



State of Rhode Island  
Department of Administration / Division of Purchases  
One Capitol Hill, Providence, Rhode Island 02908-5855  
Tel: (401) 574-8100 Fax: (401) 574-8387

**ADDENDUM # 1**

12/7/16

Solicitation #7551144

*Title: Replacement of Existing Cooling Tower – CCRI Newport Campus*

**Submission Deadline: December 19, 2016 @ 2:00 pm (ET)**

Per the issuance of ADDENDUM #1 the following are noted:

Addendum 1 (See Attached)  
**Questions and Responses**  
**Related Documents**  
**Pre-Bid Attendance Sheet**

*Interested Parties should monitor this website on a regular basis, for any additional information that may be posted.*

**Gary P. Mosca**  
**Chief Buyer**

Addendum No. 1  
12/06/2016  
7551144 Cooling Tower Replacement – CCRI Newport Campus

1. Question 1: The bid form asks for an Alternate No. 1 that isn't described in the specs nor shown on the drawings and Sect. 011000 Summary of Work states par. 1.2, page 2 that there are no alternates; please clarify.

F&O Response: Refer to Specification section 23 65 00, par. 1.3A "Substitutions" for requirements.

2. Question 2: Will a water treatment system and/or chemicals be required or is there an existing system that will remain? Will a glycol solution be required?

F&O Response: There is an existing chemical water treatment system that shall remain and is connected to existing to remain piping. A glycol solution is not required.

3. Question 3: Per Sect. 236500, par. 2.1A, page 3, it appears that Delta Cooling Towers is the proprietary cooling tower vendor, are we correct?

F&O Response: The Delta cooling tower was used as the basis of design to meet CCRI's project requirements for a non-corroding tower that fits in the available space with the necessary clearances. Specification section 23 65 00, par. 1.3A "Substitutions", describes how the Contractor may propose and submit substitutions for review.

4. Question 4: Drawings MD-101, M-101 & M-501 are confusing on piping removal & new pipe installation. Is it safe to say that this work begins at the outside face of the wall?

F&O Response: Use drawing M-101 to identify the beginning of new piping scope of work. Adjust demolition of existing piping shown on MD-101, and the new piping shown on M-501, to the locations shown on M-101. Note that on drawings MD-101, M-101, and M-501, new piping has a darker thicker lineweight than existing piping.

5. Question 5: Vibration isolator mounts are shown on detail 2/S-101 & mentioned in the cooling tower installation Sect. 236500, par. 3.2B, page 7, but there is no Section 230548 as mentioned and they are not specified to be furnished with the cooling tower. Please verify that they are required and if so, provide quantities and model numbers. Will seismic calculations have to be provided?

F&O Response: Yes, vibration isolation for the cooling tower shall be required. Yes, seismic calculations that define the need and type of restraint shall be provided by the seismic restraint equipment supplier. See also the attached specification section 23 05 48.

6. Question 6: We did not look at the ductwork insulation during the pre-bid walk-thru this morning that has to be removed & replaced as shown on M-102. Provide contact information at the campus to make arrangements to look at this.

F&O Response: Mark Libutti 401-825-2380

7. Question 7: Will ductwork insulation mockups be required per Sect. 230713, par. 1.4C, pages 1-2?

F&O Response: Yes, an insulation mockup shall be required for review by the Engineer and Owner before the reinsulation part of the project begins.

8. Question 8: Five (5) year warranty by the contractor on the entire tower per Sect. 236500, par. 1.8B, page 3, far exceeds the normal one (1) year warranty after acceptance and is not covered by the manufacturer's warranty, we request that this is reduced to one (1) year by the contractor.

F&O Response: THE COLLEGE REQUIRES AN EXTENDED WARRANTEE BE PROVIDED.

9. Question 9: The drawing shows we (REYMSA) can meet the footprint of the Delta Tower.

F&O Response: Please refer to response to Question 3.

10. Question 10: I represent REYMSA Seamless Fiberglass Cooling Towers who is competitive with Delta Cooling Towers, but REYMSA is a better construction and performs better than Delta. You or the Architect can have the REYMSA Tower painted any color you want. We have REYMSA Towers at National Grid in RI and Mass Bay CC in MA. I have also attached a brochure for your review.

F&O Response: Please refer to response to Question 3.

## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SCOPE OF WORK

- A. All new and disturbed fuel piping (natural gas, propane, fuel oil) shall have seismic restraints.
- B. Cooling tower shall receive seismically restrained spring vibration isolators with a 1" minimum deflection. Provide the number, type, size, and distribution of spring isolators as required by the cooling tower manufacturer.

### 1.3 DESCRIPTION

- A. Intent

1. All mechanical equipment, piping and ductwork as noted on the equipment schedule or in this Specification shall be mounted on vibration isolators to prevent the transmission of vibration and mechanically transmitted sound to the building structure. Vibration isolators shall be selected in accordance with the weight distribution so as to produce reasonably uniform deflections.
2. All isolators and isolation materials shall be of the same manufacturer and shall be certified by the manufacturer.
3. It is the intent of the seismic portion of this Specification to keep all mechanical building system components in place during a seismic event.
4. All such systems must be installed in strict accordance with seismic codes, component manufacturer and building construction standards. Whenever a conflict occurs between the manufacturer or construction standards, the most stringent shall apply.
5. This Specification is considered to be minimum requirements for seismic consideration and is not intended as a substitute for legislated, more stringent, national, state or local construction requirements (such as California Title 24, California OSHPD, Canadian Building Codes, or other requirements).
6. Any variance or non-compliance with these Specification requirements shall be corrected by the Contractor in an approved manner.
7. Seismic restraints shall be designed in accordance with seismic force levels as detailed in the state's commercial Building Code and the American Society of Civil Engineer's Standard for "Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7)" also known as ASCE 7.

- B. The work in this section includes, but is not limited to the following:

1. Vibration isolation for piping, ductwork and equipment.
2. Equipment isolation bases.
3. Flexible piping connections.
4. Seismic restraints for isolated equipment.
5. Seismic restraints for non-isolated equipment.
6. Certification of seismic restraint designs and installation supervision.
7. Certification of seismic attachment of housekeeping pads.
8. All mechanical systems. Equipment buried underground is excluded but entry of services through the foundation wall is included. Equipment referred to below is typical. (Equipment not listed is still included in this Specification)

AC Units	Comp Room Units	Pumps
Air Distribution Boxes	Condensers	Rooftop Units
Air Handling Units	Condensing Units	Tanks (All types)
Air Separators	Cooling Towers	Unit Heaters
Boilers	Ductwork	Variable Frequency Drives
Cabinet Heaters	Fans	Water Heaters
Chillers	Heat Exchangers	
Compressors	Piping	

C. Definitions

1. Life Safety Systems: All systems involved with fire protection including sprinkler piping, fire pumps, jockey pumps, fire pump control panels, service water supply piping, water tanks, fire dampers and smoke exhaust systems.
  - a. All medical and life support systems.
  - b. Fresh air relief systems on emergency control sequence including air handlers, conduit, duct, dampers, etc.
2. Positive Attachment: A cast-in anchor, a drill-in wedge anchor, a double sided beam clamp loaded perpendicular to a beam, or a welded or bolted connection to structure. Single sided "C" type beam clamps for support rods of overhead piping, ductwork, fire protection, or any other equipment are not acceptable on this Project as seismic anchor points.
3. Transverse Bracing: Restraint(s) applied to limit motion perpendicular to the centerline of the pipe or duct.
4. Longitudinal Bracing: Restraint(s) applied to limit motion parallel to the centerline of the pipe, or duct.

