



The City of **WORCESTER**

Administration & Finance – Purchasing Division
Christopher J. Gagliastro, MCPPO – Purchasing Director
455 Main Street, Room 201, Worcester, MA 01608
P | 508-799-1220
purchasing@worcesterma.gov

October 16, 2026

To All Bidders:

Subject: **Bid No. 8833-M7 – Waterproofing & Repairs– Union Station Garage / DPF-FTA**

ADDENDUM NO. 1

To Whom It May Concern:

With reference to our bid request relative to the above subject, please refer to the changes/modifications/clarifications to the original proposal request.

PART 2 – SPECIFICATIONS

Section 040001 – MASONRY WORK – **DELETE** this section entirely. Filed sub bids for masonry work are not required. The General Contractor shall include the cost of Division 4 work in the general bid.

Section 220001 – PLUMBING, **ADD** the following sub-paragraphs to paragraph 1.2.A:

3. All of the work of Section 220529 – HANGERS AND SUPPORTS
4. All of the work of Section 220548 – VIBRATION CONTROL
5. All of the work of Section 220553 – PLUMBING IDENTIFICATION

Section 230529 – HANGERS AND SUPPORTS, **DELETE** entirely

Section 230548 – VIBRATION CONTROL, **DELETE** entirely

Section 230553 – MECHANICAL IDENTIFICATION, **DELETE** entirely

ADD new Section 220529 – HANGERS AND SUPPORTS

ADD new Section 220548 – VIBRATION CONTROL

ADD new Section 220553 – PLUMBING IDENTIFICATION



PART 3 – DRAWINGS

Sheet R-9, Detail 6, **DELETE** this detail entirely.

PART 4 – CONTRACTOR QUESTIONS

Q: Is building permit fee waived??

A: Read Section 002000 Paragraph 4.7

Q: Is second shift and/or weekend work permitted to meet schedule??

A: Yes, with proper advanced scheduling/coordination with the Owner and Parking Management company.

Q: Will the general contractor have the entire garage between Oct 1 - Jan 1 to complete all repair work?? If not, is there a phasing plan or how many parking spaces are allowed to be taken at a time for repair works??

A: The garage must remain open to the public. Generally, areas of 50-100 spaces can be cordoned off to permit work. Contractors must prepare a construction sequencing plan for review and approval by the Owner, at the pre-construction meeting.

Q: Do the existing elevators need to be in service during construction??

A: Elevators may be taken out of service to perform the work required in the elevator pit, with proper scheduling in advance. Otherwise, they must remain in service. Contractors are responsible for coordinating and paying for the elevator service contractor to perform the shutdown. The service contract is currently held by United Elevator Company. Contact Walter Targonski, Account Manager at (413) 432-9524 (office), (413) 351-1145 (cell) or walter@unitedelevatorcorp.com

Q: Is there any restriction on noisy work??

A: See Section 001000, Page 2, “Noise Ordinance” and Section 003000 Paragraphs 4.8.1 and 4.9.1

Q: Are power and water sources available on site for contractor use??

A: Yes. See Section 015000 Paragraphs 2.2 and 2.4

Q: Can contractor use onsite bathrooms??

A: No. See Section 015000 Paragraph 2.5



The City of **WORCESTER**

Administration & Finance – Purchasing Division
Christopher J. Gagliastro, MCPPO – Purchasing Director
455 Main Street, Room 201, Worcester, MA 01608
P | 508-799-1220
purchasing@worcesterma.gov

Q: What is the total thickness of existing garage decks??

A: Pre-cast concrete tee flanges are 4 inches thick.

Q: Can epoxy mortar be used in lieu of sealant at double-T's lift pockets??

A: Epoxy mortars such as Sikadur-22 Lo-Mod which meet ASTM C-881 for Type III, Grade 2, Class C materials can be used in lieu of sealant.

Q: Will there be any supplemental rebar required at repair areas?? If so, please provide quantity or an allowance to be carried.

A: Include a total of 50 pounds of #4 reinforcing bars, to be used for replacing deteriorated bars where required or directed.

