SECTION 26 05 48

VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 INTENT

A. It is the intent of this Specification to provide the basis of design for the vibration isolation, accommodation of differential seismic motion across building expansion/seismic joints, and seismic restraints on all systems specified under Divisions 26, 27 and 28. The term "SYSTEMS" applies to all equipment and raceways on the project. The following Specification provides a requirement for the attachment of all non-structural components to the structure. Vibration isolation is required for all electrical systems. Seismic restraints are not required for electrical systems with the exception of normal and emergency distribution serving lighting and circuiting associated with these systems. Seismic support requirements are also to be maintained for all equipment and distribution and circuiting associated with Area of Refuge systems and entire Fire alarm system.

1.02 RELATED DOCUMENTS

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

1.03 SUMMARY

A. This Section includes the following:
   1. Isolation pads.
   2. Spring isolators.
   3. Restrained spring isolators.
   4. Channel support systems.
   5. Restraint cables.
   6. Hanger rod stiffeners.
   7. Anchorage bushings and washers.
   8. Building expansion/seismic joint accommodation equipment.

B. Related Sections include the following:
   1. Section 260529 "Hangers and Supports for Electrical Systems" for commonly used electrical supports and installation requirements.

1.04 DEFINITIONS

A. The IBC: International Building Code.

B. ICC-ES: ICC-Evaluation Service.

C. Vibration-Sensitive Areas: For the purposes of applying the base and isolation types listed at the end of this Section, the areas designated as vibration-sensitive are as follows:

1.05 PERFORMANCE REQUIREMENTS

A. Comply with seismic restraint requirements in accordance with state and local codes and ordinances and the authority having jurisdiction.

B. Determine the following, but not limited to, design criteria conditions for the project location required in accordance with all state and local codes and ordinances. Include criteria with code references in shop drawing submittal.

C. Seismic-Restraint Loading:
1. Site Class as Defined in the IBC: E.
2. Assigned Seismic Use Group or Building Category as Defined in the IBC: II.
   a. Component Importance Factor: 1.5 for life safety systems, components with hazardous content, and components required for continued operation in Seismic Use Group III structures; 1.0 for all other components.
   b. Component Response Modification Factor: As determined by the Seismic Engineer.
   c. Component Amplification Factor: As determined by the Seismic Engineer.
3. Design Spectral Response Acceleration at Short Periods (0.2 Second):
4. Design Spectral Response Acceleration at 1.0-Second Period:
5. Seismic Design Category: C; Electrical components with Importance Factor (I_p) = 1.5 require seismic bracing, but components with I_p = 1.0 are exempt from requirements for seismic bracing.

D. Determine and design system accommodation of differential seismic motion across building expansion/seismic joints. Motion to be accommodated shall be determined by the Architect and the Structural Engineer of Record. Accommodation can be designed by either of the following suitable for project conditions and layout:
1. Design systems to have inherent flexibility required to accept the differential motion using pipe loops and/or offsets.
2. Design system arrangement to localize area at which differential motion will occur by anchoring to each building and provide a set of expansion joints arranged to accept the motion and forces determined.

1.06 ACTION SUBMITTALS

A. Product Data: For the following:
1. Include detailed type, style, materials, rated load, rated deflection, and overload capacity for each vibration isolation device.
2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
   a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction.

b. Annotate to indicate application of each product submitted and compliance with requirements.

3. Restrained-Isolation Devices: Include ratings for horizontal, vertical, and combined loads.

B. Delegated-Design Submittal: For vibration isolation and seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation and registered in the state of the project. Provide submittal in two parts - the first part to address all equipment on the project prior to installation, and the second submittal to address seismic bracing of raceways after the final routing has been determined.