1.4 SUBMITTAL

- A. The manufacturer of vibration isolation and seismic restraints shall provide submittals for products as follows:

1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Descriptive Data:
  - a. Catalog cuts or data sheets on vibration isolators and specific restraints detailing compliance with the Specification.
  - b. Detailed schedules of flexible and rigidly mounted equipment, showing vibration isolators and seismic restraints by referencing numbered descriptive Drawings.
3. Shop Drawings:
  - a. Submit fabrication details for equipment bases including dimensions, structural member sizes and support point locations.
  - b. Provide all details of suspension and support for ceiling hung equipment.
  - c. Where walls, floors, slabs or supplementary steel work are used for seismic restraint locations, details of acceptable attachment methods for ducts, and pipe must be included and approved before the condition is accepted for installation. Restraint manufacturers' submittals must include spacing, static loads and seismic loads at all attachment and support points.
  - d. Provide specific details of seismic restraints and anchors; include number, size and locations for each piece of equipment.
  - e. Submittals for all directional seismic snubbers shall include the load deflection curves up to 1/2" deflection in the x, y and z planes.
4. Delegated-Design Submittal: For each vibration isolation and seismic-restraint device.
  - a. Include design calculations and details for selecting vibration isolators, seismic restraints, and vibration isolation bases complying with performance requirements, design criteria, and analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - b. Design Calculations: Calculate static and dynamic loading due to equipment weight, operation, and seismic and wind forces required to select vibration isolators and seismic and wind restraints and for designing vibration isolation bases.
    - 1) Coordinate design calculations with wind load calculations required for equipment mounted outdoors. Comply with requirements in other Sections for equipment mounted outdoors.
5. Seismic Certification and Analysis:
  - a. Seismic restraint calculations must be provided for all connections of equipment to the structure. Calculations must be stamped by a registered professional engineer with at least five years of seismic design experience, licensed in the state of the job location.
  - b. All restraining devices shall have a preapproval number from California OSHPD or some other recognized government agency showing maximum restraint ratings. Preapprovals based on independent testing are preferred to preapprovals based on calculations. Where preapproved devices are not available, submittals based on

independent testing are preferred. Calculations (including the combining of tensile and shear loadings) to support seismic restraint designs must be stamped by a registered professional engineer with at least five years of seismic design experience and licensed in the state of the job location. Testing and calculations must include both shear and tensile loads, as well as, one test or analysis at 45 degrees to the weakest mode.

- c. Analysis must indicate calculated dead loads, static seismic loads and capacity of materials utilized for connections to equipment and structure. Analysis must detail anchoring methods, bolt diameter, embedment and/or welded length. All seismic restraint devices shall be designed to accept, without failure, the forces detailed in the state's commercial Building Code and ASCE 7 acting through the equipment center of gravity. Overturning moments may exceed forces at ground level.

## 1.5 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for HVAC piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
- C. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
- D. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- E. Design seismic-restraint hangers and supports for piping and equipment..

## 1.6 CODE AND STANDARDS REQUIREMENTS

- A. Typical Applicable codes and Standards
  - 1. International Building Code (IBC)
  - 2. ASCE/SEI 7
  - 3. State Building Code with ammendments and modifications

## 1.7 MANUFACTURER'S RESPONSIBILITY

- A. Manufacturer of vibration isolation and seismic control equipment shall have the following responsibilities:
  - 1. Determine vibration isolation and seismic restraint sizes and locations.
  - 2. Provide vibration isolation and seismic restraints as scheduled or specified.

3. Provide calculations and materials if required for restraint of unisolated equipment.
4. Provide installation instructions, Drawings and trained field supervision to insure proper installation and performance.
5. Provide field survey of the installation and submit letter to Engineer stating that the seismic and vibration isolation equipment has been installed in accordance with the manufacturer's instructions.

## 1.8 RELATED WORK

### A. Housekeeping Pads

1. Housekeeping pad reinforcement and monolithic pad attachment to the structure details and design shall be prepared by the restraint vendor if not already indicated on the Drawings.
2. Housekeeping pads shall be coordinated with restraint vendor and sized to provide a minimum edge distance of ten (10) bolt diameters all around the outermost anchor bolt to allow development of full drill-in wedge anchor ratings. If cast-in anchors are to be used, the housekeeping pads shall be sized to accommodate the ACI requirements for bolt coverage and embedment.

### B. Supplementary Support Steel

1. Contractor shall supply supplementary support steel for all equipment, piping, ductwork, etc. including roof mounted equipment, as required or specified.

### C. Attachments

1. Contractor shall supply restraint attachment plates cast into housekeeping pads, concrete inserts, double sided beam clamps, etc., in accordance with the requirements of the vibration vendor's calculations.

## 1.9 SEISMIC FORCE LEVELS

- A. Seismic analysis shall be in accordance with the state's building code and the latest version of International Building Code, whichever is more conservative.

## PART 2 - PRODUCTS

### 2.1 INTENT

- A. All vibration isolators and seismic restraints described in this Section shall be the product of a single manufacturer. Mason Industry's products are the basis of these Specifications; products of other manufacturers are acceptable provided their systems strictly comply with the Specification and have the approval of the Engineer. Submittals and certification sheets shall be in accordance with Part 1.4 of this Specification.



- B. For the purposes of this Project, failure is defined as the discontinuance of any attachment point between equipment or structure, vertical permanent deformation greater than 1/8 inch and/or horizontal permanent deformation greater than 1/4 inch.

## 2.2 PRODUCT DESCRIPTIONS

### A. Vibration Isolator and Seismic Restraint Types

The numbers of the following paragraphs correlate to the graphic representations at the end of this Article.

1. Two layers of 3/4-inch thick neoprene pad consisting of 2-inch square waffle modules separated horizontally by a 16 gage galvanized shim. Load distribution plates shall be used as required. Pads shall be Type Super "W" as manufactured by Mason Industries, Inc.
2. Not Used
3. Sheet metal panels shall be bolted to the walls or supporting structure by assemblies consisting of a neoprene bushing cushioned between 2 steel sleeves. The outer sleeve prevents the sheet metal from cutting into the neoprene. Enlarge panel holes as required. Neoprene elements pass over the bushing to cushion the back panel horizontally. A steel disc covers the inside neoprene element and the inner steel sleeve is elongated to act as a stop so tightening the anchor bolts does not interfere with panel isolation in 3 planes. Bushing assemblies can be applied to the ends of steel cross members where applicable. All neoprene shall be bridge-bearing quality. Bushing assemblies shall be type PB as manufactured by Mason Industries, Inc.
4. A one piece molded bridge bearing neoprene washer/bushing. The bushing shall surround the anchor bolt and have a flat washer face to avoid metal-to-metal contact. Neoprene bushings shall be type HG as manufactured by Mason Industries, Inc.
5. Not Used
6. SLR Type Restrained Spring Mount
7. SSLFH Type Housed Spring Mount
8. Not Used
9. Not Used
10. Hangers shall consist of rigid steel frames containing minimum 1-¼ inch thick neoprene elements at the top and a steel spring with general characteristics as in Type 5 seated in a steel washer reinforced neoprene cup on the bottom. The neoprene element and the cup shall have neoprene bushings projecting through the steel box. To maintain stability the boxes shall not be articulated as clevis hangers nor the neoprene element stacked on top of the spring. Spring diameters and hanger box lower hole sizes shall be large enough to permit the hanger rod to swing through a 30 degree arc from side to side before contacting the rod bushing and short circuiting the spring. Submittals shall include a hanger Drawing showing the 30 degree capability. Hangers shall be type 30N as manufactured by Mason Industries, Inc.
11. Precompressed hangers shall be as specified in Paragraph 2.3 A.10., but they shall also be locked at the rated deflection by means of a resilient seismic upstop to keep the piping or equipment at a fixed elevation during installation. The hangers shall be designed with a release mechanism to free the spring after the installation is complete and the hanger is subjected to its full load. Deflection shall be clearly indicated by means of a scale. Submittals shall include a Drawing of the hanger showing the 30 degree capability. Hangers shall be type PC30N as manufactured by Mason Industries, Inc.