Q: Please identify location of all existing utilities (e.g. electrical, plumbing, HVAC, and sprinkler) lines, piping, ductwork, and fixtures or provide an allowance to be carried for any incidental temporary removal or relocation of such to accommodate and/or facilitate repair work.

A: What utilities require removal or can be worked around is the bidder's decision and considered means and methods. There are no finished ceilings in the building, and the building is open for public inspection at any time. Two pre-bid meetings have been held, and bidders are free to inspect the site at any time.

Q: Please identify depth of repair in details 2/R-8, 3/R-8, 2/R-9, and 3/R-9.

A: 2/R-8 = 4"; 3/R-8 = 2.5"; 2/R-9 = 5"; 3/R-9 = 3"

Q: What is the joint width of existing expansion joint to be replaced??

A: Joint size to suit existing conditions. Verify in field.

Q: Drawings only indicate 25 bricks to be replaced, and this hardly meets the threshold for a FSB. Please clarify.

A: The masonry filed sub-bid is being withdrawn. The General Contractor shall include the work of Division 4 in the general bid. Refer to Part 2 of this addendum.

Q: Specifications 042000 calls for "brick walls" to be built. However, drawings don't show any notes or locations of new brick walls. There are no corresponding S-drawings showing how the brick walls are built. Please clarify.

A: Confirming that the spec language does not pertain to this project scope. No new walls are being built. Brick work is limited to locations shown on R-7.



The City of **WORCESTER**

Administration & Finance – Purchasing Division
Christopher J. Gagliastro, MCPPO – Purchasing Director
455 Main Street, Room 201, Worcester, MA 01608
P | 508-799-1220
purchasing@worcesterma.gov

Q: Detail 6/R-9 shows tuck pointing but none shown anywhere on the drawings. Please clarify.

A: This detail will be deleted. Refer to Part 3 of this addendum.

Q: Will the exterior of the garage be pressure washed??

A: New work is specified to be washed. It is not the intent of the specification to wash the entire building.

Q: Are we to assume the linear footage for detail 4/A2 is included within the quantities legend provided on dwg. R7?

A: No. The legend on R7 specifically reads “at precast façade joints”. Detail 4/A2 is pointing to joints between the coping/parapet stones on the penthouse roof.

Q: Please clarify scope/location(s) of Division-23 HVAC. I do not see this work indicated on the drawings.

A: The Division 23 sections were improperly numbered, and should be Division 22 and part of the plumbing filed sub bid. Refer to Part 2 of this addendum for specification changes to be made.

Q: Is any identification required at the annunciator near the primary vehicular entrance?

A: Provide adhesive vinyl die cut letters 4 inches tall in a sans-serif font, reading “225 FRANKLIN STREET” and apply them to the glass transom above the entry door beside the vehicular entrance/exit to the garage.

Bidders are requested to acknowledge and/or include this addendum with submission. All other terms, conditions and specifications remain unchanged.

Very truly yours,

Stephen R. McDonald
Assistant Purchasing Director

SECTION 220001 – PLUMBING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.
- B. Time, Manner and Requirements for Submitting Sub-Bids:
 - 1. Each sub-bid submitted for work required under this Section shall be on forms furnished in this specification and in accordance with the provisions of M.G.L. c.149 SS44A-J. Sub-bidders must be DCAM Certified in the listed trade and shall include a Current DCAM Sub-bidder Certificate of Eligibility and signed DCAM Sub-bidder's Update Statement with their bid.
 - 2. Sub-Bids submitted shall be accompanied by BID BOND, CERTIFIED CHECK, or TREASURER'S CHECK, or CASHIERS CHECK, issued by a responsible bank or trust company, payable to the City of Worcester, in the amount of five percent (5%) of the bid. A sub-bid accompanied by any other form of bid deposit may be rejected.
- C. Sub Sub-Bid Requirements: None required under this Section.
- D. Reference Drawings: The Work of this Filed Sub Bid is shown on the following Contract Drawings:

<u>NUMBER</u>	<u>SHEET NAME</u>
PL-001	Underground Plumbing Legend and Notes
PL-101	Underground Plumbing New Work Plan
PL-102	Ground Floor Plumbing New Work Plan
PL-601	Plumbing Schedules

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
 - 1. All Work of Section 22 05 29 – Hangers and Supports
 - 2. All Work of Section 22 05 48 – Vibration Control
 - 3. All Work of Section 22 05 53 – Plumbing Identification
 - 4. All Work of Section 22 11 23 – Plumbing Pumps
 - 5. All Work of Section 22 13 16 - Drainage and Vent Systems
- B. Alternates: Not Applicable.