1. Seismic Code Summary: Written summary of applicable codes, references, and criteria specific to the project.
2. List of all electrical equipment and systems with annotation of where seismic anchoring and bracing is applicable. If a particular component is exempt due to the conditions of the project, it shall be so stated.
3. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators and seismic restraints, and expansion/seismic joint accommodation.
   a. Coordinate design calculations with wind-load calculations required for equipment mounted outdoors. Comply with requirements in other electrical Sections for equipment mounted outdoors.
4. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
5. Field-fabricated supports.
6. Seismic-Restraint Details:
   a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
   b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events. Indicate association with vibration isolation devices.
   c. Preapproval and Evaluation Documentation: By an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).
7. Building Expansion/Seismic Joint Accommodation Details: Detail fabrication and attachment of seismic restraints and expansion compensators. Show piping configuration including expansion compensators and piping lengths. Show anchorage details and indicate strength, quantity, diameter, and depth of penetration of anchors. Indicate direction and value of forces transmitted to piping and structure during seismic event and thermal expansion.

1.07 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans and sections drawn to scale and coordinating seismic bracing and restraints for all components with other systems. Coordinate seismic restraints with

vibration isolation and expansion compensation systems. All piping vibration isolation hangers, seismic restraints, and building expansion/seismic joint accommodation are to be laid out by the seismic engineer on each coordination drawing. The vibration/seismic professional engineer of record shall stamp every coordination drawing. If a particular coordination drawing does not required any isolation or restraints, the vibration/seismic engineer shall duly note that condition and stamp the drawing. Layouts of the restraints and isolation hangers by field personnel are not acceptable.

B. Qualification Data: For professional engineer and testing agency.

C. Welding certificates.

D. Manufacturer Seismic Qualification Certification: Submit certification that all specified equipment will withstand seismic forces identified in "Performance Requirements" article above. Include the following:
   1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculations.
      a. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified and the unit will be fully operational after the seismic event."
   2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
   3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

E. Qualification Data: For firms and persons specified in "Quality Assurance" article.

F. Insurance Certifications: Submit for the following and in accordance with "Quality Assurance" article.
   1. Professional Engineer: Professional liability.
   2. Manufacturer: Product liability.

G. Material Test Reports: From a qualified testing agency indicating and interpreting test results of seismic control devices for compliance with requirements indicated.

H. Field quality-control test reports.

1.08 QUALITY ASSURANCE

A. Comply with seismic-restraint requirements in the IBC unless requirements in this Section are more stringent.

B. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage, preapproval by ICC-ES, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are

not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

D. Comply with NFPA 70.

E. Professional Engineer Qualifications: A professional vibration/seismic engineer who is legally qualified to practice in the jurisdiction where the project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of vibration isolation bases and seismic restraints that are similar to those indicated for this project in material, design, and extent. Engineer shall carry minimum of $1,000,000 professional liability insurance.

F. Manufacturers of all vibration isolation and seismic restraint devices shall carry a minimum of $5,000,000 product liability insurance for their products.

1.09 COORDINATION

A. Coordinate size and location of concrete bases with seismic anchoring and vibration isolation requirements. Cast anchor-bolt inserts into base. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Coordinate design of seismic restrains and vibration isolation design with expansion compensation systems.

C. Coordinate and design all attachments with building structural system.

D. Coordinate and design all duct and pipe accommodations for building expansion/seismic joint crossovers.

PART 2 - PRODUCTS

2.01 VIBRATION ISOLATORS

A. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
   1. Kinetics Noise Control.
   2. Mason Industries.
   3. Vibration Eliminator Co., Inc.
   4. Vibration Mountings & Controls, Inc.

B. Elastomeric Pads: Arrange in single or multiple layers of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
   1. Resilient Material: Oil- and water-resistant neoprene. Standard neoprene for indoor applications or where pad not exposed to elements. Bridge-bearing neoprene, complying with AASHTO M 251 for exterior applications or where pad is exposed to elements.

C. Spring Isolators: Freestanding, laterally stable, open-spring isolators.
   1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
   5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4-inch- thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig.
   6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

D. Restrained Spring Isolators: Freestanding, steel, open-spring isolators with seismic or limit-stop restraint.
   1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to weight being removed; factory-drilled baseplate bonded to 1/4-inch- thick, neoprene or rubber isolator pad attached to baseplate underside; and adjustable equipment mounting and leveling bolt that acts as blocking during installation.
   2. Restraint: Seismic or limit-stop as required for equipment and authorities having jurisdiction.
   3. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   4. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   5. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   6. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
   7. Shall have OSHPD or approved anchorage ratings.