Types 12 - 14 apply to trapeze as well as clevis hanger locations. At trapeze anchor locations piping must be shackled to the trapeze. Types apply to hanging equipment as well.

12. Seismic Cable Restraints shall consist of galvanized steel aircraft cables sized to resist seismic loads with a minimum safety factor of 2 and arranged to provide all-directional restraint. Cable end connections shall be steel assemblies that swivel to final installation angle and utilize two clamping bolts to provide proper cable engagement. Cables must not be allowed to bend across sharp edges. Cable assemblies shall have an anchorage preapproval "R" number from OSHPD in the state of California verifying the maximum certified load ratings. Cable assemblies shall be Type SCB at the ceiling and at the clevis bolt, SCBH between the hanger rod nut and the clevis, or SCBV if clamped to a beam all as manufactured by Mason Industries, Inc.
13. Seismic solid braces shall consist of steel angles or channels to resist seismic loads with a minimum safety factor of 2 and arranged to provide all directional restraint. Seismic solid brace end connectors shall be steel assemblies that swivel to the final installation angle and utilize two through bolts to provide proper attachment. Seismic solid brace assembly shall have anchorage preapproval "R" number from OSHPD in the state of California verifying the maximum certified load ratings. Solid seismic brace assemblies shall be type SSB as manufactured by Mason Industries, Inc.
14. Steel angles, sized to prevent buckling, shall be clamped to pipe or equipment rods utilizing a minimum of three ductile iron clamps at each restraint location when required. Welding of support rods is not acceptable. Rod clamp assemblies shall have an anchorage preapproval "R" number from OSHPD in the state of California. Rod clamp assemblies shall be Type SRC as manufactured by Mason Industries, Inc.
15. Pipe clevis cross bolt braces are required in all restraint locations. They shall be special purpose preformed channels deep enough to be held in place by bolts passing over the cross bolt. Clevis cross braces shall have an anchorage preapproval "R" number from OSHPD in the State of California. Clevis cross brace shall be type CCB as manufactured by Mason Industries, Inc.
16. All-directional seismic snubbers shall consist of interlocking steel members restrained by a one-piece molded neoprene bushing of bridge bearing neoprene. Bushing shall be replaceable and a minimum of 1/4 inch thick. Rated loadings shall not exceed 1000 psi. A minimum air gap of 1/8 inch shall be incorporated in the snubber design in all directions before contact is made between the rigid and resilient surfaces. Snubber end caps shall be removable to allow inspection of internal clearances. Neoprene bushings shall be rotated to insure no short circuits exist before systems are activated. Snubbers shall have an anchorage preapproval "R" number from OSHPD in the State of California verifying the maximum certified horizontal and vertical load ratings. Snubber shall be Type Z-1225 as manufactured by Mason Industries, Inc.
17. Not Used
18. Stud wedge anchors shall be manufactured from full diameter wire, not from undersized wire that is "rolled up" to create the thread. The stud anchor shall also have a safety shoulder which fully supports the wedge ring under load. The stud anchors shall have an evaluation report number from the I.C.B.O Evaluation Service, Inc. verifying its allowable loads. Drill-in stud wedge anchors shall be type SAS as manufactured by Mason Industries, Inc.
19. Female wedge anchors are preferred in floor locations so isolators or equipment can be slid into place after the anchors are installed. Anchors shall be manufactured from full diameter

wire, and shall have a safety shoulder to fully support the wedge ring under load. Female wedge anchors shall have an evaluation report number from the I.C.B.O Evaluation Service, Inc. verifying to its allowable loads. Drill-in female wedge anchors shall be type SAB as manufactured by Mason Industries, Inc.

20. Not Used

21. Not Used

22. Not Used

23. Not Used

24. Flexible stainless steel hose shall have stainless steel braid and carbon steel fittings. Sizes 3 inches and larger shall be flanged. Smaller sizes shall have male nipples. Minimum lengths shall be as tabulated:

a. Flanged Male Nipples

3 x 14	10 x 26	1/2 x 9	1-1/2 x 13
4 x 15	12 x 28	3/4 x 10	2 x 14
5 x 19	14 x 30	1 x 11	2-1/2 x 18
6 x 20	16 x 32	1-1/4 x 12	8 x 22

b. Hoses shall be installed on the equipment side of the shut-off valves horizontally and parallel to the equipment shafts wherever possible. Hoses shall be type BSS as manufactured by Mason Industries, Inc.

