

2/18/2022

**DPH Laboratory Expansion  
Bid Pack – 02  
Addendum 2**

**Contract(s):**

Contract 21-017-A Bid Pack 2..... Concrete  
Contract 21-017-B Bid Pack 2..... Masonry  
Contract 21-017-C Bid Pack 2..... Structural Steel & Misc. Metals  
Contract 21-017-D Bid Pack 2 .....Carpentry, Drywall, & General Work  
Contract 21-017-E Bid Pack 2 .....Millwork & Casework  
Contract 21-017-F Bid Pack 2 .....Siding  
Contract 21-017-G Bid Pack 2 .....Roofing  
Contract 21-017-H Bid Pack 2 .....Aluminum & Glass  
Contract 21-017-I Bid Pack 2 .....Carpet and Resilient Flooring  
Contract 21-017-J Bid Pack 2 .....Tile  
Contract 21-017-K Bid Pack 2 .....Epoxy Flooring  
Contract 21-017-L Bid Pack 2 .....Painting  
Contract 21-017-M Bid Pack 2 .....Cold Rooms  
Contract 21-017-N Bid Pack 2 .....Fire Protection  
Contract 21-017-O Bid Pack 2 .....Plumbing & HVAC  
Contract 21-017-P Bid Pack 2 .....Electrical

**A. Documents**

1. Attached is a revised bid form for the Millwork and Casework package. It adds Alternate 01A Shell Only EPI Wing to the alternate list. Please use this to submit your proposal.
2. The following changes are made to specification 01 12 00 Multiple Contract Summary. Part 2 – Separate Contract Descriptions:
  - a. 5.0.D Millwork & Casework, Scope of Work:
    - i. Add item 22. Provide an allowance of \$5,000 for floor prep to be used only at the direction of the Construction Manager.
    - ii. Delete item 4. Provide minor floor prep and patching
  - b. 9.0.D Carpet & Resilient Flooring, Scope of Work:
    - i. Add item 12. Provide an allowance of \$15,000 for floor prep to be used only at the direction of the Construction Manager.
    - ii. Delete item 4. Provide minor floor prep and patching
3. See attached Bernardon Addendum #2. It includes answers to RFIs 1- 21, specifications, and drawings.



LABORATORY EXPANSION  
DIVISION OF PUBLIC HEALTH  
CONTRACT NO. 21-017

**BID FORM**

**UNIT PRICES**

There are no Unit Prices required for this contract.

**ALLOWANCES**

Contingency Allowances conform to project specification section 01 21 00 - ALLOWANCES. The following Contingency Allowance is to be included in the Base Bid amount. Any unused portion remaining at the end of the project is to be returned to the Owner via Change Order. Refer to the specifications for a complete description of the following Contingency Allowance:

CONTINGENCY ALLOWANCE: Five thousand dollars (\$5,000.00)

LABORATORY EXPANSION  
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**BID FORM**

I/We acknowledge Addendums numbered \_\_\_\_\_ and the price(s) submitted include any cost/schedule impact they may have.

This bid shall remain valid and cannot be withdrawn for thirty (30) days from the date of opening of bids (60 days for School Districts and Department of Education), and the undersigned shall abide by the Bid Security forfeiture provisions. Bid Security is attached to this Bid.

The Owner shall have the right to reject any or all bids, and to waive any informality or irregularity in any bid received.

This bid is based upon work being accomplished by the Sub-Contractors named on the list attached to this bid.

Should I/We be awarded this contract, I/We pledge to achieve substantial completion of all the work within \_\_\_\_\_ calendar days of the Notice to Proceed.

The undersigned represents and warrants that he has complied and shall comply with all requirements of local, state, and national laws; that no legal requirement has been or shall be violated in making or accepting this bid, in awarding the contract to him or in the prosecution of the work required; that the bid is legal and firm; that he has not, directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken action in restraint of free competitive bidding.

Upon receipt of written notice of the acceptance of this Bid, the Bidder shall, within twenty (20) calendar days, execute the agreement in the required form and deliver the Contract Bonds, and Insurance Certificates, required by the Contract Documents.

I am / We are an Individual / a Partnership / a Corporation

By \_\_\_\_\_ Trading as \_\_\_\_\_  
(Individual's / General Partner's / Corporate Name)  
\_\_\_\_\_  
(State of Corporation)

Business Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Witness: \_\_\_\_\_ By: \_\_\_\_\_  
(SEAL) ( Authorized Signature )  
\_\_\_\_\_  
( Title )  
Date: \_\_\_\_\_

**ATTACHMENTS**

- Sub-Contractor List
- Non-Collusion Statement
- Affidavit of Employee Drug Testing Program
- Affidavit of Contractor Qualifications
- Bid Security
- (Others as Required by Project Manuals)

LABORATORY EXPANSION  
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CONTRACT NO. 21-017

**BID FORM**

**SUBCONTRACTOR LIST**

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b of the Delaware Code, the following subcontractor listing must accompany any bid submittal. The bidder must list **in each category** the full name and address (City & State) of the sub-contractor that the bidder will be using to perform the work and provide material for that subcontractor category. Should the bidder's listed subcontractor intend to provide any of their subcontractor category of work through a third-tier contractor, the bidder shall list that third-tier contractor's full name and address (City & State). **If the bidder intends to perform any category of work itself, it must list its full name and address.** For clarification, if the bidder intends to perform the work themselves, the bidder **may not** insert "not applicable", "N/A", "self" or anything other than its own full name and address (City & State). To do so shall cause the bid to be rejected. In addition, the failure to produce a completed subcontractor list with the bid submittal shall cause the bid to be rejected. If you have more than three (3) third-tier contractors to report in any subcontractor category, print out additional page(s) containing the appropriate category, complete the rest of your list of third-tier contractors for that category, notate the addition in parentheses as (CONTINUATION) next to the subcontractor category and an asterisk (\*) next to any additional third-tier contractors, and submit it with your bid.

