-up RD above with short vertical drop from RD. Not subjected to thrust loads, no JR needed.
12	90 Elbow	6"	1	B-P2.08	Box Tier	Children's	None	None	None			1	Pipe found to be solid and well braced. 90 elbow picks-up RD above, not a base 90 under tall riser. Has short vertical drop from RD and not subjected to thrust loads, no JR needed.
13.1	90 Elbow	6"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. 90 elbow picks-up small RD above with short vertical drop from RD and not subjected to thrust loads, no JR needed.
14	90 Elbow	6"	2	B-P2.09	Box Tier	Mechanical Room	None	None	None			2	Pipe found to be solid and well braced. One elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is at the top of riser (turned down). These are not subjected to thrust loads, no JR needed.
14.1	45 Elbow	6"	2	B-P2.09	Box Tier	Mechanical Room	None	None	None			2	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
17	90 Elbow	6"	3	B-P2.09	Box Tier	Studio Storage	None	None	None			3	Pipe found to be solid and well braced. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Other 90s are at the top of riser (turned down). These are not subjected to thrust loads, no JR needed.
17.1	45 Elbow	6"	11	B-P2.09	Box Tier	Studio Storage	None	None	None			11	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
17.3	Wye	6"	1	B-P2.09	Box Tier	Studio Storage	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
18	90 Elbow	6"	3	B-P2.12	Second Tier	West MER	None	None	None			3	Pipe found to be solid and well braced. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is at the top of riser (turned down). Third 90 is horizontal with no thrust load. These are not subjected to thrust loads, no JR needed.
19.2	90 Elbow	6"	3	B-P2.14	Second Tier	Chiller Plant	None	None	None			3	Pipe found to be solid and well braced. 90 elbows pick-up RD above with short vertical drop from RD - no JR needed.
19.3	45 Elbow	6"	2	B-P2.14	Second Tier	Chiller Plant	None	None	None			2	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
19.5	Wye	6"	1	B-P2.14	Second Tier	Chiller Plant	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
22.1	90 Elbow	6"	1	B-P2.15	Third Tier	West MER	None	None	None		X		Piping found solid and well braced. 90 elbow is a base 90 at bottom of riser and should have JR specified.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers
**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
22.2	45 Elbow	6"	3	B-P2.15	Third Tier	West MER	None	None	None			3	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
22.4	Wye	6"	1	B-P2.15	Third Tier	West MER	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
23	90 Elbow	6"	1	B-P2.16	Third Tier	Ken's Office	None	None	None			1	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.
23.1	Wye	6"	1	B-P2.16	Third Tier	Ken's Office	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
24.2	90 Elbow	6"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None		1		Piping appeared to be solid and well braced. 90 elbow is a base 90 at bottom of riser and should have JR specified.
24.6	Wye	6"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
25.4	90 Elbow	6"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None			2	Pipe found to be solid and well braced. 90 elbows pick-up RD above with short vertical drop from RD. No thrust loads - no JR needed.
25.8	Wye	6"	1	B-P2.16	Third Tier	Mech Duct Space	None	None	None			1	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
26	90 Elbow	6"	2	B-P2.17	Intermediate	East MER	None	None	None			2	Pipe found to be solid and well braced and tight to the slab. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is horizontal with no thrust load. These are not subjected to thrust loads, no JR needed.
29	45 Elbow	6"	2	B-P2.17	Intermediate	West MER	None	None	None			2	Pipe found to be solid and well braced. 45 elbows are vertical with no thrust load, no JR needed.
30	90 Elbow	6"	2	B-P2.18	Intermediate	West MER	None	None	None			2	Pipe found to be solid and well braced. One 90 elbow picks-up RD above with short vertical drop from RD - no JR needed. Second 90 is horizontal with no thrust load. These are not subjected to thrust loads, no JR needed.
30.1	45 Elbow	6"	3	B-P2.18	Intermediate	West MER	None	None	None			3	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
32	90 Elbow	6"	2	B-P2.18	Intermediate	North MER	None	None	None			2	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and second 90 elbow is horizontal - not subjected to thrust loads - no JR.
32.1	Wye	6"	2	B-P2.18	Intermediate	North MER	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
33.1	90 Elbow	6"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Pipe found to be solid and well braced tight to structure. 90 elbow picks-up RD above with short vertical drop from RD - no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers
**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
36.3	90 Elbow	6"	4	S-P2.21	Attic	Lower Attic	None	None	None			4	Pipe found to be well supported and braced. These 90 elbows pick-up RD/trench above with short vertical drop from RD - no JR needed.
37.3	90 Elbow	6"	1	S-P2.22	Attic	North Attic Above IT Area	None	None	None			1	Pipe found to be well supported and braced tight to structure. These 90 elbows are horizontal and not subjected to thrust loads - no JR needed.
37.9	Wye	6"	3	S-P2.22	Attic	North Attic Above IT Area	None	None	None			3	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
38.4	90 Elbow	6"	2	S-P2.24	Attic	Upper Attic	None	None	None			2	Pipe found to be well supported and braced. These 90 elbows pick-up RD above with short vertical drop from RD - no JR needed.
38.6	45 Elbow	6"	3	S-P2.24	Attic	Upper Attic	None	None	None			3	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
38.8	Wye	6"	1	S-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
4	90 Elbow	8"	2	S-P2.04	Orchestra	Main Lobby	None	None	None		2	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
4.1	45 Elbow	8"	1	S-P2.04	Orchestra	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Horizontal 45 elbow has no load, no thrust and no JR needed.
4.2	Wye	8"	1	S-P2.04	Orchestra	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Horizontal wye has no load, no thrust and no JR needed.
9	90 Elbow	8"	1	S-P2.07	Box Tier	Chorus Restroom	None	None	None		1	1	Pipe found to be solid and well braced. 90 elbow is vertical (turned down) fitting with no thrust load, no JR needed.
13.4	Wye	8"	1	S-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
15	90 Elbow	8"	1	S-P2.09	Box Tier	Mechanical Room	None	None	None		1		Piping found solid and well braced. 90 elbow is a base 90 at bottom of riser and should have JR specified.