25. Not Used

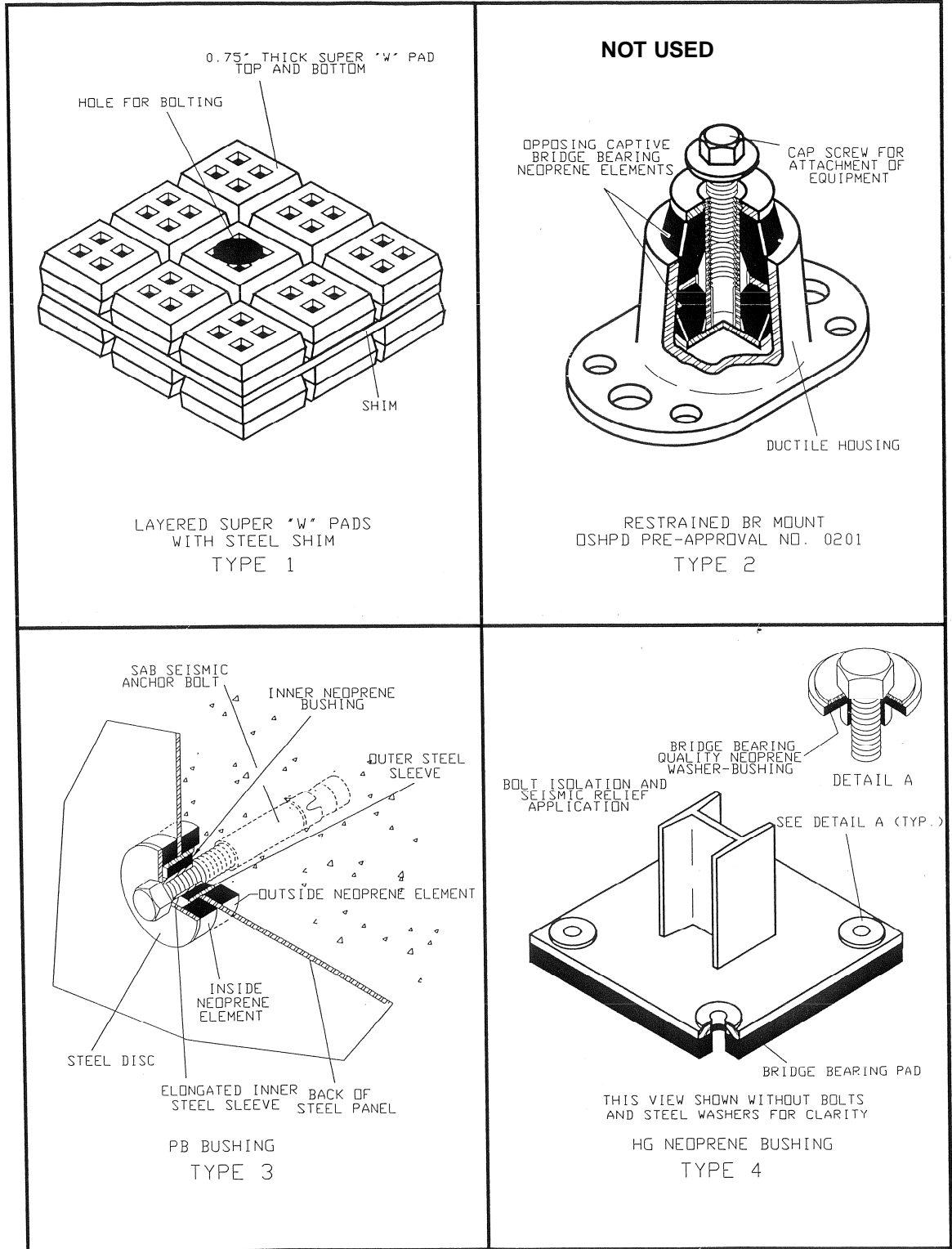
26. Not Used

27. Not Used

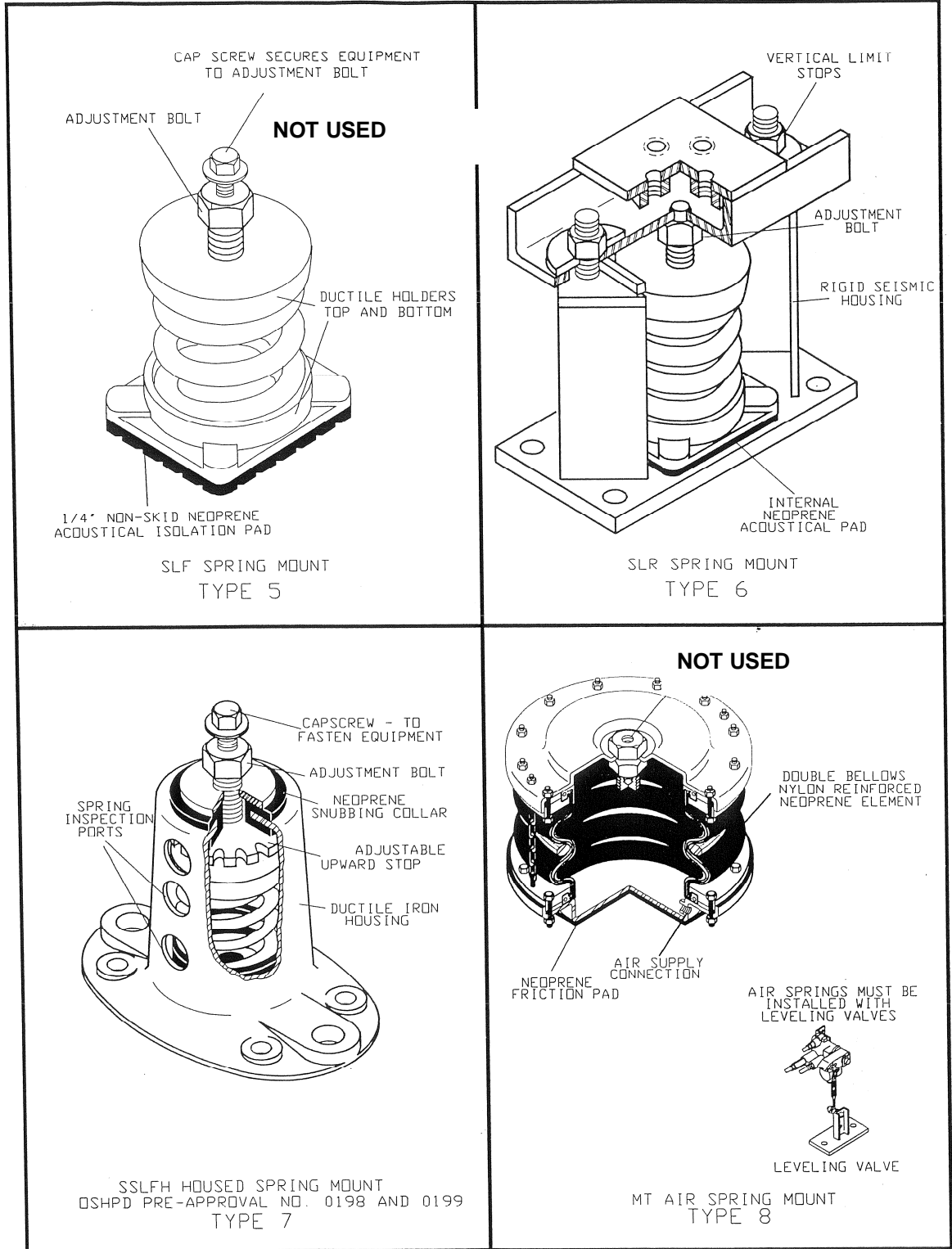
28. Not Used

29. Housekeeping pad anchors shall consist of a ductile iron casting that is tapered and hexagonal, smaller at its base than its top. The upper portion shall have holes for rebar to pass through. The anchor shall be continuously threaded from top to bottom for the attachment of soleplates. Housekeeping pad anchors shall be attached to the structural slab using a stud wedge anchor. Housekeeping pad anchors shall be type HPA and stud wedge anchor shall be type SAS both as manufactured by Mason Industries, Inc.