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City &amp; State)</u>	<u>Subcontractors tax-payer ID # or Delaware Business license #</u>
1.	_____	_____	_____
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____
2	_____	_____	_____
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____

LABORATORY EXPANSION  
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**BID FORM (Continued)**

<u>Subcontractor Category</u>	<u>Subcontractor</u>	<u>Address (City &amp; State)</u>	<u>Subcontractors tax-payer ID # or Delaware Business license #</u>
3.	_____	_____	_____
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____
4.	_____	_____	_____
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____
5.	_____	_____	_____
A.	_____	_____	_____
B.	_____	_____	_____
C.	_____	_____	_____

LABORATORY EXPANSION  
DIVISION OF PUBLIC HEALTH  
CONTRACT NO. 21-017

**BID FORM**  
**NON-COLLUSION STATEMENT**

This is to certify that the undersigned bidder has neither directly nor indirectly, entered into any agreement, participated in any collusion or otherwise taken any action in restraint of free competitive bidding in connection with this proposal submitted this date to the Department of Health and Social Services, Division of Public Health.

All the terms and conditions of Contract Number 20-017 have been thoroughly examined and are understood.

**NAME OF BIDDER:** \_\_\_\_\_

**AUTHORIZED REPRESENTATIVE  
(TYPED):** \_\_\_\_\_

**AUTHORIZED REPRESENTATIVE  
(SIGNATURE):** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**ADDRESS OF BIDDER:** \_\_\_\_\_

\_\_\_\_\_

**E-MAIL:** \_\_\_\_\_

**PHONE NUMBER:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

My Commission expires \_\_\_\_\_ . NOTARY PUBLIC \_\_\_\_\_.

**THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.**

**AFFIDAVIT  
OF  
EMPLOYEE DRUG TESTING PROGRAM**

4104 Regulations for the Drug Testing of Contractor and Subcontractor Employees Working on Large Public Works Projects requires that Contractors and Subcontractors implement a program of mandatory drug testing for Employees who work on Large Public Works Contracts funded all or in part with public funds.

We hereby certify that we have in place or will implement during the entire term of the contract a Mandatory Drug Testing Program for our employees on the jobsite, including subcontractors, that complies with this regulation:

**Contractor/Subcontractor Name:** \_\_\_\_\_

**Contractor/Subcontractor Address:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Authorized Representative (typed or printed):** \_\_\_\_\_

**Authorized Representative (signature):** \_\_\_\_\_

**Title:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_ 20\_\_\_\_.

My Commission expires \_\_\_\_\_ . NOTARY PUBLIC \_\_\_\_\_.

**THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.**



LABORATORY EXPANSION  
DIVISION OF PUBLIC HEALTH  
CONTRACT NO. 21-017

**AFFIDAVIT  
OF  
CONTRACTOR QUALIFICATIONS**

We hereby certify that we will abide by the contractor’s qualifications outlined in the construction bid specifications for the duration of the contract term.

In accordance with Title 29, Chapter 69, Section 6962(d)(10)b.3 of the Delaware Code, after a contract has been awarded the successful bidder shall not substitute another subcontractor whose name was submitted on the Subcontractor Form except for the reasons in the statute and not without written consent from the awarding agency. Failure to utilize the subcontractors on the list will subject the successful bidder to penalties as outlined in the General Requirements Section 5.2 of the contract.

**Contractor Name:** \_\_\_\_\_

**Contractor Address:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Authorized Representative (typed or printed):** \_\_\_\_\_

**Authorized Representative (signature):** \_\_\_\_\_

**Title:** \_\_\_\_\_

Sworn to and Subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

My Commission expires \_\_\_\_\_, NOTARY PUBLIC \_\_\_\_\_.

**THIS PAGE MUST BE SIGNED AND NOTARIZED FOR YOUR BID TO BE CONSIDERED.**

# BERNARDON

ARCHITECTURE  
INTERIOR DESIGN  
LANDSCAPE ARCHITECTURE

## ADDENDUM NO. 2

Project Name: Department of Public Health Lab Expansion – Bid Pack 2

Project No.: DPH #21-017      Bernardon Project No. 8525.00-20

Date of Issue: February 18, 2022

Notice 1:                      Attach this addendum to the Project Manual for this project. It modifies and becomes part of the Bidding Documents. Work or material not specifically mentioned herein is to be as described in the main body of the Project Manual, and as shown on the drawings.

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### Clarifications:

1.      See RFI list with responses attached to this addendum.

### Changes to the Drawings:

1.      Drawing M-100 has been revised and is included in this addendum.

### Changes to the Project Manual:

1.      Specification section 23 21 13 HYDORNIC PIPING has been revised to include Part 2 sub-section 2.03 Chilled Water Piping, Buried. All subsequent Part 2 sub-sections have been renumbered accordingly. Revised specification section in its entirety is included in this addendum.
2.      Specification section 10 22 39 FOLDING PANEL PARTIONS is added and included with this addendum.