END OF SECTION

SECTION 22 05 29 HANGERS AND SUPPORTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Horizontal piping hangers and supports.
 - 2. Vertical piping clamps.
 - 3. Hanger rod attachments.
 - 4. Building attachments.
 - 5. Saddles and shields.
 - 6. Miscellaneous materials.
 - 7. Pipe alignment guides.
 - 8. Anchors.
 - 9. Equipment supports.
- B. Related Sections:
 - 1. For spring isolation hangers refer to Division 22 section, “VIBRATION CONTROL”.

1.3 SUBMITTALS

- A. Product data, including installation instructions for each type of hangers and supports. Submit pipe hanger and support schedule showing Manufacturer's figure number, size, piping system, and features for each required.
- B. Welder certificates signed by Contractor certifying that welders comply with requirements specified under “Quality Assurance” Article.
- C. Maintenance data for engineered hangers and supports for inclusion in Operating and Maintenance Manual specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with applicable codes pertaining to product materials and installation of supports and anchors.

PART 2 – PRODUCTS

2.1 MANUFACTURED UNITS

- A. Hangers and support components shall be factory fabricated of materials, design, and manufacturer complying with MSS SP-58, current edition.
- B. Pipe attachments shall have nonmetallic coating for electrolytic protection or shall be of copper construction where attachments are in direct contact with copper tubing.
- C. Pipe Alignment Guides: Factory fabricated, of cast semi-steel or heavy fabricated steel, consisting of bolted two-section outer cylinder and base with two-section guiding spider that bolts tightly to pipe. Length of guides shall be as recommended by manufacturer to allow required travel.

2.2 MISCELLANEOUS MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which supports and anchors are to be installed. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Review with the Architect substrates of questionable integrity prior to installation.

3.2 INSTALLATION OF HANGERS AND SUPPORTS

- A. General: Install hangers, supports, clamps and attachments to support piping properly from building structure; comply with MSS SP-69 and SP-89. Install supports with maximum spacings complying with the most stringent of:
 - 1. MSS SP 69, latest edition.
 - 2. Applicable Plumbing Codes.
 - 3. The following schedule:

	Pipe Size	Steel Pipe	Copper Pipe	Cast Iron Pipe	PVC Pipe
Horizontal	≤¾"	7'	5'	10'	4'
	1" – 1 ¼"	7'	6'	10'	4'
	1½"	9'	8'	10'	4'
	2"	10'	8'	10'	4'
	2½"	11'	9'	10'	4'
	≥3"	12'	10'	10'	4'

	Pipe Size	Steel Pipe	Copper Pipe	Cast Iron Pipe	PVC Pipe
Vertical	All sizes: at every floor or as scheduled	12'	12'	10'	4'

- a. The above chart reflects PVC pipe spacing with 100°F fluid temperature. Higher temperatures may require closer spacings, refer to manufacturer's printed recommended spacings.
- B. Arrange for grouping of parallel runs of horizontal piping supported together on field fabricated, heavy duty trapeze supports where possible. Where piping of various sizes are supported together by trapeze supports, space hangers for smallest pipe size or install intermediate supports for smaller diameter pipe as specified above for individual pipe hangers. Where piping is supported with trapeze supports, install clamps or clips to keep lines in their relative lateral positions. Lines subject to thermal expansion shall be free to roll axially or slide on the piping support.
- C. Install building attachments within concrete or to structural steel. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten insert to forms
- D. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- E. Steel 'C' clamps (MSS type 23) are permitted for use with hangers supporting single pipes ≤2". Use malleable iron beam clamps (MSS type 19) or center beam hangers (MSS types 21, 22, 27, 28, 29, or 30) for single pipe hangers >2" and multiple pipe hangers
- F. Trapezes: Provide field fabricated or pre-manufactured.
 1. Field Fabricated, Heavy Duty Steel Trapezes: Fabricate from steel shapes selected for loads required; weld steel in accordance with AWS D-1.1.
 2. Manufactured Steel Trapezes: Manufactured steel channel shapes of dimensions and gauge as required for loads carried per ASTM A570 GR 33 and A366 as manufactured by Unistrut or approved equal.
 3. Trapeze hangers shall be sized for all loads imposed on the trapeze and in accordance with all applicable codes.
 4. Where trapeze hangers support fire protection pipes, the trapeze must conform to the requirements of NFPA 13.
 5. Trapezes for exterior locations must be provided with a galvanized or rust inhibiting acrylic baked enamel finish.