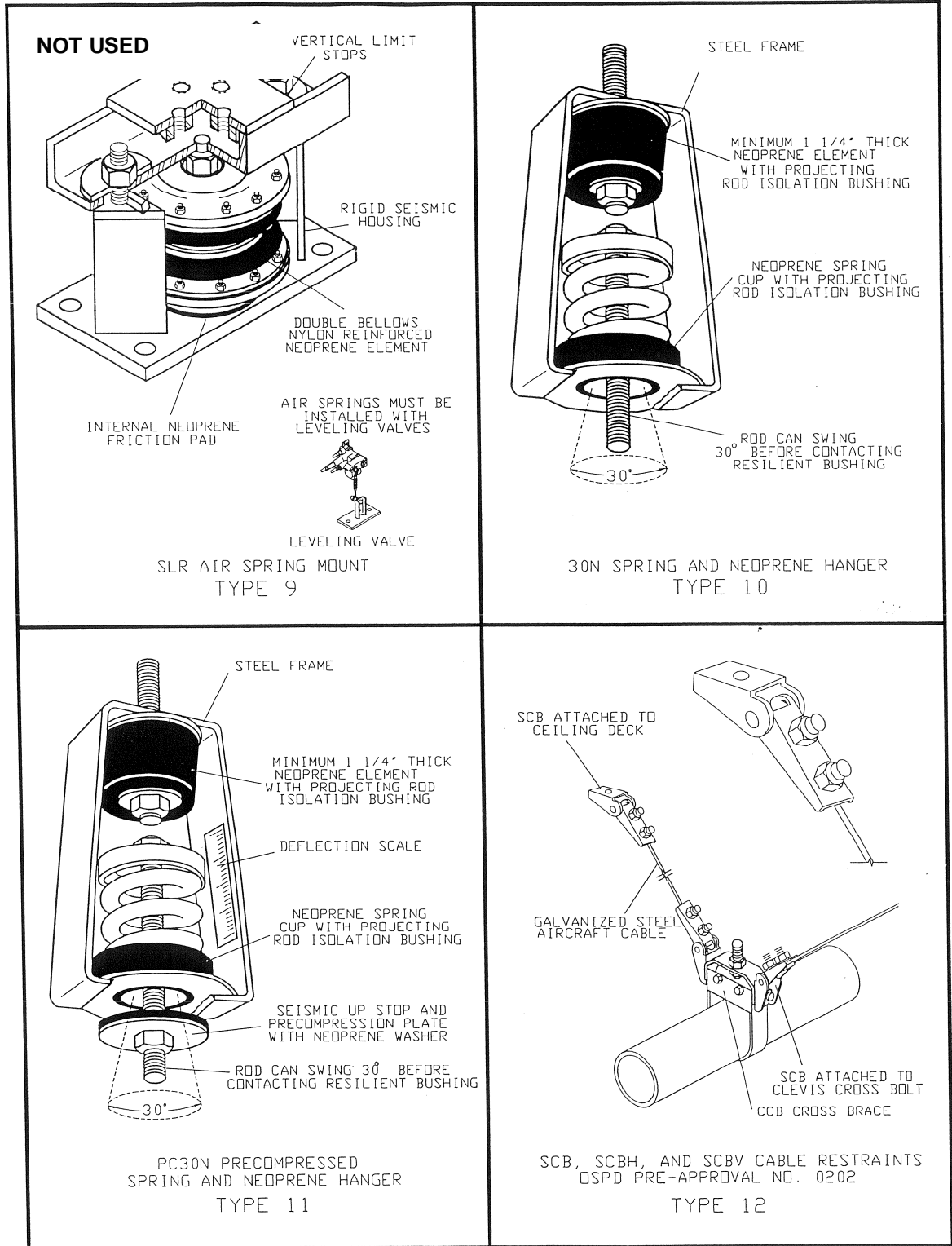
VIBRATION ISOLATION AND SEISMIC RESTRAINT TYPES



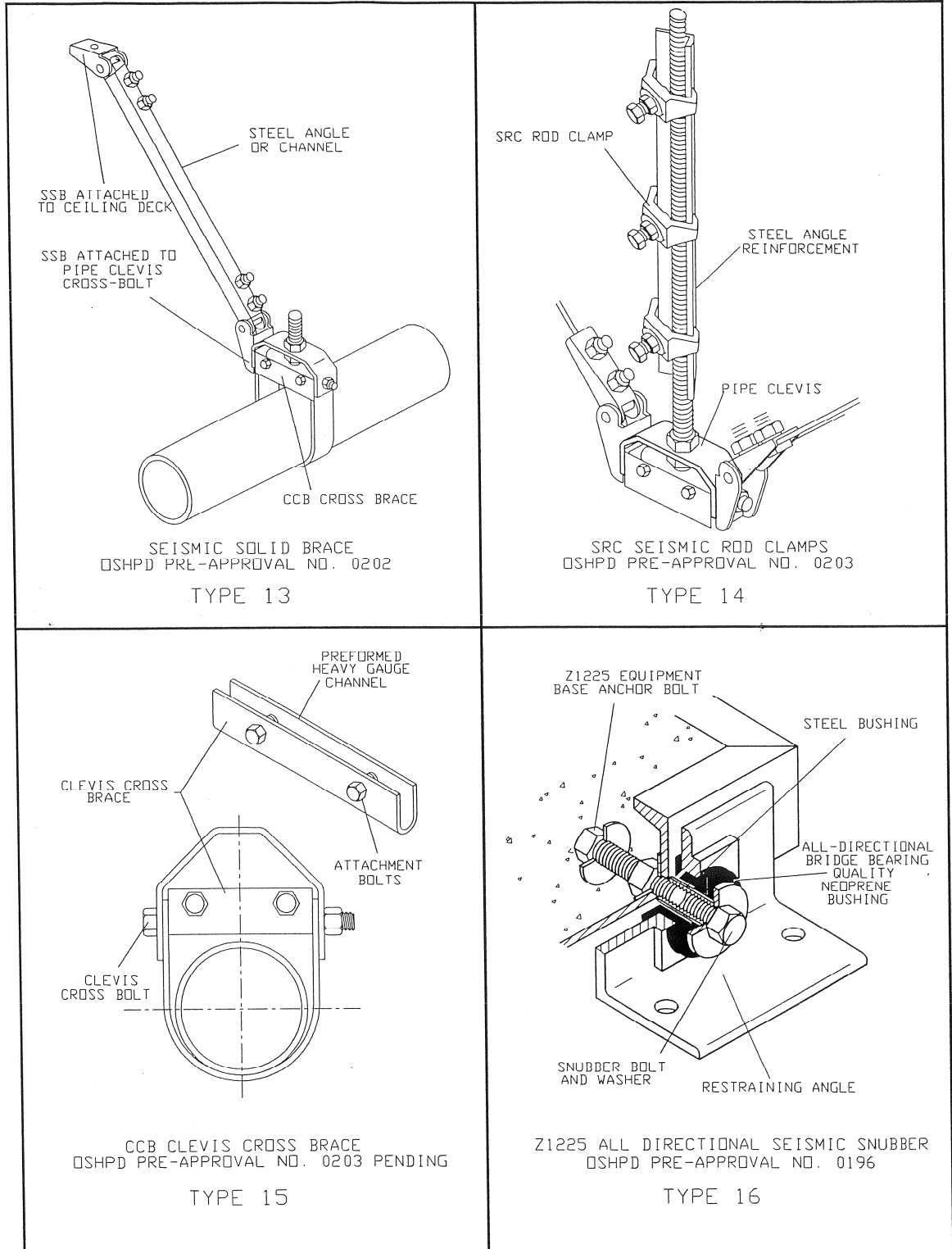
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