End of Addendum No. 2

**Wohlsen Construction**  
**RFI LOG Bid Pack #2**  
**DE Public Health Lab Expansion**  
**30 Sunnyside Road**  
**Smyrna, DE 19977**



Round 1 RFI Nos. 1 -14 Dated 2/10/22

RFI #	Question	Response Round 1
1	Is Seiberlich Trane Energy services acceptable as a controls vendor for this bid with the following: a. Trane Tracer Product Line b. Tridium Niagara Framework Product Line - Lynxspring	<b>Bernardon - to be determined in a subsequent addendum.</b>
2	Please see the attached substitution request from Environmental Growth Chambers for the cold rooms.	<b>Bernardon - to be determined in a subsequent addendum.</b>
3	Please provide specifications for the following items included in the Carpentry Scope: a. Interior code-related signage b. Steel bin units c. Operable partitions d. Ceiling service panels	<b>Bernardon - to be determined in a subsequent addendum.</b> <b>Bernardon - Basis of design is indicated on the drawings as Global Industrial model 330-95 Duram Steel parts bin, item number T97B170174. Approved equals will be evaluated.</b> <b>Bernardon - Spec section provided in Addendum No. 2</b> <b>Bernardon - Basis of design is a panel from Mott Manufacturing, Model number OSP0002, powder coated, 23-3/4" x 23-3/4". The type 2 panel is the same except in a custom configuration.</b>
4	Please confirm that lab sink faucets and vacuum breakers are supplied by the Carpentry, Drywall, and General Work contractor and installed by the Plumbing and HVAC Contractor	<b>Confirmed</b>
5	Is there a COVID vaccination requirement for this project?	<b>No. Be aware that access to the facility currently requires sign in, mask and confirmation of temperature.</b>

**Wohlsen Construction**  
**RFI LOG Bid Pack #2**  
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**Smyrna, DE 19977**



Round 1 RFI Nos. 1 -14 Dated 2/10/22

6	On Drawing G-003, there are Signage General Notes that include Sign Types A – F plus ID. On the Code Plan on that page, there are additional sign types indicated (G, H and I), provide information for these signs.	<b>Bernardon - These signs indicate type of space (G=Lab, H= Office, I=Break/Coffee, J=Training)</b>
7	On the Code Plan, there are at least two signs that are mis-labeled (the restrooms in the new EPI Office Area Addition, which are marked as A rather than C). Also there is a sign at the main entrance that is indicated to be an A but they probably meant it to be a B.	<b>Bernardon - Yes, toilet room sign would be "C". The "A" sign at the entrance would remain since it is and exit, but a "B" sign would also apply as an entrance.</b>
8	Is Altro Flooring Walkway 20 an alternative option from the specified Armstrong Vinyl Corlon? Ref. 130600 Enviromental Rooms, para. 2.6.	<b>Bernardon - Altro Walkway 20 provided the installation is seamless.</b>
9	There is a specification for Sun Control Devices (107113) and Canopies (107316). Our scope of work has us providing an deduct (Alternate #5) for "Sunshades". Will this include both Sun Control Devices and Canopies? If so can we confirm which ones are Sun Control devices and which ones are Canopies?	<b>Bernardon - Alternate #5 identifies specific sun shades (sun control devices) to be deducted from the bid. No canopies are deducted wit this alternate.</b>
10	The ceramic tile section 09 30 13, para. 2.3 is for tile backer boards. Is this to be included as part of the Tile scope or will this be done under the carpentry/drywall contract?	<b>This is to be included as part of the Carpentry, Drywall, and General Work bid package.</b>
11	Confirm Lab casework is not part of the Millwork & Casework bid package	<b>Confirmed. The built-in lab casework is part of the Carpentry, Drywall, and General Work bid package</b>
12	Confirm bullet resistant panels are not part of the Millwork & Casework bid package	<b>Confirmed. The bullet resistant panels are part of the Carpentry, Drywall, and General Work bid package</b>
13	Ref. 1/A-611. Who will be picking up the epoxy lab sills?	<b>The epoxy window sill are part of the Millwork and Casework bid package</b>
14	Ref. 4/A-432 Who will pick up the deal tray in the solid surface?	<b>The deal tray is part of the Aluminum and Glass bid package</b>

**Wohlsen Construction**  
**RFI LOG Bid Pack #2**  
**DE Public Health Lab Expansion**  
**30 Sunnyside Road**  
**Smyrna, DE 19977**