15.1	45 Elbow	8"	3	S-P2.09	Box Tier	Mechanical Room	None	None	None			3	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
16	90 Elbow	8"	3	S-P2.09	Box Tier	Studio Theater	None	None	None			3	Pipe found to be solid and well braced to the CMU wall. Not base 90s subjected to thrust loads - no JR needed.
16.1	45 Elbow	8"	1	S-P2.09	Box Tier	Studio Theater	None	None	None			1	Pipe found to be solid and well braced to the CMU wall. Not base fitting subjected to thrust loads - no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
17.2	Wye	8"	1	B-P2.09	Box Tier	Studio Storage	None	None	None			1	Pipe found to be solid and well braced. This wye is a vertical (turned down) fitting with no thrust load, no JR needed.
19	Pipe	8"	1	B-P2.14	Second Tier	Chiller Plant	None	1	None				Adjust Riser Clamp to slab.
19.1	90 Elbow	8"	2	B-P2.14	Second Tier	Chiller Plant	None	None	None			2	Pipe found to be solid and well braced. One 90 elbow is at the top of riser (turned down). Second is a fitting on a well supported horizontal run. These are not subjected to thrust loads, no JR needed.
19.4	Wye	8"	1	B-P2.14	Second Tier	Chiller Plant	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
20	90 Elbow	8"	4	B-P2.14	Second Tier	East Storage	None	None	None			4	This is an OFD that spills on a lower roof. 90 elbows pick-up RD above with short vertical drop from RD and spills onto a lower roof. These are well supported and braced and are not subjected to thrust loads, no JR needed.
22	90 Elbow	8"	1	B-P2.15	Third Tier	West MER	None	None	None			1	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.
22.3	Wye	8"	1	B-P2.15	Third Tier	West MER	None	None	None		1		Piping found solid and well braced. Wye is a 8" diameter wye at the end of a pipe run which may be subjected to thrust load - should have JR specified.
24.1	90 Elbow	8"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Piping found solid and well braced. 90 elbow is horizontal and not subjected to thrust loads - no JR.
24.5	Wye	8"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
25.3	90 Elbow	8"	3	B-P2.16	Third Tier	Mech Duct Space	None	None	None		3		Piping appeared to be solid and well braced. 90 elbows are base 90s at the bottom of risers and should have JRs specified.
25.5	45 Elbow	8"	1	B-P2.16	Third Tier	Mech Duct Space	None	None	None			1	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
25.7	Wye	8"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
30.2	Wye	8"	1	B-P2.18	Intermediate	West MER	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
31.1	Pipe	8"	1	B-P2.18	Intermediate	West MER	None	None	1				Pipe found not sufficiently braced. Install a brace on OFD to column
33	90 Elbow	8"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Piping found solid and well braced tight to structure. 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
33.2	45 Elbow	8"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Pipe found to be solid and well braced tight to structure. 45 elbow is horizontal pipe with no thrust load, no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
33.3	Wye	8"	1	B-P2.18	Intermediate	East Duct Space	None	None	None			1	Pipe found to be solid and well braced tight to structure. Wye is horizontal pipe with no thrust load, no JR needed.
34.1	90 Elbow	8"	2	B-P2.19	Fourth Tier	Main Lobby	None	None	None			2	Pipe appeared to be solid and well supported. Both 90 degree elbows are horizontal and are not subjected to thrust loads - no JR.
34.4	45 Elbow	8"	3	B-P2.19	Fourth Tier	Main Lobby	None	None	None			3	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
34.6	Wye	8"	4	B-P2.19	Fourth Tier	Main Lobby	None	None	None			4	Pipe appeared to be solid and well supported tight to structure. Wyes are horizontal to pick up roof drains and are not subjected to thrust loads - no JR.
35	90 Elbow	8"	3	B-P2.20	Fourth Tier	Above Dimmer & IT East	None	None	None		1	3	Piping found solid and well braced. Two 90 elbows are horizontal and subjected to no thrust loads - no JR. One 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
35.1	45 Elbow	8"	2	B-P2.20	Fourth Tier	Above Dimmer & IT East	None	None	None			2	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
35.2	Wye	8"	1	B-P2.20	Fourth Tier	Above Dimmer & IT East	None	None	None			1	Pipe appeared to be solid and well supported. Wye is horizontal and are not subjected to thrust loads - no JR.
36.2	90 Elbow	8"	4	B-P2.21	Attic	Lower Attic	None	None	None			4	Pipe found to be well supported and braced. These 90 elbows are horizontal and not subjected to thrust loads - no JR.
36.5	45 Elbow	8"	2	B-P2.21	Attic	Lower Attic	None	None	None			2	Pipe found to be well supported and braced. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
36.7	Wye	8"	1	B-P2.21	Attic	Lower Attic	None	None	None			1	Pipe found to be well supported and braced. Wye is horizontal and not subjected to thrust loads - no JR needed.
37.5	45 Elbow	8"	5	B-P2.22	Attic	North Attic Above IT Area	None	None	None			5	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
37.8	Wye	8"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None			2	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
38.1	Pipe	8"	1	B-P2.24	Attic	Upper Attic	1	None	None				Provide hanger at 8" wye for added support.
38.3	90 Elbow	8"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be well supported and braced tight to structure. 90 elbow is horizontal and not subjected to thrust loads - no JR needed.
38.5	45 Elbow	8"	3	B-P2.24	Attic	Upper Attic	None	None	None			3	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
38.7	Wye	8"	4	B-P2.24	Attic	Upper Attic	None	None	None			4	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
1	90 Elbow	10"	2	B-P2.03	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
3	90 Elbow	10"	2	B-P2.03	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
3.1	45 Elbow	10"	2	B-P2.03	Orchestra	Main Lobby	None	None	None			2	Pipe found to be solid and well braced. Horizontal 45 elbow has no load, no thrust and no JR needed.
6	90 Elbow	10"	3	B-P2.05	Orchestra	Loading Dock	None	None	None			3	Was able to confirm a portion of the pipe was solid and well braced. A portion was above loading dock stucco ceiling and could not be seen. The entire pipe run is primarily horizontal and not subjected to thrust loads with no JR needed. Could access elbow near column line HK by cutting in a new AP if needed.
6.1	Wye	10"	1	B-P2.05	Orchestra	Loading Dock	None	None	None			1	Was able to confirm the pipe was solid and well braced. The pipe run is primarily horizontal and not subjected to thrust loads with no JR needed.
8.3	Wye	10"	1	B-P2.07	Box Tier	Donor's Lounge	None	None	None			1	Pipe found to be solid and well braced. Wye fitting is vertical (turned-down) no thrust load, no JR needed.