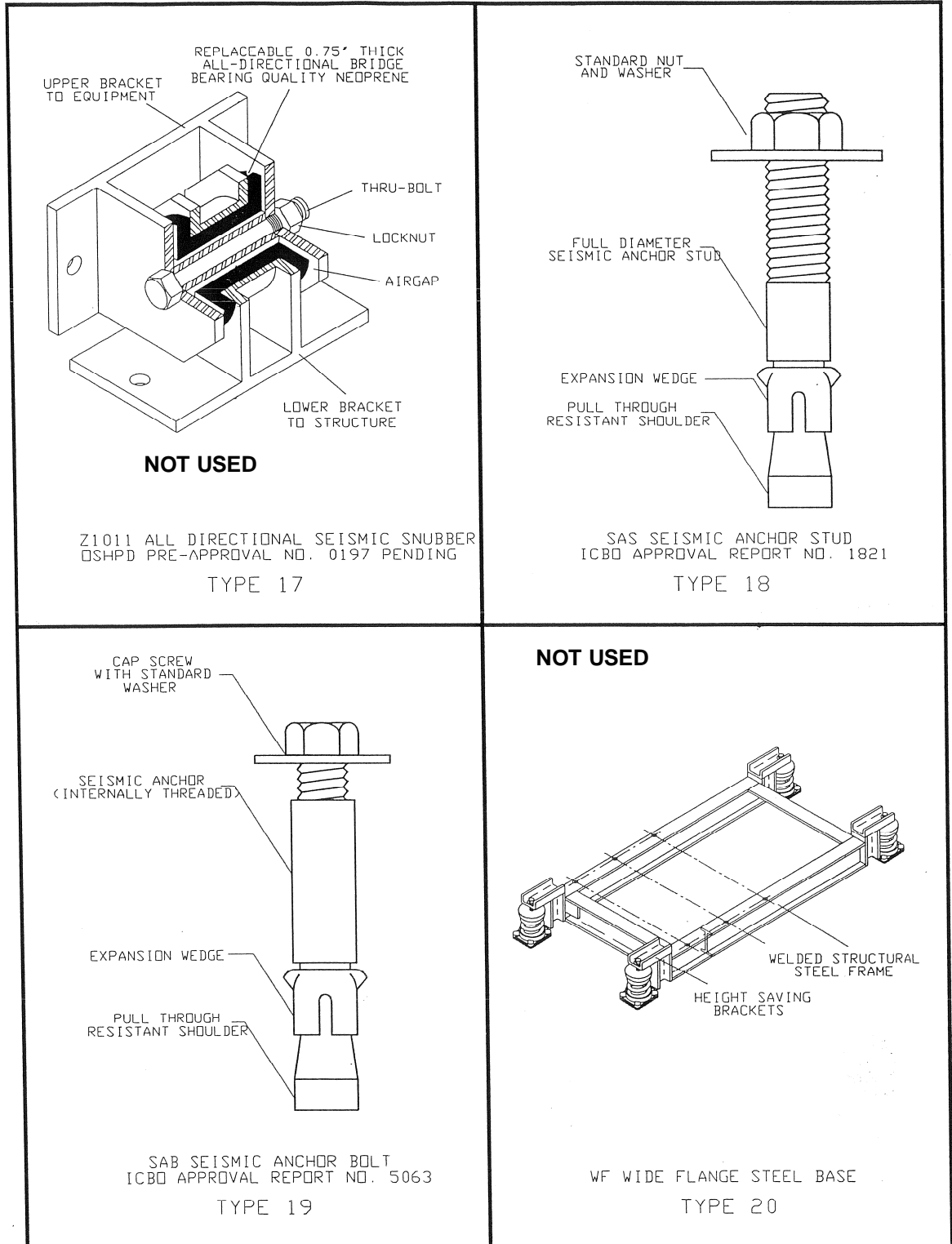
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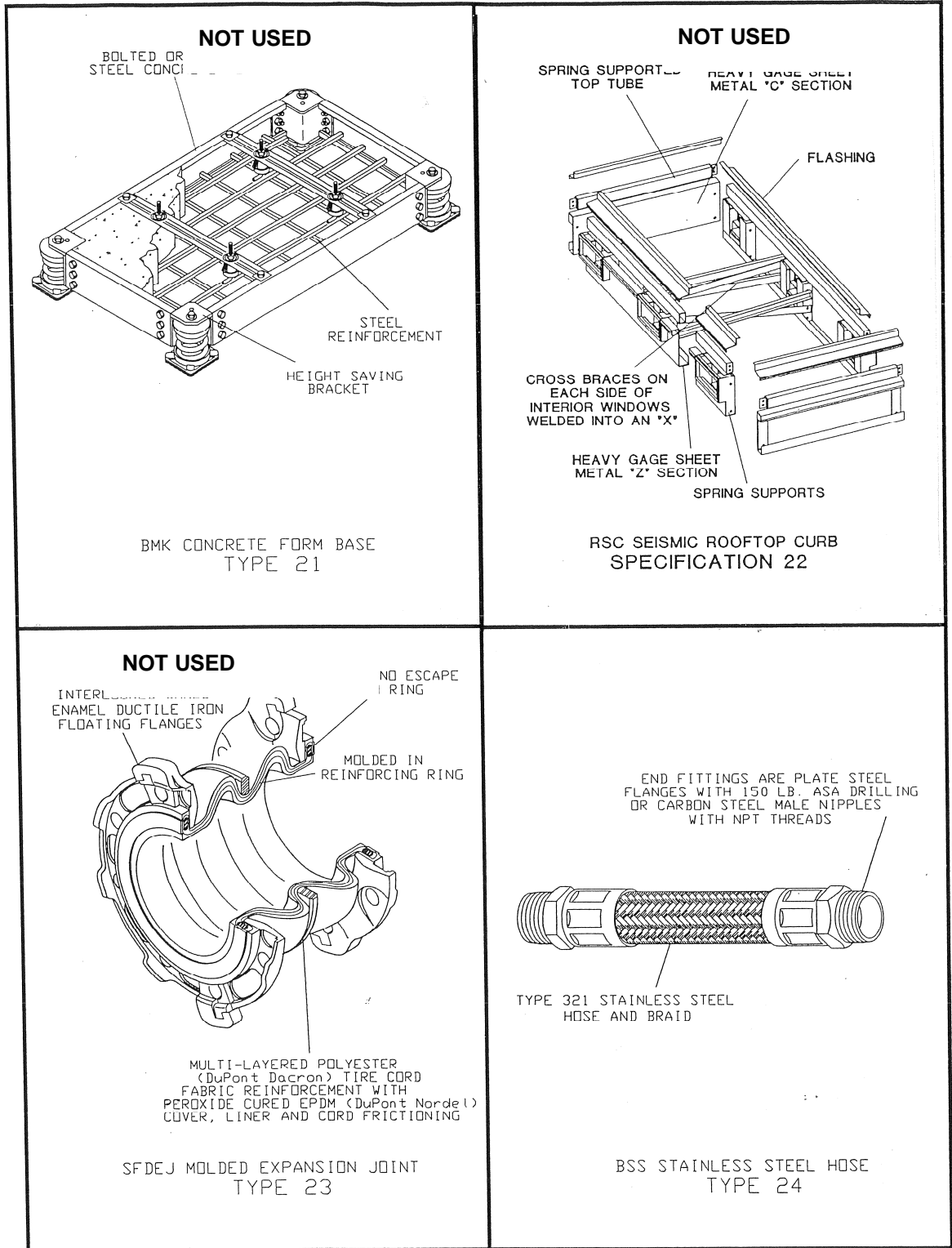