Round 2 RFI Nos. 15-21, Dated 2/15/22

RFI #	Question	Response Round 2
15	For the bid bond, is it required for every bid or just bids over a certain dollar amount?	<b>A bid bond is required for all bids</b>
16	There is a discrepancy between the epoxy flooring system called out in the specs and the one listed on the finish plan. The spec calls for a 1/8" system of the product called out on the drawings, but also calls for the broadcast to be decorative flake. However, on the finish selections of the finish plan, it calls for a 1/8" system from Sika using decorative quartz—not decorative flake for the broadcast. Can you clarify which one should be used	<b>Bernardon - The Sika quartz FX product indicated on the drawings is basis of design. Approved equals can evaluated.</b>
17	For the Millwork and Casework bid package, would the alternate for Shell only on EPI wing would be for the window sills only?	<b>Correct, the rest of the Millwork and Casework Bid Package for the EPI wing would be in the alternate 01B Fitout only EPI Wing</b>
18	Is the subcontractor list for any subs that we are using for the project?	<b>Yes, all subcontractors that you intend to use should be listed</b>
19	We would like to request that Johnson Controls FX N4 Tridium by ModernControls be approved as an acceptable manufacturer / service provider for the 23 09 50 BUILDING AUTOMATION SYSTEM. All the Facility Explorer Programmable/Field Controllers are UL & BACnet BTL compliant. FX utilizes a Tridium JACE open architecture and can interface with the existing BAS. ModernControls is a pre-approved service provider for the State of Delaware	<b>DEDC- Johnson Controls FX N4 Tridium by Modern Controls is acceptable for this project.</b>
20	We are requesting to use an alternate system for Alternate 02 to clean and seal the existing tile in the 2 locker rooms. We are asking if we can use the MicroGuard AD1000 system in lieu of the Saniglaze system. <a href="https://www.mymicroguard.com/products/all-in-one/">https://www.mymicroguard.com/products/all-in-one/</a>	<b>Bernardon - Microguard AD1000 system an acceptable substitute .</b>
21	Request for FULTON to be added as an acceptable Manufacturer for Condensing Boilers, Specifications Section 235216 – Condensing Boilers, Part 2 Products, 2.01 Manufacturers	<b>DEDC - Fulton Boilers are an acceptable substitution. The contractor shall be responsible for coordinating and providing any differences in electric requirements, pad requirements, venting requirements, etc.</b>

## **SECTION 23 21 13 - HYDRONIC PIPING**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Hydronic system requirements.
- B. Heating water piping, above grade.
- C. Chilled water piping, buried.
- D. Chilled water piping, above grade.
- E. Pipe and pipe fittings for:
  - 1. Heating water piping system.
  - 2. Chilled water piping system.
  - 3. Equipment drains and overflows.
- F. Pipe hangers and supports.
- G. Unions, flanges, and dielectric connections.
- H. Valves:
  - 1. Ball valves.
  - 2. Manual Calibrated Balancing Valves
  - 3. Butterfly valves.
  - 4. Check valves.

#### **1.02 RELATED REQUIREMENTS**

- A. Section 23 05 48 - Vibration and Seismic Controls for HVAC Piping and Equipment.
- B. Section 23 05 53 - Identification for HVAC Piping and Equipment.
- C. Section 23 07 19 - HVAC Piping Insulation.
- D. Section 23 21 14 - Hydronic Specialties.
- E. Section 23 25 00 - HVAC Water Treatment: Pipe cleaning.

#### **1.03 REFERENCE STANDARDS**

- A. ASME BPVC-IX - Boiler and Pressure Vessel Code, Section IX - Welding, Brazing, and Fusing Qualifications; 2015.
- B. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings; 2012.
- C. ASME B16.22 - Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings; 2013.
- D. ASME B31.9 - Building Services Piping; 2014.
- E. ASME B16.22 - Wrought Copper and Copper Alloy Solder Joint Pressure Fittings; The American Society of Mechanical Engineers; 2001 (R2005).
- F. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; 2008 (ANSI/ASME B31.9).
- G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.
- H. ASTM A234/A234M - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service; 2015.
- I. ASTM B32 - Standard Specification for Solder Metal; 2008 (Reapproved 2014).
- J. ASTM B88 - Standard Specification for Seamless Copper Water Tube; 2014.
- K. ASTM B88M - Standard Specification for Seamless Copper Water Tube (Metric); 2013.
- L. ASTM D1785 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120; 2015.
- M. ASTM D2241 - Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series); 2015.

- N. ASTM D2466 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40; 2013.
- O. ASTM D2467 - Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80; 2006.
- P. ASTM D2855 - Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings; 1996 (Reapproved 2010).
- Q. ASTM F708 - Standard Practice for Design and Installation of Rigid Pipe Hangers; 1992 (Reapproved 2008).
- R. AWS A5.8M/A5.8 - Specification for Filler Metals for Brazing and Braze Welding; 2011-AMD 1.
- S. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2015.
- T. MSS SP-58 - Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation; 2009.

#### **1.04 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Include data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalogue information. Indicate valve data and ratings.
- C. Welders Certificate: Include welders certification of compliance with ASME BPVC-IX.
- D. Product Data:
  - 1. Include data on pipe materials, pipe fittings, valves, and accessories.
  - 2. Provide manufacturers catalogue information.
  - 3. Indicate valve data and ratings.
- E. Manufacturer's Installation Instructions: Indicate hanging and support methods, joining procedures.
- F. Project Record Documents: Record actual locations of valves.
- G. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

#### **1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.
- B. Welder Qualifications: Certify in accordance with ASME BPVC-IX.
  - 1. Provide certificate of compliance from authority having jurisdiction, indicating approval of welders.

#### **1.06 DELIVERY, STORAGE, AND HANDLING**

- A. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- B. Provide temporary protective coating on cast iron and steel valves.
- C. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- D. Protect piping systems from entry of foreign materials by temporary covers, completing sections of the work, and isolating parts of completed system.

### **PART 2 PRODUCTS**

#### **2.01 HYDRONIC SYSTEM REQUIREMENTS**

- A. Comply with ASME B31.9 and applicable federal, state, and local regulations.
- B. Piping: Provide piping, fittings, hangers and supports as required, as indicated, and as follows:
  - 1. Where more than one piping system material is specified, provide joining fittings that are compatible with piping materials and ensure that the integrity of the system is not jeopardized.