13	90 Elbow	10"	2	B-P2.09	Box Tier	Mechanical Room	None	None	None		1	1	Piping found solid and well braced. One 90 elbow is a base 90 at bottom of riser and should have JR specified. Second base 90 elbow is top of riser (turned down) and not subjected to thrust load - no JR needed.
13.2	45 Elbow	10"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. 45 elbow is horizontal pipe with no thrust load, no JR needed.
13.3	Wye	10"	1	B-P2.09	Box Tier	Mechanical Room	None	None	None			1	Pipe found to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
24	90 Elbow	10"	1	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			1	Piping found solid and well braced. 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.
24.3	45 Elbow	10"	3	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			3	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.
24.4	Wye	10"	2	B-P2.16	Third Tier	Chiller Plant & CEO	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
34	90 Elbow	10"	2	B-P2.19	Fourth Tier	Main Lobby	None	None	None			2	Pipe appeared to be solid and well braced tight to concrete shear wall. Both 90 degree elbows are horizontal and are not subjected to thrust loads - no JR.
34.3	45 Elbow	10"	4	B-P2.19	Fourth Tier	Main Lobby	None	None	None			4	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
34.5	45 Elbow	10"	4	B-P2.19	Fourth Tier	Main Lobby	None	None	None			4	Pipe appeared to be solid and well supported. Elbows are horizontal and are not subjected to thrust loads - no JR.
34.6	Wye	10"	6	B-P2.19	Fourth Tier	Main Lobby	None	None	None			6	Pipe appeared to be solid and well supported. Wyes are horizontal and are not subjected to thrust loads - no JR.
37	Pipe	10"	1	B-P2.22	Attic	North Attic Above IT Area	None	None	1				Pipe found not to be sufficiently braced. Pipe to be braced to beams/columns.
37.2	90 Elbow	10"	3	B-P2.22	Attic	North Attic Above IT Area	None	None	None		1		Piping appeared to be solid and well braced. 90 elbows are base 90s at the bottom of tall risers and should have JRs specified.
37.4	45 Elbow	10"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None			2	Pipe found to be well supported and braced tight to structure. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
37.7	Wye	10"	1	B-P2.22	Attic	North Attic Above IT Area	None	None	None			1	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
38	Pipe	10"	1	B-P2.24	Attic	Upper Attic	None	None	1				Need sway brace to structure to brace pipe.
38.2	90 Elbow	10"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be solid and well braced. 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
38.7	Wye	10"	1	B-P2.24	Attic	Upper Attic	None	None	None			1	Pipe found to be well supported and braced tight to structure. Wye is horizontal and not subjected to thrust loads - no JR needed.
2	90 Elbow	12"	2	B-P2.03	Orchestra	Main Lobby	None	None	None		1	1	Pipe found to be solid and well braced. Base elbow which may be subjected to thrust loads - JR to be specified. 2nd 90 is at the top of a riser and JR not needed.
7.2	Wye	12"	1	B-P2.07	Box Tier	Restaurant	None	None	None			1	Pipe found to be solid and well braced. Vertical (turned down) wye has no load, no thrust and no JR needed.
21	Pipe	12"	1	B-P2.15	Third Tier	East MER	1	None	None				Support for 12" wye fitting with unistrut.
21.1	90 Elbow	12"	2	B-P2.15	Third Tier	East MER	None	None	None		1	1	Piping found solid and well braced. First 90 elbow is a base 90 at bottom of riser and should have JR specified. Second 90 elbow is at the top of a riser (turned down) and not subjected to thrust loads - no JR.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
21.2	Wye	12"	2	B-P2.15	Third Tier	East MER	None	None	None		X	1	Piping found solid and well braced. First wye is a large diameter 12" to 12" wye at the end of a pipe run which may be subjected to thrust load - should have JR specified. Second wye is a horizontal 6" to 12" wye not subjected to thrust loads - no JR.
25	Pipe	12"	1	B-P2.16	Third Tier	Mech Duct Space	1	None	None				Piping was supported by temporary scaffolding. Agreed to provide additional support under 12" wye.
25.1	NH Coupling	12"	1	B-P2.16	Third Tier	Mech Duct Space	None	None	None	1			Replace existing NH Coupling.
25.2	90 Elbow	12"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None		1	1	Piping found solid and well braced. One 90 elbow already has JR, but must replace the coupling. Second 90 elbow is at the top of a riser (turned down) and not subjected to thrust load - no JR needed.
25.6	Wye	12"	2	B-P2.16	Third Tier	Mech Duct Space	None	None	None			2	Pipe found to be solid and well braced. Wyes are horizontal with no thrust load, no JR needed.
27	90 Elbow	12"		B-P2.17	Intermediate	East Public Restroom	None	None	None				This line was repaired prior to closing GWB ceilings.
28	90 Elbow	12"		B-P2.17	Intermediate	Elev #8 Lobby	None	None	None				This line does not show offset in as-built. Was a straight vertical pipe in the field. No JR needed.
36	Pipe	12"	3	B-P2.21	Attic	Lower Attic	None	None	3				Pipe to be braced to trusses.
36.1	90 Elbow	12"	2	B-P2.21	Attic	Lower Attic	None	None	None			2	One 90 elbow is horizontal and not subjected to thrust loads - no JR. One 90 elbow is at the top of a riser (turned down) - not subjected to thrust loads - no JR.
36.4	45 Elbow	12"	3	B-P2.21	Attic	Lower Attic	None	None	None			3	Pipe found to be well supported and braced. These 45 elbows are horizontal and not subjected to thrust loads - no JR needed.
36.6	Wye	12"	1	B-P2.21	Attic	Lower Attic	None	None	None			1	Pipe found to be well supported and braced. Wye is horizontal and not subjected to thrust loads - no JR needed.
37.1	90 Elbow	12"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None		X		Piping appeared to be solid and well braced. 90 elbows are base 90s at the bottom of tall risers and should have JRs specified.
37.6	Wye	12"	2	B-P2.22	Attic	North Attic Above IT Area	None	None	None		X		Piping appeared to be solid and well braced. Wyes are at the end of long pipe runs and may be subjected to thrust loads. Should have JRs specified.
11	Pipe	15"	1	B-P2.08	Box Tier	Toilet	1	None	None				Pipe not found to be well braced. Will provide bridging hanger above restroom.
11.1	90 Elbow	15"	3	B-P2.08	Box Tier	Chorus & Toilet	None	None	None		1	2	Piping found solid and well braced. One 90 elbow above toilet room should have JR specified. Second base 90 elbow is fixed within CMU shaft wall - no JR needed. Third 90 elbow is top of riser (turned down) without thrust load - no JR needed.
11.3	45 Elbow	15"	2	B-P2.08	Box Tier	Chorus & Toilet	None	None	None			2	Pipe found to be solid and well braced. 45 elbows are horizontal pipe with no thrust load, no JR needed.