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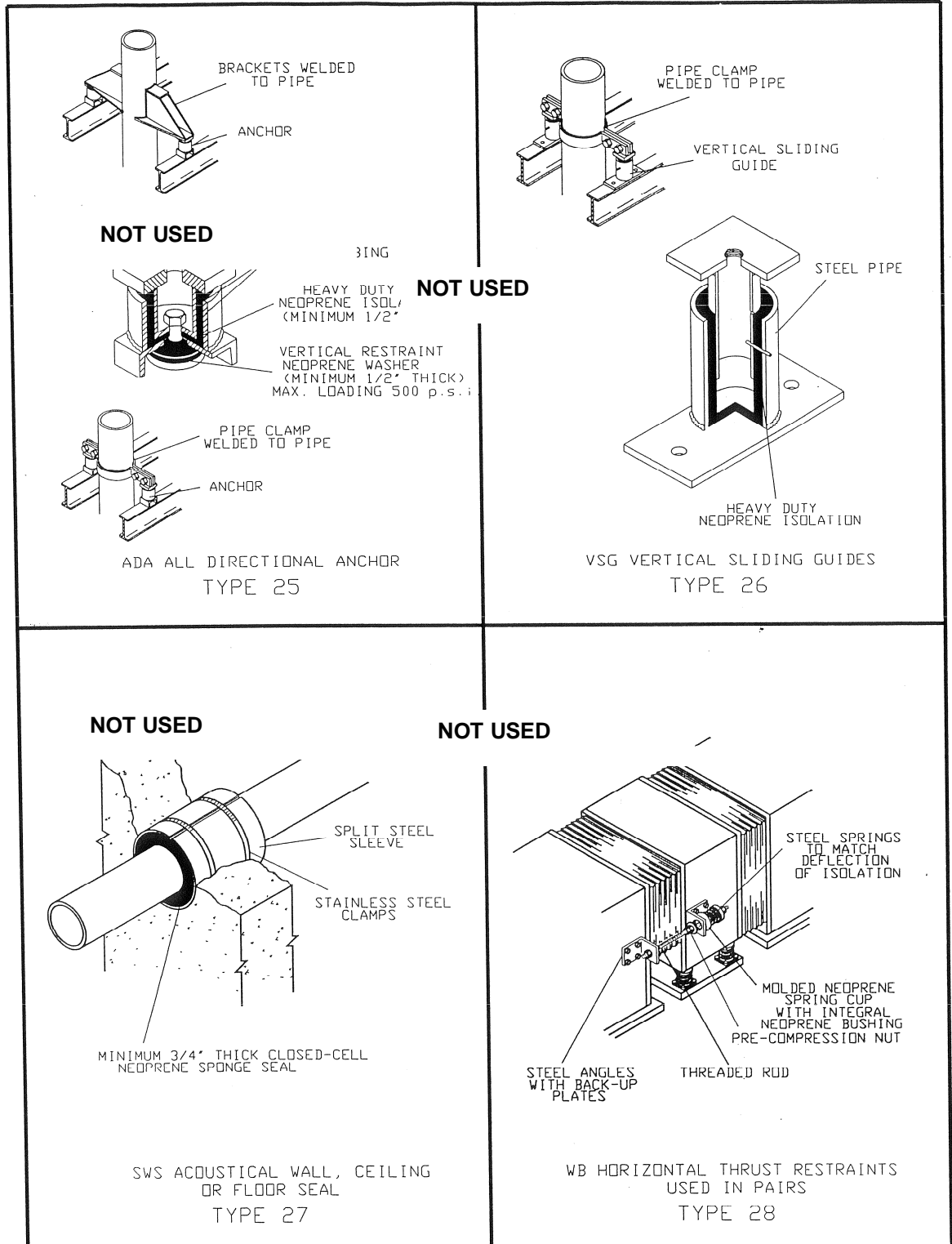




VIBRATION ISOLATION AND SEISMIC RESTRAINT TYPES



VIBRATION ISOLATION AND SEISMIC RESTRAINT TYPES



PART 3 -

VIBRATION AND SEISMIC RESTRAINT FOR HVAC EQUIPMENT

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### PART 3 - EXECUTION

#### 3.1 GENERAL

- A. All vibration isolators and seismic restraint systems shall be installed in strict accordance with the manufacturer's written instructions and all certified submittal data.
- B. Installation of vibration isolators and seismic restraints shall not cause any change in position of equipment, piping or ductwork resulting in stresses or misalignment.
- C. No rigid connections between equipment and the building structure shall be made that degrades the noise and vibration control system herein specified.
- D. The Contractor shall not install any equipment, piping, or duct that makes a rigid connection with the building unless isolation is not specified. "Building" includes, but is not limited to, slabs, beams, columns, studs and walls.
- E. Coordinate with Work of other sections to avoid rigid contact with the building.
- F. Any conflicts with Work of other sections which will result in rigid contact with equipment or piping due to inadequate space or other unforeseen conditions shall be brought to the Architect's/Engineer's attention prior to installation. Corrective work necessitated by conflicts after installation shall be at the Contractor's expense.
- G. Bring to the Architect's/Engineer's attention any discrepancies between the Types and the field conditions or changes required due to specific equipment selection, prior to installation. Corrective work necessitated by discrepancies after installation shall be at the Contractor's expense.
- H. Correct, at no additional cost, all installations which are deemed defective in workmanship and materials at the Contractor's expense.
- I. Overstressing of the building structure shall not occur because of overhead support of equipment. Contractor shall submit loads to the Engineer for approval. Generally, bracing may occur from:
  - 1. Flanges of structural beams.
  - 2. Upper truss cords in bar joist construction.
  - 3. Cast in place inserts or wedge type drill-in concrete anchors.
- J. Type 12 cable restraints shall be installed with slight slack to avoid short circuiting the isolated suspended equipment or piping.
- K. Type 12 cable assemblies are installed taut on non-isolated systems. Type 13 seismic solid braces may be used in place of cables on rigidly attached systems only.
- L. At locations where Type 12 or 13 restraints are located, the support rods must be braced when necessary to accept compressive loads with Type 14 braces.

- M. At all locations where Type 12 or 13 restraints are attached to pipe clevises, the clevis cross bolt shall be reinforced with Type 15 braces.
- N. Drill-in concrete anchors for ceiling and wall installation shall be Type 18, and Type 19 female wedge type for floor mounted equipment.
- O. Vibration isolation manufacturer shall furnish integral structural steel bases as required. Independent steel rails are not permitted on this Project.
- P. Hand built elastomeric expansion joints may be used when pipe sizes exceed 24 inches or specified movements exceed Type 23 capabilities.
- Q. Where piping passes through walls, floors or ceilings the vibration isolation manufacturer shall provide Type 27 wall seals.
- R. Air handling equipment and centrifugal fans shall be protected against excessive displacement which results from high air thrust in relation to the equipment weight. Horizontal thrust restraint shall be Type 28 (see selection guide).
- S. Locate isolation hangers as near to the overhead support structure as possible.

### 3.2 SEISMIC RESTRAINTS

#### A. Vibration Isolation of Piping

- 1. Horizontal pipe isolation: The first three pipe hangers in the main lines near the mechanical equipment shall be as described in Type 11. Type 11 hangers shall also be used in all transverse braced isolated locations. Brace hanger rods with Type 14 SRC clamps. Horizontal runs in all other locations throughout the building shall be isolated by hangers as described in Type 10. Floor supported piping shall rest on isolators as described in Type 6. Heat exchangers and expansion tanks are considered part of the piping run. The first three isolators from the isolated equipment will have the same static deflection as specified for the mountings under the connected equipment. If piping is connected to equipment located in basements and hangs from ceilings under occupied spaces, the first three hangers shall have 0.75-inch deflection for pipe sizes up to and including 3 inches, 1-1/2 inches deflection for pipe sizes up to and including 6 inches, and 2-1/2 inches deflection thereafter. Hangers shall be located as close to the overhead structure as practical. Where piping connects to mechanical equipment install Type 23 expansion joints or Type 24 stainless hoses.