2. Use non-conducting dielectric connections whenever jointing dissimilar metals. Provide shut off valve to allow for replacement of the fitting without draining the entire system. The shut off valve shall be constructed of the material matching the pipe it's on.
  3. Grooved mechanical joints are not permitted in any location.
  4. Provide pipe hangers and supports in accordance with ASME B31.9 or MSS SP-58 unless indicated otherwise.
- C. Pipe-to-Valve and Pipe-to-Equipment Connections: Use flanges or unions to allow disconnection of components for servicing; do not use direct welded, soldered, or threaded connections.
- D. Valves: Provide valves where indicated:
1. Provide drain valves where indicated, and if not indicated provide at least at main shut-off, low points of piping, bases of vertical risers, and at equipment. Use 3/4 inch gate valves with cap; pipe to nearest floor drain.
  2. Isolate equipment using butterfly valves with lug end flanges or grooved mechanical couplings.
  3. For throttling, bypass, or manual flow control services, use globe valves.
  4. For throttling and isolation service in chilled and condenser water systems, use only butterfly valves.
  5. In heating water or chilled water systems, butterfly valves may be used interchangeably with gate and globe valves unless indicated otherwise.
  6. For shut-off and to isolate parts of systems or vertical risers, use gate, ball, or butterfly valves unless indicated otherwise.
- E. Welding Materials and Procedures: Conform to ASME BPVC-IX.

## **2.02 HEATING WATER PIPING, ABOVE GRADE**

- A. The intent is to provide Copper Tube up to 2" and Steel piping for larger than 2". However we would like to minimize the change in materials therefore, should a condition be found that maintaining one piping material for a short length in a size not listed for that material would reduce the amount of dielectric fittings, this condition shall be presented to the engineer for review.
- B. Steel Pipe: ASTM A53/A53M, Schedule 40, black, using one of the following joint types:
1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D1.1/D1.1M welded.
- C. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn, using one of the following joint types:
1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings.
    - a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
    - b. Braze: AWS A5.8M/A5.8 BCuP copper/silver alloy.
  2. Tee Connections: Mechanically extracted collars with notched and dimpled branch tube.
  3. Mechanical Press Sealed Fittings: Double pressed type complying with ASME B16.22, utilizing EPDM, nontoxic synthetic rubber sealing elements.
    - a. Manufacturers:
      - 1) Grinnell Products, a Tyco Business: [www.grinnell.com](http://www.grinnell.com).
      - 2) Viega LLC: [www.viega.com](http://www.viega.com).
      - 3) Substitutions: See Section 01 60 00 - Product Requirements.

## **2.03 CHILLED WATER PIPING, BURIED**

- A. PIPE AND PIPING PRODUCTS
1. Pipe shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389 or CSA B137.11. The pipe shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipe shall be made in a three layer extrusion process. Hydronic hot water and heating piping shall contain a fiber



layer (faser) to restrict thermal expansion. All pipe shall comply with the rated pressure requirements of ASTM F 2389 or CSA 8137.11. All pipe shall be certified by NSF International as complying with NSF 14, and ASTM F 2389 or CSA B137.11

2. Pipe shall be Aquatherm® Climatherm® or Climatherm® Faser®, available from Aquatherm, Inc. or pre-approved equal.

**B. FITTINGS**

1. Fittings shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The fittings shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All fittings shall be certified by NSF International as complying with NSF 14, and ASTM F 2389 or CSA B137.11.
2. Polypropylene Fittings: socket fusion, butt fusion, electrofusion, or fusion outlet fittings shall be used for fusion weld joints between pipe and fittings.
3. Mechanical fittings and transition fittings shall be used where transitions are made to other piping materials or to valves and appurtenances.
4. Polypropylene pipe shall not be threaded. Threaded transition fittings per ASTM F 2389 shall be used where a threaded connection is required.
5. Plastic-to-Metal Transition Fittings shall be the following:
  - a. PP-R one-piece fitting with threaded stainless steel, brass, or copper insert and one PP-R fusion weld joint end.

**C. WARRANTY**

1. Manufacturer shall warrant pipe and fittings for 10 years to be free of defects in materials or workmanship.
2. Warranty shall cover labor and material costs of repairing and/or replacing defective materials and repairing any incidental damage caused by failure of the piping system due to defects in materials or workmanship.

**D. VALVES**

1. Valves shall be manufactured in accordance with the manufacturer's specifications and shall comply with the performance requirements of ASTM F 2389 or CSA BI 37.11. The valves shall contain no rework or recycled thermoplastic materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

**E. SMOKE AND FIRE RATINGS**

1. Where indicated on the drawings that a Plenum-rated Piping System is needed, then the pipe shall be wrapped and/or insulated with standard pipe insulation, field installed. The pipe wrap or insulation shall meet the requirements of CAN/ULC-SI02.2-03 or ASTM E84. The system shall have a Flame Spread Classification of less than 25 and Smoke Development rating of less than 50.

**F. UV PROTECTION**

1. Where indicated on the drawings that the pipe will be exposed to direct UV light for more than 30 days, it shall be provided with a Factory applied, UV-resistant coating or alternative UV protection.