PAC Ballet Opera House Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: Z1 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
11.4	Wye	15"	1	S-P2.08	Box Tier	Chorus & Toilet	None	None	None			1	Pipe taint to be solid and well braced. Wye is horizontal with no thrust load, no JR needed.
	TOTALS		258				4	1	8	1	15	219	

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

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**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
1	Additional bracket	4"	1	C-P2.01	Orchestra	Orch Lobby above elect rm	1	None	None				
14.2	Pipe	4"	1	C-P2.06	Box Tier	Women Dressing	None	None	1				4" pipe may need to be braced. Will confirm and install if needed.
2	90 Elbow	6"	2	C-P2.02	Orchestra	Conductors Office	None	None	None		X	1	Pipe found to be solid and well braced. Base elbow should have JR specified. 2nd 90 is at the top of a riser and not subjected to thrust loads.
4	90 Elbow	6"	3	C-P2.02	Orchestra	Soloist Dressing	None	None	None		X	2	Pipe found to be solid and well braced. Base 90 JR difficult but can be done. Other horizontal 90s above ductwork have no thrust loads and no JR needed.
6	22.5 Elbow	6"	2	C-P2.03	Orchestra	Laundry Room	None	None	None			2	Pipe found to be solid and well braced. These are offset fittings on vertical riser. No thrust. Need to relocate laundry furniture to access.
9.1	90 Elbow	6"	1	C-P2.03	Orchestra	Workshop Classroom	None	None	None			1	Pipe found to be solid and well braced. Elbow picks-up RD above. Not a base 90, short vertical drop, no thrust load, no JR needed.
9.2	45 Elbow	6"	2	C-P2.03	Orchestra	Workshop Classroom	None	None	None			2	Horizontal 45 elbow. Pipe found to be solid and well braced. No thrust load, no JR needed.
11	90 Elbow	6"	1	C-P2.05	Box Tier	Choral Assembly	None	None	None			1	Pipe found to be solid and well braced. Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed.
11.1	45 Elbow	6"	2	C-P2.05	Box Tier	Choral Assembly	None	None	None			2	Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed. Pipe found to be solid and well braced.
11.2	Wye	6"	1	C-P2.05	Box Tier	Choral Assembly	None	None	None			1	Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed. Pipe found to be solid and well braced.
14	90 Elbow	6"	2	C-P2.06	Box Tier	Women Dressing	None	None	None			2	Pipe found to be solid and well braced. Fittings are either horizontal or are turning down, i.e. subjected to no thrust load; no JR needed.
14.1	Wye	6"	1	C-P2.06	Box Tier	Women Dressing	None	None	None			1	Fitting is horizontal, i.e. subjected to no thrust load; no JR needed. Pipe found to be solid and well braced.
20	90 Elbow	6"	3	C-P2.11	Third Tier	Lobby & Restroom East	None	None	None		X	2	Pipe found to be solid and well braced. Base 90 elbow under riser - JR to be specified. Horizontal 90 elbow and 90 degree elbow that turns down (top of riser) has no thrust load and no JR needed.
20.1	45 Elbow	6"	5	C-P2.11	Third Tier	Lobby & Restroom East	None	None	None			5	Pipe found to be solid and well braced. Fittings are horizontal, i.e. subjected to no thrust loads; no JR needed.

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Rev: 21 March 2013

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							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
20.2	Wye	6"	1	C-P2.11	Third Tier	Lobby & Restroom East	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load; no JR needed.
21	Wye	6"	1	C-P2.11	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load; no JR needed.
22	90 Elbow	6"	2	C-P2.11	Third Tier	Lobby & Restroom West	None	None	None		X	1	Pipe found to be solid and well braced. Base 90 elbow under riser - JR to be specified. Horizontal 90 elbow in toilet room chase has no thrust load and no JR needed.
22.1	45 Elbow	6"	3	C-P2.11	Third Tier	Lobby & Restroom West	None	None	None			3	Pipe found to be solid and well braced. Fittings are horizontal, i.e. subjected to no thrust loads; no JR needed.
27	90 Elbow	6"	2	C-P2.14	Catwalk	East Chase above Side Circulation	None	None	None		X		Pipe is solid and well braced. Fittings may be subjected to thrust loads from risers above - JR to be specified.
28	90 Elbow	6"	2	C-P2.14	Catwalk	West Chase above Side Circulation	None	None	None		X		Pipe is solid and well braced. Fittings may be subjected to thrust loads from risers above - JR to be specified.
29	90 Elbow	6"	3	C-P2.17	Attic	Attic Level East Side	None	None	None			3	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
30.4	Wye	6"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
31	90 Elbow	6"	4	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			4	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
31.1	45 Elbow	6"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.
31.2	Wye	6"	1	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			1	Pipe found solid and well braced. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.
32	Wye	6"	1	C-P2.18	Attic	Attic Level Southeast MER	None	None	None			1	Pipe found solid and well braced. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.
23.2	45 Elbow	6"	2	C-P2.12	Third Tier	Mechanical Room East	None	None	None			2	Pipe found to be solid and well braced. Fitting is either horizontal or turned down (top of riser) subjected to no thrust load; no JR needed.
29.1	45 Elbow	6"	1	C-P2.17	Attic	Attic Level East Side	None	None	None			1	Pipe found solid and well braced to attic floor slab. Primarily horizontal pipe runs not subjected to thrust loads, no JR needed.