#### B. Seismic Restraint of Piping

- 1. Seismically restrain all piping listed as a, b or c below. Use Type 12 cables if isolated. Type 12 or 13 restraints may be used on unisolated piping.
  - a. Fuel oil piping, gas piping, medical gas piping, and compressed air piping that is 1 inch I.D. or larger.
  - b. Piping located in boiler rooms, mechanical equipment rooms, and refrigeration equipment rooms that is 1-1/4 inches I.D. and larger.

- c. All other piping 2-1/2 inches diameter and larger.
2. Transverse piping restraints shall be at 40 feet maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.
3. Longitudinal restraints shall be at 80 feet maximum spacing for all pipe sizes, except where lesser spacing is required to limit anchorage loads.
4. Where thermal expansion is a consideration, guides and anchors may be used as transverse and longitudinal restraints provided they have a capacity equal to, or greater than, the restraint loads in addition to the loads induced by expansion or contraction.
5. For fuel oil and all gas piping, transverse restraints shall be at 20 feet maximum and longitudinal restraints at 40 feet maximum spacing.
6. Transverse restraint for one pipe section may also act as a longitudinal restraint for a pipe section of the same size connected perpendicular to it if the restraint is installed within 24 inches of the elbow or TEE, or combined stresses are within allowable limits at longer distances.
7. Use hold-down clamps to attach pipe to all trapeze members before applying restraints in a manner similar to clevis supports.
8. Branch lines will not be allowed as a restraint for main lines.
9. Cast iron pipe of all types, glass pipe and any other pipes joined with a four band shield and clamp assembly shall be braced by means of Type 10 hangers or Type 5 floor isolators. Spring deflection shall be a minimum of 0.75 inches.

C. Seismic Restraint of Ductwork

1. Seismically restrain all duct work with Type 12 or 13 restraints as listed below:
  - a. Restrain rectangular ducts with cross-sectional area of 6 sq.ft. or larger.
  - b. Restrain round ducts with diameters of 28 inches or larger.
  - c. Restrain flat oval ducts the same as rectangular ducts of the same nominal size.
2. Transverse restraints shall occur at 30-foot intervals or at both ends of the duct run if less than the specified interval. Transverse restraints shall be installed at each duct turn and at each end of a duct run.
3. Longitudinal restraints shall occur at 60-foot intervals with at least one restraint per duct run. Transverse restraints for one duct section may also act as a longitudinal restraint for a duct Section connected perpendicular to it if the restraints are installed within 4 feet of the intersection of the ducts and if the restraints are sized for the larger duct. Duct joints shall conform to SMACNA duct construction standards.
4. The ductwork must be reinforced at the restraint locations. Reinforcement shall consist of an additional angle on top of the ductwork that is attached to the support hanger rods. Ductwork is to be attached to both upper angle and lower trapeze.
5. A group of ducts may be combined in a larger frame so that the combined weights and dimensions of the ducts are less than, or equal, to the maximum weight and dimensions of the duct for which bracing details are selected.
6. Walls, including gypsum board non-bearing partitions, which have ducts running through them may, replace a typical transverse brace. Provide channel framing around ducts and solid blocking between the duct and frame.

- D. All mechanical equipment shall be vibration isolated and seismically restrained as per the schedules on the Drawings.

### 3.3 SEISMIC RESTRAINT EXCLUSIONS

- A. The following exclusions may be allowed only if they do not violate the requirements of the state building code and ASCE/SEI 7:
  - 1. Piping
    - a. All clevis or trapeze supported piping suspended from hanger rods where the point of attachment is less than the 12 inches in length from the structure to the structural connection of the clevis or trapeze.
  - 2. Ductwork
    - a. Rectangular, square or oval ducts less than 6 sq.ft. in cross-sectional area.
    - b. Round duct less than 28 inches in diameter.
    - c. Duct supported by hanger rods where the point of attachment is less than 12 inches in length from the structure to the structural connection of the ductwork. Suspended equipment.

END OF SECTION 23 05 48



State of Rhode Island  
Division of Purchases  
One Capitol Hill  
Providence, RI 02908

**"MANDATORY" PRE-BID CONFERENCE SIGN IN SHEET**

Mandatory Pre-bid Conference: Any vendor who intends to submit a bid proposal in response to this solicitation must have its representative attend this mandatory prebid conference, sign, and complete all required information on this Sign-In Sheet. Failure to comply with this requirement will result in the rejection of any bid proposal.

**BID NUMBER:** 7551144  
**BID TITLE:** Replacement of Existing Cooling Tower - CCRI Newport Campus  
**PRE-BID DATE AND TIME:** 11/30/2016 @ 10:00 am

**Purchasing Representative:** Gary P. Mosca  
**Mandatory Pre-bid START TIME:** 11:30 AM  
**Mandatory Pre-bid END TIME:** 12:22 PM

COMPANY NAME	COMPANY REPRESENTATIVE	SIGNATURE	ADDRESS	CONTACT E-MAIL	CONTACT PHONE NUMBER AND FAX NUMBER	PROPOSAL SUBMITTED (For Purchasing Use Only)
State of RI	GARY P. MOSCA	<i>[Signature]</i>	CASE (MOUTH) HALL PROV RI 02908	gpmosca@purchasing.ri.gov	401-574-4124	
CCRI	LISA TONTE	<i>[Signature]</i>	400 EAST AVE WARWICK	ltonks@ccri-ri.edu	401-885-2444	
CCRI	MARK LIBOFF					
CCRI	FRANK MILLS					
ASSOCIATE	Charles Westcott	<i>[Signature]</i>	37 Iron Horse RD. 449 COOK ST.	charwestcott@assocri.com	401-644-7920	
ALL STATE	ARREN FARRINGTON	<i>[Signature]</i>	700 GRAFT ROAD LINCOLN RI	ARRENTON@ALLSTATE.COM	800-676-0675 401-766-3100	
will city coast	STEPHEN CARO	<i>[Signature]</i>	250 Scrampton Road N. Kingston	scaro@willcity.com	401-768-8810	
Bentley	Paul Terry	<i>[Signature]</i>	205 Hurler Rd Warwick RI	pterry@bentley.com	401-950-1841	
NEXSEN med	Jim Masone	<i>[Signature]</i>	44 Wilem St Narragansett	masone@nexusmed.com	401-787-7511 401-921-3211	
Delta West	Michael Spooner	<i>[Signature]</i>	1 Harry St. Narragansett	mspooner@delta-west.com	401-737-3520 401-473-9989	
SARA ENG.	JUSTIN FORSE	<i>[Signature]</i>	1 Harry St. Narragansett	justin@saera.com	401-943-1050 401-943-5179	
SARA ENG.	Jim Calverie	<i>[Signature]</i>	1 Harry St. Narragansett	calverie@saraeng.com	401-943-1050	
SMITH AC	Bruce Hanson	<i>[Signature]</i>	116 Lydia Award Smithfield, RI	bruce@smithac.com	401-233-7930 401-233-7990	