**G. THERMAL AND VAPOR BARRIER**

1. A. Where standard pipe insulation is indicated on the drawings or in these specifications, the contractor shall provide a thermal (radiant, conductive, and convective) and vapor barrier insulation. The insulation products shall be provided in 6R-value and 1.5" thickness or as indicated on the drawings or elsewhere in these specifications. The standard pipe insulation shall be UV resistant, CFC-free, non-porous, non-fibrous, and resist mold growth. The pipe with the insulation shall meet the ASTM E84 and the CAN/ULC SI02.2 requirements for a Flame Spread Rating of 25 and Smoke Development rating of 50.

**2.04 CHILLED WATER PIPING, ABOVE GRADE**

- A. The intent is to provide Copper Tube up to 2" and Steel piping for larger than 2". However we would like to minimize the change in materials therefore, should a condition be found that

maintaining one piping material for a short length in a size not listed for that material would reduce the amount of dielectric fittings, this condition shall be presented to the engineer for review.

- B. Steel Pipe: ASTM A53/A53M, Schedule 40, black; using one of the following joint types:
  - 1. Welded Joints: ASTM A234/A234M, wrought steel welding type fittings; AWS D1.1/D1.1M welded.
- C. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), hard drawn; using one of the following joint types:
  - 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22, solder wrought copper fittings.
    - a. Solder: ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.
  - 2. Tee Connections: Mechanically extracted collars with notched and dimpled branch tube.
  - 3. Mechanical Press Sealed Fittings: Double pressed type complying with ASME B16.22, utilizing EPDM, nontoxic synthetic rubber sealing elements.
    - a. Manufacturers:
      - 1) Grinnell Products, a Tyco Business: [www.grinnell.com](http://www.grinnell.com).
      - 2) Viega LLC: [www.viega.com](http://www.viega.com).
      - 3) Substitutions: See Section 01 60 00 - Product Requirements.

## **2.05 EQUIPMENT DRAINS AND OVERFLOWS**

- A. Copper Tube: ASTM B88 (ASTM B88M), Type K (A), drawn; using one of the following joint types:
  - 1. Solder Joints: ASME B16.18 cast brass/bronze or ASME B16.22 solder wrought copper fittings; ASTM B32 lead-free solder, HB alloy (95-5 tin-antimony) or tin and silver.

## **2.06 PIPE HANGERS AND SUPPORTS**

- A. Provide hangers and supports that comply with MSS SP-58.
  - 1. If type of hanger or support for a particular situation is not indicated, select appropriate type using MSS SP-58 recommendations.
- B. Conform to ASME B31.9.
- C. Hangers for Pipe Sizes 1/2 to 1-1/2 Inch: Malleable iron, adjustable swivel, split ring.
- D. Hangers for Cold Pipe Sizes 2 Inches and Greater: Carbon steel, adjustable, clevis.
- E. Hangers for Hot Pipe Sizes 2 to 4 Inches: Carbon steel, adjustable, clevis.
- F. Hangers for Hot Pipe Sizes 6 Inches and Greater: Adjustable steel yoke, cast iron roll, double hanger.
- G. Multiple or Trapeze Hangers: Steel channels with welded spacers and hanger rods.
- H. Wall Support for Pipe Sizes to 3 Inches: Cast iron hook.
- I. Wall Support for Pipe Sizes 4 Inches and Greater: Welded steel bracket and wrought steel clamp.
- J. Vertical Support: Steel riser clamp.
- K. Hanger Rods: Mild steel threaded both ends, threaded one end, or continuous threaded.

## **2.07 UNIONS, FLANGES, AND DIELECTRIC CONNECTIONS**

- A. Unions for Pipe 2 Inches and Less:
  - 1. Ferrous Piping: 150 psig malleable iron, threaded.
  - 2. Copper Pipe: Bronze, soldered joints.
- B. Flanges for Pipe 2 Inches and Greater:
  - 1. Ferrous Piping: 150 psig forged steel, slip-on.
  - 2. Gaskets: 1/16 inch thick preformed neoprene.
- C. Dielectric Connections:
  - 1. Waterways:

- a. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
  - b. Dry insulation barrier able to withstand 600 volt breakdown test.
  - c. Construct of galvanized steel with threaded end connections to match connecting piping.
  - d. Suitable for the required operating pressures and temperatures.
2. Flanges:
- a. Dielectric flanges with same pressure ratings as standard flanges.
  - b. Water impervious insulation barrier capable of limiting galvanic current to 1 percent of short circuit current in a corresponding bimetallic joint.
  - c. Dry insulation barrier able to withstand 600 volt breakdown test.
  - d. Construct of galvanized steel with threaded end connections to match connecting piping.
  - e. Suitable for the required operating pressures and temperatures.

## **2.08 GATE VALVES**

- A. Manufacturers:
1. Tyco Flow Control: [www.tycoflowcontrol.com](http://www.tycoflowcontrol.com).
  2. Milwaukee Valve Company: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).

## **2.09 GLOBE OR ANGLE VALVES**

- A. Manufacturers:
1. Tyco Flow Control: [www.tycoflowcontrol.com](http://www.tycoflowcontrol.com).
  2. Milwaukee Valve Company: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).
- B. Up To and Including 2 Inches:
1. Balancing ports and caps must be provided with globe or angle valves used for balancing.
- C. Over 2 Inches:
1. Balancing ports and caps must be provided with globe or angle valves used for balancing.

## **2.10 BALL VALVES**

- A. Manufacturers:
1. Tyco Flow Control: [www.tycoflowcontrol.com](http://www.tycoflowcontrol.com).
  2. Milwaukee Valve Company: [www.milwaukeevalve.com](http://www.milwaukeevalve.com).
- B. Up To and Including 2 Inches:
1. Bronze one piece body, chrome plated brass ball, teflon seats and stuffing box ring, lever handle with balancing stops, solder ends with union.