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							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
30.2	45 Elbow	6"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
5.2	Coupling "Rusted"	8"	3	C-P2.02	Orchestra	Production Office	None	None	None	3			Rusted NH Coupling to be replaced
5	90 Elbow	8"	3	C-P2.02	Orchestra	Restroom	None	None	None		X	2	Pipe found to be solid and well braced. Will require access panels. Base 90 should have JR specified. Other 90 degree fittings not subjected to thrust loads and no JR needed.
5	90 Elbow	8"	2	C-P2.02	Orchestra	Production Office	None	None	None		1	1	Pipe found to be solid and well braced. Base 90 difficult but can be done - JR should be specified. Other horizontal 90s above ductwork have no thrust load and no JR needed.
5.1	45 Elbow	8"	2	C-P2.02	Orchestra	Production Office	None	None	None			2	Pipe found to be solid and well braced. Horizontal 45 elbow above ductwork has no load, no thrust and no JR needed.
9	90 Elbow	8"	2	C-P2.03	Orchestra	Workshop Classroom	None	None	None		X	1	One 90 degree fitting to have JR specified. Second 90 elbow is in the chase and partially set into CMU chase wall. Is solid, no movement, no JR needed.
10	90 Elbow	8"	2	C-P2.05	Box Tier	Men's Restroom	None	None	None		X	1	Base elbow to have unistrut to support bottom of elbow as a JR. Pipe found to be solid and well braced. Other 90 elbow turns down (is a top of riser) and has no load, no thrust and no JR necessary.
12	90 Elbow	8"	2	C-P2.05	Box Tier	Corridor	None	None	None		X	1	Pipe found to be solid and well braced. Base elbow to have JR specified. Second 90 elbow is horizontal with no thrust load, no JR needed.
13	90 Elbow	8"	1	C-P2.05	Box Tier	Chase Between Women's & Stair	None	None	None			1	Piping well secured, solid to CMU chase wall between tiled men's and women's toilet. Not a base 90 and no thrust load - No JR needed.
13.1	Wye	8"	1	C-P2.05	Box Tier	Chase Between Women's & Stair	None	None	None			1	Piping well secured, solid to CMU chase wall between tiled men's and women's toilet. No JR needed.
15.2	90 Elbow	8"	1	C-P2.06	Box Tier	Men's Dressing	None	None	None		X		Base elbow at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
15.3	45 Elbow	8"	2	C-P2.06	Box Tier	Men's Dressing	None	None	None		X		Base elbow at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
16	Pipe	8"	1	C-P2.06	Box Tier	Mechanical Room West	None	None	1				Will install sway brace to column.
16.1	90 Elbow	8"	2	C-P2.06	Box Tier	Mechanical Room West	None	None	None		X	1	Base 90 elbow under riser - JR to be specified. Horizontal 90 elbow has no thrust load and no JR needed.
16.2	45 Elbow	8"	2	C-P2.06	Box Tier	Mechanical Room West	None	None	None			2	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust loads, no JR needed.

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Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers
**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
17	90 Elbow	8"	2	C-P2.06	Box Tier	Donor's Lounge	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof above - approx 3'. Not subjected to thrust load, no JR needed. Pipe found to be solid and well braced.
17.1	45 Elbow	8"	1	C-P2.06	Box Tier	Donor's Lounge	None	None	None			1	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'. Not subjected to thrust loads, no JR needed. Pipe found to be solid and well braced.
17.2	Wye	8"	2	C-P2.06	Box Tier	Donor's Lounge	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'. Not subjected to thrust loads, no JR needed. Pipe found to be solid and well braced.
18	90 Elbow	8"	2	C-P2.08	Second Tier	Handicapped Restroom	None	None	None		1	1	Base 90 elbow under riser - JR to be specified. Second 90 elbow turns down (top of riser) has no thrust load and no JR needed. Pipe found to be solid and well braced.
19	90 Elbow	8"	2	C-P2.09	Second Tier	Mechanical Room East	None	None	None		2		Back-to-back base 90 elbows under riser - JR to be specified. Pipe found to be solid and well braced.
19.1	NH Coupling	8"	4	C-P2.09	Second Tier	Mechanical Room East	None	None	None	4			Stripped NH coupling to be replaced.
22.2	Wye	8"	1	C-P2.11	Third Tier	Lobby & Restroom West	None	None	None			1	Pipe found to be solid and well braced. Fitting is a turned-down wye (top of riser) in the toilet chase and subjected to no thrust load; no JR needed.
23	90 Elbow	8"	1	C-P2.12	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
23.1	45 Elbow	8"	1	C-P2.12	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
23.3	Wye	8"	1	C-P2.12	Third Tier	Mechanical Room East	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
24	90 Elbow	8"	4	C-P2.12	Third Tier	Mechanical Room West	None	None	None		3		Pipe is solid and well braced. Fittings may be subjected to thrust loads from risers above - JR to be specified. Access on top of ductwork.
24.1	45 Elbow	8"	1	C-P2.12	Third Tier	Mechanical Room West	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.
24.2	Wye	8"	1	C-P2.12	Third Tier	Mechanical Room West	None	None	None			1	Pipe found to be solid and well braced. Fitting is either horizontal or turned-down (top of riser) subjected to no thrust load; no JR needed.

PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

Rev: 21 March 2013

*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
25.1	90 Elbow	8"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3' drop. Not subjected to thrust loads, no JR needed.
26.1	90 Elbow	8"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
30	90 Elbow	8"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
30.3	Wye	8"	1	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			1	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
33	90 Elbow	8"	6	C-P2.18	Attic	Attic Level Southwest MER	None	None	None		3	3	Pipe appeared to be solid and well braced. Three 90 elbows at bottom of risers may be subjected to thrust loads - JRs to be specified. Three 90 elbows are horizontal or turned-down (top of riser) and not subjected to thrust loads - no JR needed.
33.1	45 Elbow	8"	4	C-P2.18	Attic	Attic Level Southwest MER	None	None	None			4	Piping appeared to be well supported and braced. Fitting not at the bottom of risers with no thrust loads. No JR needed.
33.2	Wye	8"	1	C-P2.18	Attic	Attic Level Southwest MER	None	None	None			1	Piping appeared to be well supported and braced. Fitting not at the bottom of risers with no thrust loads. No JR needed.
26.3	45 Elbow	8"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Pipe found to be solid and well braced. Fitting is horizontal subjected to no thrust load, no JR needed.
30.1	45 Elbow	8"	2	C-P2.17	Attic	Attic Level Smoke Well	None	None	None			2	Pipe appeared to be solid and well braced. Primarily horizontal pipe runs picking up drains from the roof a short distance above - approx 3'-4'. Not subjected to thrust loads, no JR needed.
8	22.5 Elbow	10"	2	C-P2.03	Orchestra	Loading Dock	None	None	None			2	Pipe behind ductwork is solid, vertical offsets, no thrust load, no JR needed.
9.3	Wye	10"	1	C-P2.03	Orchestra	Workshop Classroom	None	None	None			1	Horizontal wye. Pipe found to be solid and well braced. No thrust load, no JR needed.
16.3	Wye	10"	1	C-P2.06	Box Tier	Mechanical Room West	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal, i.e. subjected to no thrust load, no JR needed.