- G. Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends and similar units.
- H. Load Distribution: Install hangers and supports so that piping live and dead loading and stresses from movement will not be transmitted to connected equipment.
- I. Pipe Slopes: Install hangers and supports to provide indicated and specified pipe slopes, and so that maximum pipe deflections allowed by ASME B31.9 Building Services Piping Code is not exceeded.
- J. Uninsulated Piping: Provide adjustable clevis hangers, MSS Type-1. Provide steel for use with steel piping and copper for use with copper piping. For any other piping system, provide hangers of a compatible material.

3.3 INSULATED PIPING REQUIREMENTS

- A. Supports for steam and condensate return piping 2" and larger and heating hot water piping 3" and larger shall be provided with a slide support or saddle and roller hanger:
 - 1. Provide Teflon slide type supports MSS Type 35 or provide protection saddles MSS Type 39 with either adjustable roller hangers MSS Type 43 or single pipe rolls MSS type 41. Fill interior voids of saddles with segments of insulation that match adjoining pipe insulation
- B. Supports for piping lines 1-1/2" and larger and not provided with a slide or saddle and roller, shall be provided with a non-compressible insulation insert and shield:
 - 1. Hangers: Provide adjustable steel clevis hangers MSS Type 1 for insulated piping, sized for insulation outside diameter.
 - 2. Shields: Install G-90 galvanized steel protective insulation shields MSS type 40.
 - 3. Shields shall span an arc of 180°, minimum sizes as follows:

Pipe Size	Length	Thickness
1/4" → 3 1/2"	12"	18 ga
4"	12"	16 ga
5" → 6"	18"	16 ga
8" → 14"	24"	14 ga
16" → 24"	24"	12 ga

- 4. Inserts: Install high compressive strength calcium silicate insert at hangers. Insert material shall be at least as long as the protective shield. Insert shall encompass at least the bottom 180° of the piping.
 - a. Where piping insulation includes a vapor barrier, the vapor barrier must

be continuous over the non-compressible insert insulation.

- C. Supports for all insulated piping that does not require a slide or saddle and roll or non-compressive insert shall be provided with a protective shield that complies with above requirements for shields.

3.4 INSTALLATION OF ANCHORS

- A. Fabricate and install anchors by welding steel shapes, plates, and bars to piping and to structure. Comply with ASME B31.9 and with AWS Standards D1.1.
- B. Where expansion compensators are indicated, install anchors in accordance with expansion unit manufacturer's written instructions to control movement to compensators.
- C. Anchor Spacings: Where not otherwise indicated, install anchors at ends of principal pipe runs, at intermediate points in pipe runs between expansion loops and bends. Make provisions for preset of anchors as required to accommodate both expansion and contraction of piping.

3.5 INSTALLATION OF PIPE ALIGNMENT GUIDES

- A. Install pipe alignment guides on piping that adjoins expansion joints and elsewhere as indicated.
- B. Anchor to building substrate.
- C. Cold set in accordance with manufacturer recommendations.

3.6 EQUIPMENT SUPPORTS

- A. Fabricate structural steel stands to suspend equipment from structure above or support equipment above floor.
- B. Grouting: Place grout under supports for piping and equipment.

3.7 METAL FABRICATION

- A. Cut, drill, and fit miscellaneous metal fabrications for pipe anchors and equipment supports. Install and align fabricated anchors in indicated locations.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1 for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correcting welding work, and the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Grind smooth welds at exposed connections so that no roughness shows after finishing, and so that contours of welded surfaces match adjacent contours.