## **2.11 MANUAL CALIBRATED BALANCING VALVES**

- A. Valve Characteristics ½" to 2" "Y" Pattern Globe
1. 300 psi/2065 kPa, y-pattern, globe type with soldered or threaded ends, non-ferrous Ametal® brass copper alloy body, EPDM o-ring seals. 4-turn digital readout handwheel for balancing, hidden memory feature with locking tamper-proof setting, and connections for portable differential meter. Tour and Andersson TA Series 786-STAS or 787-STAD or equal by Armstrong or Wheatley.
- B. Valve Characteristics 2 ½ to 16" "Y" Pattern Globe
1. 300 psi/2065 kPa, y-pattern, globe type with flanged or grooved ends, ASTM A536 ductile iron body, all other metal parts of Ametal® brass copper alloy, EPDM O-ring seals. 8, 12, 16, 20 or 22 turn digital readout handwheel for balancing, hidden memory feature with locking tamper-proof setting, and connections for portable differential meter. Tour and Andersson TA Series 788-STAF or 789-STAG or equal by Armstrong or Wheatley.
- C. Balancing Meter
1. A balancing meter is required to be left with the owner after commissioning, the balancing meter shall be from the same provider as the balancing valves, Victaulic. The Series 734 TA-Scope, or TA Series 73M CMI Pressure Differential Meter are acceptable and are

manufactured by Tour and Andersson and provided by Victaulic. Needle gauge type meters will not be allowed.

## **2.12 BUTTERFLY VALVES**

- A. Manufacturers:
  - 1. Tyco Flow Control: [www.tycoflowcontrol.com](http://www.tycoflowcontrol.com).
  - 2. Hammond Valve: [www.hammondvalve.com](http://www.hammondvalve.com).
- B. Body: Cast or ductile iron with resilient replaceable EPDM seat, wafer, lug, or grooved ends, extended neck.
- C. Disc: Construct of aluminum bronze, chrome plated ductile iron, or stainless steel.
- D. Operator: Infinite position lever handle with memory stop.

## **2.13 SPRING LOADED CHECK VALVES**

- A. Manufacturers:
  - 1. Tyco Flow Control: [www.tycoflowcontrol.com](http://www.tycoflowcontrol.com).
  - 2. Crane Co.: [www.cranevalve.com](http://www.cranevalve.com).
- B. Iron body, bronze trim, split plate, hinged with stainless steel spring, resilient seal bonded to body, wafer or threaded lug ends.

## **PART 3 EXECUTION**

### **3.01 PREPARATION**

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt on inside and outside before assembly.
- C. Prepare piping connections to equipment using jointing system specified.
- D. Keep open ends of pipe free from scale and dirt. Protect open ends with temporary plugs or caps.
- E. After completion, fill, clean, and treat systems. Refer to Section 23 25 00 for additional requirements.

### **3.02 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Route piping in orderly manner, parallel to building structure, and maintain gradient.
- C. Provide valve extensions to ensure valve handles extend past piping insulation.
- D. Install piping to conserve building space and to avoid interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Sleeve pipe passing through partitions, walls and floors.
- G. Slope piping and arrange to drain at low points.
- H. Pipe Hangers and Supports:
  - 1. Install in accordance with ASME B31.9, ASTM F708, or MSS SP-58.
  - 2. Support horizontal piping as scheduled.
  - 3. Install hangers to provide minimum 1/2 inch space between finished covering and adjacent work.
  - 4. Place hangers within 12 inches of each horizontal elbow.
  - 5. Use hangers with 1-1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
  - 6. Support vertical piping at every other floor. Support riser piping independently of connected horizontal piping.
  - 7. Where several pipes can be installed in parallel and at same elevation, provide multiple or trapeze hangers.

8. Prime coat exposed steel hangers and supports. Refer to Section 09 91 23. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
- I. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings. Refer to Section 23 07 19.
- J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welds.
- K. Install valves with stems upright or horizontal, not inverted.

### **3.03 SCHEDULES**

- A. Hanger Spacing for Copper Tubing.
  1. 1/2 inch and 3/4 inch: Maximum span, 5 feet; minimum rod size, 1/4 inch.
  2. 1 inch: Maximum span, 6 feet; minimum rod size, 1/4 inch.
  3. 1-1/2 inch and 2 inch: Maximum span, 8 feet; minimum rod size, 3/8 inch.
- B. Hanger Spacing for Steel Piping.
  1. 2-1/2 inches: Maximum span, 11 feet; minimum rod size, 3/8 inch.
  2. 3 inches: Maximum span, 12 feet; minimum rod size, 3/8 inch.
  3. 4 inches: Maximum span, 14 feet; minimum rod size, 1/2 inch.
  4. 6 inches: Maximum span, 17 feet; minimum rod size, 1/2 inch.
  5. 8 inches: Maximum span, 19 feet; minimum rod size, 5/8 inch.
  6. 10 inches: Maximum span, 20 feet; minimum rod size, 3/4 inch.
  7. 12 inches: Maximum span, 23 feet; minimum rod size, 7/8 inch.
- C. Hanger Spacing for Plastic Piping.
  1. 2 Inches: Maximum span, 69 inches; minimum rod size, 3/8 inch.
  2. 3 Inches: Maximum span, 7 feet; minimum rod size, 3/8 inch.
  3. 4 Inches: Maximum span, 8 feet; minimum rod size, 1/2 inch.
  4. 6 Inches: Maximum span, 10 feet; minimum rod size, 1/2 inch.
  5. 8 Inches: Maximum span, 11 feet; minimum rod size, 5/8 inch.