E. Elastomeric Hangers: Single or double-deflection type, fitted with molded, oil-resistant elastomeric isolator elements bonded to steel housings with threaded connections for hanger rods and vertical limit stop. Color-code or otherwise identify to indicate capacity range.

F. Spring Hangers with Vertical-Limit Stop: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression and with a vertical-limit stop.
   1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
   2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
   3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
   4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
   5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
   6. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
   7. Adjustable Vertical Stop: Steel washer with neoprene washer "up-stop" on lower threaded rod.
   8. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

2.02 SEISMIC-RESTRAINT DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide comparable product by one of the following:
   1. Cooper B-Line, Inc.; a division of Cooper Industries.
   2. Hilti Inc.
   3. Kinetics Noise Control.
   4. Mason Industries.
   5. Unistrut; Tyco International, Ltd.
   6. Vibration Mountings & Controls, Inc.

B. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction.
   1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.

C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.

D. Restraint Cables: ASTM A 603 galvanized or ASTM A 492 stainless-steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

E. Hanger Rod Stiffener: Steel tube or steel slotted-support-system sleeve with internally bolted connections to hanger rod. Do not weld stiffeners to rods.

F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.

G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.

H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

I. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.

J. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless

steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.03 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION DEVICES

A. Flexible-Raceways and Loops: Refer to Section 260533 "Raceways and Boxes for Electrical Systems" for product requirements.
   1. Designed and installed in arrangement to accept motion and forces associated with seismic event and thermal expansion.

2.04 FACTORY FINISHES

A. Finish: Manufacturer's standard prime-coat finish ready for field painting.

B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
   1. Powder coating on springs and housings.
   2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
   3. Baked enamel or powder coat for metal components on isolators for interior use.
   4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and equipment to receive vibration isolation and seismic-control devices and building expansion/seismic joint accommodation for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction.

B. Hanger Rod Stiffeners: Install hanger rod stiffeners where required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.03 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Equipment and Hanger Restraints:
   1. Install restrained isolators on electrical equipment.
   2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
   3. Install seismic-restraint devices using methods approved by an evaluation service member of ICC-ES or an independent agency acceptable to authorities having jurisdiction providing required submittals for component. In no case will the LOOPING of cable around raceway systems be permitted on the Project. Seismic restraint cables and angles shall be mechanically attached to the raceway hangers with end fastening devices.

B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

C. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

D. Drilled-in Anchors:
   1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
   2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
   3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
   4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
   5. Set anchors to manufacturer's recommended torque, using a torque wrench.
   6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.04 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.05 FIELD QUALITY CONTROL

A. Upon completion of the project, the seismic design professional engineer of record shall visit the project site and supply a stamped letter of compliance. Any systems found to be installed insufficiently, provide additional measures necessary at contractor's expense to put the entire installation in compliance.

B. The Owner will engage a special inspector to perform field inspections and verification of proper installation of seismic anchorage and bracing of mechanical equipment, and manufacturer's component certifications of compliance. The contractor is to provide the special inspector safe access to the site throughout the duration of the mechanical work, and to provide timely notification to the special inspector at appropriate points in construction when seismic anchorage and bracing is to be installed.

C. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections and prepare test reports.

D. Tests and Inspections:
   1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
   2. Schedule test with Owner, through Architect, before connecting anchorage device to restrained component (unless postconnection testing has been approved), and with at least seven days' advance notice.
   3. Obtain Architect's approval before transmitting test loads to structure. Provide temporary load-spreading members.
   4. Test at least four of each type and size of installed anchors and fasteners selected by Architect.
   5. Test to 90 percent of rated proof load of device.
   6. Measure isolator restraint clearance.
   7. Measure isolator deflection.
   8. Verify snubber minimum clearances.
   9. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