3.8 ADJUSTING

- A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Touch Up Painting: Immediately after erection of anchors and supports, clean field welds and abraded areas of shop paint and paint exposed areas with same material as used for shop painting to comply with SSPC-PA-1 requirements for touch-up of field-painted surfaces.
- C. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
- D. For galvanized surfaces clean welds, bolted connections and abraded areas and apply galvanizing repair finish to comply with ASTM A 780.

END OF SECTION 220529

SECTION 22 05 48 - VIBRATION CONTROL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this Section.
- B. This Section shall be considered as a part of each Division 22 section making reference to vibration control products specified herein.

1.2 SUMMARY

- A. Extent of vibration control work required by this Section is indicated on Drawings and schedules, and/or specified in other Division 22 sections.
- B. Types of vibration control products specified in this Section include the following:
 - 1. Vibration Isolation Springs.
 - 2. Flexible Pipe Connectors.
- C. Vibration control products furnished as integral part of factory-fabricated equipment are specified as part of equipment assembly in other Division 22 sections.
- D. Refer to other Division 22 sections for equipment foundations, hangers, sealants, gaskets, and other work related to vibration control work.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of vibration control product. Submit schedule showing size, type, deflection, and location for each product furnished.
- B. Shop Drawings: Submit manufacturer's assembly-type shop drawings indicating dimensions, weights, required clearances, and method of assembly of components. Detail bases, and show location of equipment anchoring points, coordinated with equipment manufacturer's shop drawings. Provide detail application charts indicating how similar isolators of different capacities are differentiated.
- C. Maintenance Data: Submit maintenance data for each type of vibration control product. Include this data, product data, and shop drawings in maintenance manual; in accordance with requirements of Division 1.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of vibration control products, of type, size, and capacity required, whose products have been in satisfactory use in similar service for not less than 5 years.
 - 1. Except as otherwise indicated, obtain vibration control products from single manufacturer.
 - 2. Engage manufacturer to provide technical supervision of installation of vibration control products.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturer: Subject to compliance with requirements, provide vibration control products of one of the following:
 - 1. Amber/Booth Co.
 - 2. Kinectics Noise Control
 - 3. Korfund Dynamics Corp.
 - 4. Mason Industries, Inc.
 - 5. Sound Seal, United Process, Inc.
 - 6. Vibration Mountings and Controls, Inc.

2.2 VIBRATION CONTROL MATERIALS AND SUPPORTS UNITS

- A. General: The references to type refer to the descriptions noted in the 2015 ASHRAE HVAC Applications Handbook, chapter 48.
- B. Vibration Isolation Springs: Wound-steel compression springs, or high-strength spring alloy steel; with spring diameter not less than 0.8 of compressed height of spring at rated loads. Provide minimum additional travel to solid, equal to 50% of rated deflection. Provide spring wire with elastic limit stress exceeding at solid deflection.
 - 1. Spring Isolators, Free-Standing (Type 3): Except as otherwise indicated, provide vibration isolation spring between top and bottom loading plates, and with pad-type isolator bonded to bottom of bottom loading plate. Include studs or cups to ensure centering of spring on plates. Include leveling bolt with lock nuts and washers, centered in top plate, arranged for leveling and anchoring supported equipment as indicated. Include holes in bottom plate for bolting unit to substrate as indicated.
 - 2. Spring Isolators, Housed (Type 4): Except as otherwise indicated, provide vibration isolation spring between telescoping steel housings with top and bottom loading plates, and with pad type isolator bonded to bottom of loading plate.

Include resilient inserts to separate and guide telescoping housings.