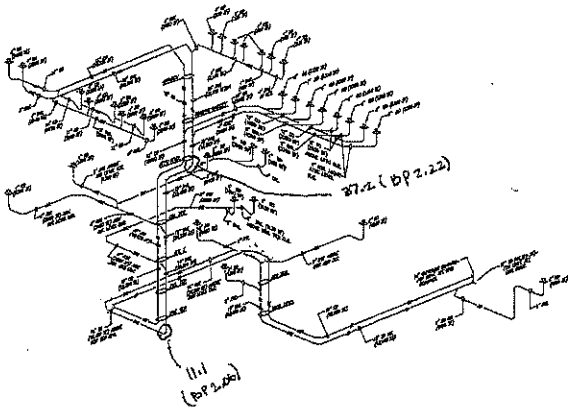
PAC Concert Hall Scope of Work for Sway Bracing, Riser Clamp, Hangers and Joint Restraint on CI Rain Water Leaders (RWL)

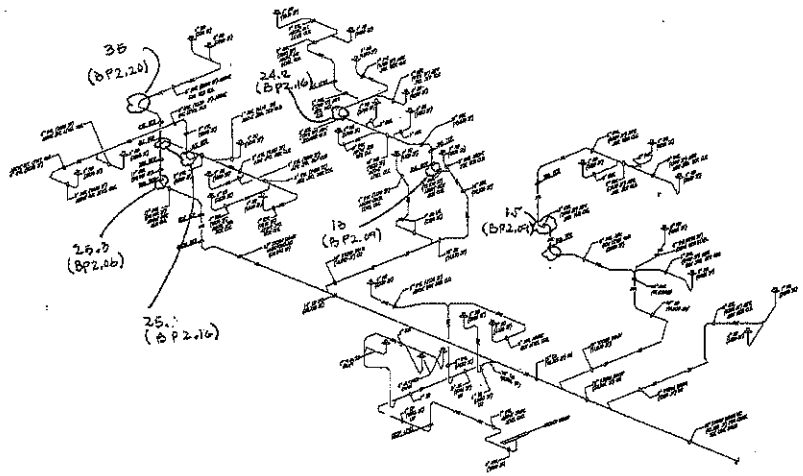
Rev: 21 March 2013

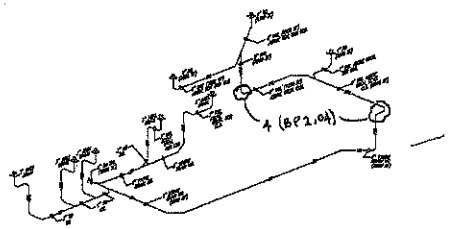
*Type 1 Joint Restraints (JR) - This type of fitting should have joint restraints specified because they may be subjected to a significant thrust load such as 90 degree bends at the bottom of tall risers

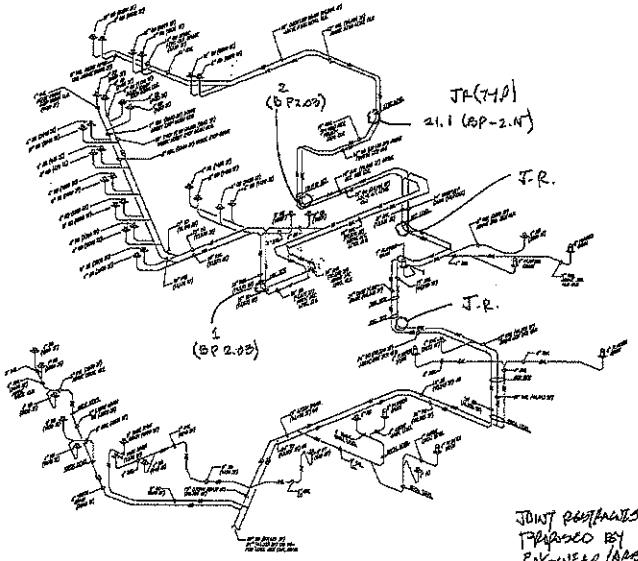
**Type 2 Joint Restraints (JR) - This type of fitting should not have joint restraints specified because they are not subjected to a significant thrust load such as elbows at the top of risers, at horizontal elbows, or elbows at short vertical drops.