E. Remove and replace malfunctioning units and retest as specified above.

F. Prepare test and inspection reports.

3.06 ADJUSTING

A. Adjust isolators after isolated equipment is at operating weight.

B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

C. Adjust active height of spring isolators.

D. Adjust restraints to permit free movement of equipment within normal mode of operation.

3.07 ELECTRICAL VIBRATION-CONTROL AND SEISMIC-RESTRAINT DEVICE SCHEDULE

A. General: Schedule below indicates type of vibration isolator to be used with types of equipment. All rotating equipment shall have vibration isolation whether listed in schedule or not. Where equipment is not listed, provide isolation type of similar equipment or manufacturer recommended. Schedule below only indicates seismic restraint integral with vibration isolators where applicable. Seismically restrain all equipment using materials and products specified in this Section. All equipment with vibration isolation shall be resiliently restrained.

B. Components Mounted on Slab-on-Grade:
   1. Transformers, Less Than 75 kVA:
      a. Base: None.
      b. Isolator Type: None, anchor to structure.
   2. Transformers, 75 kVA and Larger:
      a. Base: None.
      b. Isolator Type: None, anchor to structure.
   3. Engine-Driven Generators and Rotary UPS Equipment:
      a. Base: Concrete housekeeping pad.
      b. Isolator Type: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers 0.5 inches thick, 1 layer.

C. Components Mounted on Structural (Elevated) Slabs:
   1. Transformers, Less Than 75 kVA:
      a. Base: None.
      b. Isolator Type in Non-Vibration-Sensitive Areas: None, anchor to structure.
      c. Isolator Type in Vibration-Sensitive Areas: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers, 0.5 inches thick, 1 layer.
   2. Transformers, 75 kVA and Larger:
      a. Base: Concrete housekeeping pad.
      b. Isolator Type in Non-Vibration-Sensitive Areas: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers, 0.5 inches thick, 1 layer.
      c. Isolator Type in Vibration-Sensitive Areas: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers, 0.75 inches thick, 2 layers.
   3. Engine-Driven Generators and Rotary UPS Equipment:
      a. Base: Concrete housekeeping pad.
      b. Isolator Type in Non-Vibration-Sensitive Areas: Restrained spring isolators or spring isolators with seismic snubbers, 1.0 deflection.
      c. Isolator Type in Vibration-Sensitive Areas: Restrained spring isolators or spring isolators with seismic snubbers, 2.0 deflection.

D. Components Mounted on Roofs:
   1. Transformers, Less Than 75 kVA:
      a. Base: None.
      b. Isolator Type in Non-Vibration-Sensitive Areas: None, anchor to structure.
      c. Isolator Type in Vibration-Sensitive Areas: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers, 0.5 inches thick, 1.
   2. Transformers, 75 kVA and Larger:

a. Base: Concrete housekeeping pad.
b. Isolator Type in Non-Vibration-Sensitive Areas: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers, 0.5 inches thick, 1 layer.
c. Isolator Type in Vibration-Sensitive Areas: Restrained elastomeric mounts or elastomeric mounts with seismic snubbers, 0.75 inches thick, 2 layers.

3. Engine-Driven Generators and Rotary UPS Equipment:
a. Base: Concrete housekeeping pad.
b. Isolator Type in Non-Vibration-Sensitive Areas: Restrained spring isolators or spring isolators with seismic snubbers, 1.0 deflection.
c. Isolator Type in Vibration-Sensitive Areas: Restrained spring isolators or spring isolators with seismic snubbers, 2.0 deflection.

E. Components Hung From Overhead Structure:
1. Transformers, Less Than 75 kVA:
a. Isolator Type in Non-Vibration-Sensitive Areas: None.
b. Isolator Type in Vibration-Sensitive Areas: Elastomeric hangers with vertical limit stop, 0.2 deflection.
2. Transformers, 75 kVA and Larger:
a. Isolator Type in Non-Vibration-Sensitive Areas: Elastomeric hangers with vertical limit stop, 0.2 deflection.
b. Isolator Type in Vibration-Sensitive Areas: Spring hangers with vertical limit stop, 1.0 deflection.

END OF SECTION 26 05 48
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