- a. Equip top loading plate with equipment anchorages as indicated or as required for support and attachment.
 - b. Include pad type isolator bonded to top of top loading plate, except on units with leveling bolts.
 - c. Include holes in bottom plate for bolting unit to substrate.
3. Spring Isolators, Vertically-Restrained (Type 4): Provide spring isolators in housing that includes vertical limit stops. Design housing to act as blocking during erection, and with installed height and operating height being equal. Maintain 1/2" minimum clearance around restraining bolts, and between housing and springs. Design so limit stops are out of contact during normal operation.
 4. Spring Isolators, Earthquake-Restrained: Provide spring isolator assembly which will resist horizontal and vertical forces.
- C. Flexible Pipe Connectors:
1. For non-ferrous piping, provide bronze hose covered with bronze wire braid with copper tube ends or bronze flanged ends, braze-welded to hose.
 2. Flexible Pipe Connectors: Provide neoprene or EDPM construction consisting of multiple plies of nylon tire cord fabric and elastomer molded and cured in hydraulic rubber presses. Provide straight or elbow connector as indicated, rated at 125 psi at 220°F.

PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine areas and conditions under which vibration control units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 PERFORMANCE OF ISOLATORS

- A. General: Comply with minimum static deflections recommended by ASHRAE, for selection and application of vibration isolation materials and units as indicated.
- B. Manufacturer's Recommendations: Except as otherwise indicated, comply with manufacturer's recommendations for selection and application of vibration isolation materials and units.

3.3 APPLICATIONS

- A. General: Select vibration control products in accordance with the 2015 ASHRAE HVAC Applications Handbook, Chapter 48 "Sound and Vibration Control". Where more than one type of product is offered, selection is Designer's option and shall be submitted for review. Amend Chapter 48 as follows:
1. Tank mounted air compressors and vacuum pumps ≤ 10 HP, located on other than slab on grade, shall be mounted on type 'C' base.
 2. Close coupled, end suction, and split case pumps on grade shall be as recommended by the manufacturer.
 3. Package roof top equipment can be mounted directly on manufacturer's roof curb without additional external curb isolation.
 4. Provide thrust restraints only on fans 5 HP and larger, and where fan is supported on spring isolators (fans mounted on roof curbs such as power roof exhaust fan and wall mounted propeller fans do not fall under this requirement).
- B. Piping: For piping connected to equipment mounted on vibration control products, install pipe isolation hangers for first points according to the following schedule:

Isolated Pipe Hanger Requirements	
Pipe Size	Quantity of Isolated Supports
$\leq 4"$	3
5" $\rightarrow$ 8"	4
$\geq 10"$	6

3.4 INSTALLATION

- A. General: Except as otherwise indicated, comply with manufacturer's instructions for installation and load application to vibration control materials and units. Adjust to ensure that units have equal deflection, do not bottom out under loading, and are not short-circuited by other contacts or bearing points. Remove space blocks and similar devices intended for temporary support during installation.
- B. Install units between substrate and equipment as required for secure operation and to prevent displacement by normal forces, and as indicated.
- C. Adjust leveling devices as required to distribute loading uniformly onto isolators. Shim units as required where substrate is not level.
- D. Locate isolation hangers as near overhead support structure as possible.
- E. Weld riser isolator units in place as required to prevent displacement from loading and operations.

- F. Flexible Pipe Connectors: Install on equipment side of shutoff valves, horizontally and parallel to equipment shafts wherever possible.

3.5 ADJUSTING AND CLEANING

- A. Clean each vibration control unit, and verify that each is working freely, and that there is no dirt or debris in immediate vicinity of unit that could possibly short-circuit unit isolation.

END OF SECTION 220548

SECTION 22 05 53 - PLUMBING IDENTIFICATION

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work of this Section.

1.2 SUMMARY

- A. Types of identification devices specified in this Section include the following:
 - 1. Plastic Pipe Markers.
 - 2. Valve Tags.
 - 3. Plastic Equipment Markers.
 - 4. Plasticized Tags.
 - 5. Adhesive Labels.
- B. Plumbing identification furnished as part of factory fabricated equipment is specified as part of equipment assembly in other Division 22 sections.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical product data and installation instructions for each identification material and device required. Provide a list of the nomenclature as well as the color scheme intended for use for identification of pipe services.
- B. Schedules: Submit valve schedule for each piping system, typewritten and produced on Plumbing Contractor's letterhead or 8½" x 11" bond paper. Tabulate valve number, piping system, system abbreviation (as shown on tag), location of valve (room or space), and variations for identification (if any). Mark valves that are intended for emergency shutoff and similar special uses, by special "flags", in margin of schedule. In addition to mounted copies, include valve tag schedules in the Maintenance Manuals that include all of the valve schedules.
- C. Maintenance Data: Include product data and schedules in maintenance manuals; in accordance with requirements of Division 1.