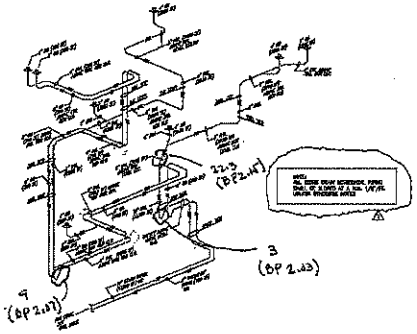
							Jointly Agreed Scope				Fitting Joint Restraints		
Item #	Description	Size	Quantity	Drawing	Level	Location	Hanger / Bracket	Riser Clamp	Sway Brace	Misc Scope	Quantity Type #1 JR *	Quantity Type #2 JR **	Notes
25	90 Elbow	10"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Pipe appeared to be well anchored to the shear wall. 90 elbows at the bottom of approx. 12' riser. Should not be subjected to unresisted thrust loads. Access maybe available from Upper Third Tier slab (New AP). May need further evaluation.
25.2	Wye	10"	1	C-P2.13	Catwalk	Main Lobby	None	None	None			1	Pipe appeared to be solid and well braced. Fitting is a turned-down (top of riser) wye subjected to no thrust load; no JR needed.
1A	90 Elbow	12"	1	C-P2.01	Orchestra	Concrete Shear Wall	None	None	None			1	Pipe appeared to be solid and well braced. 90 base elbow is in encased concrete shear wall.
7	45 Elbow	12"	2	C-P2.03	Orchestra	General Storage	None	None	None			2	Pipe solidly anchored to wall. Vertical 45 offset. No thrust. No JR needed.
15	45 Elbow	12"	1	C-P2.06	Box Tier	Men's Dressing	None	None	None		1		Base elbow at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
15.1	Wye	12"	2	C-P2.06	Box Tier	Men's Dressing	None	None	None		2		Base wye at the bottom of riser. Pipe found to be solid and well braced. JR to be specified.
26	90 Elbow	12"	2	C-P2.13	Catwalk	Main Lobby	None	None	None			2	Pipe found to be solid and well braced. 1 Fitting is a turned-down (top of riser) 90 and the other was a horizontal 90 subjected to no thrust load; no JR needed.
26.2	45 Elbow	12"	3	C-P2.13	Catwalk	Main Lobby	None	None	None			3	Pipe found to be solid and well braced. Fitting is horizontal subjected to no thrust load; no JR needed.
26.4	Wye	12"	1	C-P2.13	Catwalk	Main Lobby	None	None	None			1	Pipe found to be solid and well braced. Fitting is horizontal subjected to no thrust load; no JR needed.
	TOTALS		145				1	0	2	7	3	106	











OVERALL STORM DRAIN RISER N.T.S.

JOINT RESTRAINTS PROVIDED BY ENGINEER/FABRICATOR

05-30-14

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PERFORMING ARTS CENTER OF GREATER MIAMI

FORMER MIAMI BEACH / MAUSOLEUM HOUSE
1300 JUNIPER AVE.
MIAMI, FLORIDA
30 North 1197 North Miami Beach, FL / 30 North Street

Cesar Pelli & Associates Inc
Architects
1056 Chapel Street
New Haven, Connecticut 06510

Whitney Bilenkind and Partners
Associate Architects
1450 S.W. 17th Avenue
Miami, Florida 33145

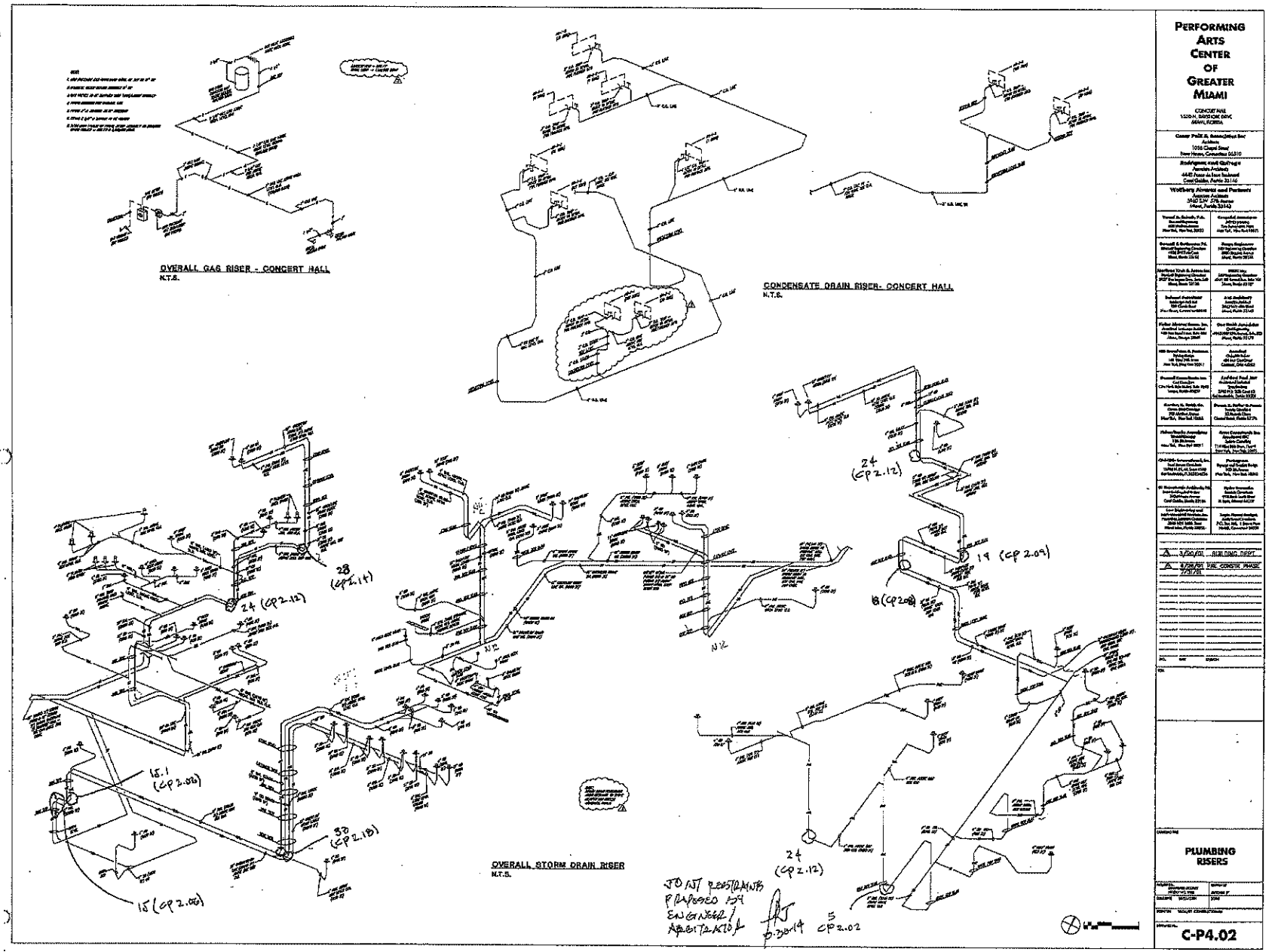
Rodriguez and Quintana
Associate Architects
4440 Ponce de Leon Boulevard
Coral Gables, Florida 33146

Lerner A. Ribeiro, P.E. Structural Engineer 1111 Brickell Avenue, Suite 1550 Miami, Florida 33131	Cerniglia Associates MEP Engineers 440 Biltmore Way Coral Gables, Florida 33134
Russell A. Hutchinson, PE Structural Engineer 1111 Brickell Avenue, Suite 1550 Miami, Florida 33131	Arrigoni Engineers MEP/Fire Protection Consultant 2200 Ponce de Leon Boulevard Miami, Florida 33134
Woodrow Sirois & Associates, Inc. Acoustical Consultant 2727 NW Second Ave., Suite 340 Boca Raton, Florida 33431	DBSC Inc. Audio Technology Consultant 4440 Le Grand Ave., Suite 101 Miami, Florida 33134
Schirmer Associates Theater Consultant 111 Cherry Street New Canaan, Connecticut 06840	Auditorium Acoustics Acoustical Consultant 4440 Le Grand Ave., Suite 101 Miami, Florida 33134
Fisher Dachs Associates, Inc. Theatrical Consultant 230 East 58th Street, Suite 303 New York, New York 10022	Rene Gonzalez Associates Lighting Consultant 4000 NW 4th Street, Suite 103 Miami, Florida 33126
PSM Introduces & Partners Specifications 141 West 28th Street New York, New York 10001	Acoustical Consultant Acoustical Consultant 4000 San Jose Street Concord, California 94520
Howard Cruse Studio, Inc. Graphics Consultant 1 Bridge Street, Suite 1018 Irvington, New York 10533	Auditorium Pond Joint Acoustical Consultant 2 Audubon Place Metairie, Louisiana 70001
Graham G. Smith, Inc. Cost Consultant 30 Vesey Street New York, New York 10007	Bernard A. Gallet & Associates Sound Consultant 30 Vesey Street New York, New York 10007
Global Theatre Associates Theatre Consultant 136 St James New York, New York 10003	Arup Consultants, Inc. Acoustical Consultant 77 West 55th Street, Floor 8 New York, New York 10019
Quantity Surveyors, Inc. Cost Consultant 1 Bridge Street, Suite 1018 Irvington, New York 10533	Transsonics Sound Isolation Design 300 Delaware New York, New York 10019
Ed Mondello Architects, PA Theatre Consultant 200 SW 1st Ave Fort Lauderdale, Florida 33301	Flynn Associates Architectural Consultant 1150 Connecticut Ave N.W. Suite 1000 Washington, D.C. 20036
Lyon Associates, Inc. Theatrical Consultant 1645 Wilshire Blvd Santa Monica, California 90403	Steven Rosen Architect Architectural Consultant P.O. Box 1836, 3 Stone Post Road Sharon, Connecticut 06069

3/20/13	BUILDING DEPT

PLUMBING RISERS

B-P4.02



PERFORMING ARTS CENTER OF GREATER MIAMI

CONCERT HALL
1520 N. BAYSHORE DRIVE
MIAMI, FLORIDA

Owner: Perez Art Museum Miami 1103 Biscayne Boulevard Miami, Florida 33132	Architect: Herzog & de Meuron Rue des Lentillières 29 4009 Basel, Switzerland
Architect: Herzog & de Meuron Rue des Lentillières 29 4009 Basel, Switzerland	Executive Architect: Adamson Associates 3440 S.W. 27th Avenue Miami, Florida 33133
Structural Engineer: Thornton Tomasetti 51 Madison Avenue New York, New York 10010	Civil Engineer: Kimley-Horn and Associates, Inc. 1920 Wekiva Way West Palm Beach, Florida 33411
Mechanical Engineer: Jaffe Holden 114 Washington Street Norwalk, Connecticut 06854	Electrical Engineer: Jaffe Holden 114 Washington Street Norwalk, Connecticut 06854
Plumbing Engineer: Jaffe Holden 114 Washington Street Norwalk, Connecticut 06854	Fire Protection Engineer: Jaffe Holden 114 Washington Street Norwalk, Connecticut 06854
Theatrical Consultant: Fisher Dachs Associates 400 Park Avenue South New York, New York 10016	Acoustical Consultant: Kirkegaard Associates 303 East Wacker Drive Chicago, Illinois 60601
Vertical Transportation: Lerch Bates 2000 Lenox Drive Lawrenceville, New Jersey 08648	Food Service Consultant: Foodmark International 1 Penn Plaza New York, New York 10119
Security Consultant: Ducibella Venter & Santora LLC 2 Penn Plaza East Newark, New Jersey 07105	Audio Visual Consultant: Auerbach Pollock Friedlander 11 Penn Plaza New York, New York 10001
Landscape Architect: Raymond Jungles Inc. 8500 SW 92nd Street Miami, Florida 33156	Lighting Consultant: Fisher Marantz Stone 1 Penn Plaza New York, New York 10119
Civil Engineer: Kimley-Horn and Associates, Inc. 1920 Wekiva Way West Palm Beach, Florida 33411	Geotechnical Engineer: Terracon Consultants, Inc. 8410 NW 53rd Terrace Miami, Florida 33166
Structural Engineer: Arup 77 Water Street New York, New York 10005	Mechanical Engineer: Arup 77 Water Street New York, New York 10005
Electrical Engineer: Arup 77 Water Street New York, New York 10005	Fire Protection Engineer: Arup 77 Water Street New York, New York 10005
Theatrical Consultant: Fisher Dachs Associates 400 Park Avenue South New York, New York 10016	Acoustical Consultant: Kirkegaard Associates 303 East Wacker Drive Chicago, Illinois 60601
Vertical Transportation: Lerch Bates 2000 Lenox Drive Lawrenceville, New Jersey 08648	Food Service Consultant: Foodmark International 1 Penn Plaza New York, New York 10119
Security Consultant: Ducibella Venter & Santora LLC 2 Penn Plaza East Newark, New Jersey 07105	Audio Visual Consultant: Auerbach Pollock Friedlander 11 Penn Plaza New York, New York 10001
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Electrical Engineer: Arup 77 Water Street New York, New York 10005	Fire Protection Engineer: Arup 77 Water Street New York, New York 10005

1	3/20/201 BIDDING SET
2	4/28/201 PRE CONSTR PHASE 7/31/201

NO.	DATE	SKETCH

PLUMBING RISERS

PROJECT NO. 1106	DRAWN BY
DATE 9/20/2013	SCALE

C-P4.02