1.4 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of identification devices of types and sizes required, whose products have been in satisfactory use in similar service for not less than five years.
- B. Codes and Standards:
 - 1. ANSI Standards: Comply with ANSI A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

PART 2 – PRODUCTS

2.1 PLASTIC PIPE MARKERS

- A. Pressure sensitive vinyl markers with flow arrows and factory applied graphics. Additionally, provide minimum 1½" wide, self-adhesive, pressure sensitive bands to further secure the marker to the pipe.
- B. Pressure sensitive polyester markers suitable for exterior use with flow arrows and factory applied graphics.
- C. Insulation: Furnish ½" thick molded fiberglass insulation with jacket for each plastic pipe marker to be installed on uninsulated pipes subjected to fluid temperatures of 180° F or greater. Cut length to extend 2" beyond each end of plastic pipe marker.
- D. Adjust size of marker and letters to accommodate the outside diameter, including insulation, of the pipe identified. Follow the guidelines published in ANSI A13.1 for marker/lettering size and color.
- E. Lettering: Include in the submittal the manufacturer's standard preprinted nomenclature which best describes piping system in each instance, for review by the Architect/Engineer.
- F. Arrows: Print each pipe marker with arrows indicating direction of flow, either integrally with piping system service lettering (to accommodate both directions), or as a separate unit of plastic.
- G. Manufacturer: Subject to compliance with requirements, provide Plumbing identification materials of one of the following:
 - 1. Brady (W.H.) Co.; Signmark Div. – Self Sticking Vinyl Pipe Markers
 - 2. Brimar Industries, Inc. – E-Z Pipe Markers
 - 3. Seton Name Plate Corp. – Seton Code

2.2 VALVE TAGS

- A. Provide 19 gage polished brass valve tags with stamp engraved piping system abbreviation in ¼" high letters and sequenced valve numbers ½" high, and with 5/32" hole for fastener.
 - 1. Provide 1½" →2" diameter tags, except as otherwise indicated.
 - 2. Fill tag engraving with black enamel.

2.3 LETTERING AND GRAPHICS

- A. General: Coordinate names, abbreviations and other designations used in plumbing identification work, with corresponding designations shown, specified or scheduled.

Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as required for proper identification and operation/maintenance of plumbing systems and equipment.

PART 3 – EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

- A. Coordination: Where identification is to be applied to surfaces which require insulation, painting or other covering or finish, including valve tags in finished plumbing spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

3.2 PIPING SYSTEM IDENTIFICATION

- A. General: Install pipe markers of the following type on each system indicated to receive identification, and include arrows to show normal direction of flow:
 - 1. Plastic pipe markers, with application system as indicated under "Materials" in this section. Install on pipe insulation segment where required for hot uninsulated pipes. Where additional bands are required to secure the marker to the (insulated) pipe, the band shall completely circumvent the pipe and lap itself by a minimum of 1".
- B. Locate pipe markers and color bands as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch, excluding short takeoffs for fixtures; mark each pipe at branch, where there could be question of flow pattern.
 - 3. Near locations where pipes pass through walls or floors/ ceilings, or enclosures.
 - 4. At access doors, manholes and similar access points that permit view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced intermediately at maximum spacing of 25' along each piping run.

3.3 VALVE IDENTIFICATION

- A. General: Provide a valve tag on every valve, cock and control device in each piping system. Exclude check valves, valves within factory fabricated equipment units, plumbing fixture faucets, interior and exterior hose bibs, shut off valves at plumbing fixtures, and similar rough-in connections of end use fixtures and units. List each tagged valve in the valve schedules for each piping system.

3.4 ADJUSTING AND CLEANING

- A. Adjusting: Relocate any plumbing identification device that has become visually blocked by work of this division or other divisions.

- B. Cleaning: Clean face of identification devices, and glass frames of valve charts.

END OF SECTION 220553