**END OF SECTION**



## SECTION 102239 - FOLDING PANEL PARTITIONS

### 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 SUMMARY

- A. Section Includes:
  - 1. Manually operated, acoustical panel partitions.

#### 1.3 DEFINITIONS

- A. NIC: Noise Isolation Class.
- B. NRC: Noise Reduction Coefficient.
- C. STC: Sound Transmission Class.

#### 1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site**.

#### 1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For operable panel partitions.
  - 1. Include plans, elevations, sections and attachment details.
  - 2. Indicate stacking and operating clearances. Indicate location and installation requirements for hardware and track, blocking, and direction of travel.
- C. Samples for Initial Selection: For each type of exposed material, finish, covering, or facing.
  - 1. Include Samples of accessories involving color selection.
- D. Samples for Verification: For each type of exposed material, finish, covering, or facing, prepared on Samples of size indicated below:

1. Panel Facing Material: Manufacturer's standard-size unit, not less than 24 inches square.
  2. Panel Edge Material: Not less than 3 inches (75 mm) long.
  3. Chair Rail: Manufacturer's standard-size unit, 6 inches (150 mm) long.
  4. Hardware: One of each exposed door-operating device.
- E. Delegated-Design Submittal: For operable panel partitions.
1. Include design calculations for seismic restraints that brace tracks to structure above.

## 1.6 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Reflected ceiling plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
1. Partition track, track supports and bracing, switches, turning space, and storage layout.
  2. Suspended ceiling components.
  3. Structural members to which suspension systems will be attached.
  4. Size and location of initial access modules for acoustical tile.
  5. Items penetrating finished ceiling including the following:
    - a. Lighting fixtures.
    - b. HVAC ductwork, outlets, and inlets.
    - c. Speakers.
    - d. Sprinklers.
    - e. Smoke detectors.
    - f. Access panels.
  6. Plenum **acoustical** barriers.
- B. Qualification Data: For **Installer**.
- C. Seismic Qualification Certificates: For operable panel partitions, tracks, accessories, and components, from manufacturer. Include seismic capacity of partition assemblies to remain in vertical position during a seismic event and the following:
1. Basis for Certification: Indicate whether certification is based on analysis, testing, or experience data, according to ASCE/SEI 7.
  2. Detailed description of partition anchorage devices on which the certification is based and their installation requirements.
- D. Product Certificates: For each type of operable panel partition.
- E. Product Test Reports: For each operable panel partition, for tests performed by a qualified testing agency.
- F. Sample Warranty: For manufacturer's special warranty.



1.7 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For operable panel partitions to include in maintenance manuals.
  - 1. In addition to items specified in Section 017823 "Operation and Maintenance Data," include the following:
    - a. Panel finish facings and finishes for exposed trim and accessories. Include precautions for cleaning materials and methods that could be detrimental to finishes and performance.
    - b. Seals, hardware, track, track switches, carriers, and other operating components.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials, from the same production run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Panel Finish-Facing Material: Furnish full width in quantity to cover both sides of two panels when installed.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Protectively package and sequence panels in order for installation. Clearly mark packages and panels with numbering system used on Shop Drawings. Do not use permanent markings on panels.

1.11 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of operable panel partitions that fail in materials or workmanship within specified warranty period.
  - 1. Failures include, but are not limited to, the following:
    - a. Faulty operation of operable panel partitions.
    - b. Deterioration of metals, metal finishes, and other materials beyond normal use.
  - 2. Warranty Period: **Three** years from date of Substantial Completion.

## PART 2 - PRODUCTS

### 2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design seismic bracing of tracks to structure above..
- B. Seismic Performance: Operable panel partitions shall withstand the effects of earthquake motions determined according to **ASCE/SEI 7**.
  - 1. The term "withstand" means "the partition panels will remain in place without separation of any parts when subjected to the seismic forces specified."
- C. Acoustical Performance: Provide operable panel partitions tested by a qualified testing agency for the following acoustical properties according to test methods indicated:
  - 1. Sound-Transmission Requirements: Operable panel partition assembly tested for laboratory sound-transmission loss performance according to ASTM E90, determined by ASTM E413, and rated for not less than the STC indicated .
  - 2. Noise-Reduction Requirements: Operable panel partition assembly, identical to partition tested for STC, tested for sound-absorption performance according to ASTM C423, and rated for not less than the NRC indicated.
  - 3. Noise-Isolation Requirements: Installed operable panel partition assembly, identical to partition tested for STC, tested for NIC according to ASTM E336, determined by ASTM E413, and rated for **10 dB less than STC value indicated**.
- D. Fire-Test-Response Characteristics: Provide panels with finishes complying with one of the following as determined by testing identical products by a testing and inspecting agency acceptable to authorities having jurisdiction:
  - 1. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
    - a. Flame-Spread Index: **25** or less.
    - b. Smoke-Developed Index: **450** or less.
  - 2. Fire Growth Contribution: Complying with acceptance criteria of local code and authorities having jurisdiction when tested according to **NFPA 265 Method B Protocol or NFPA 286**.

### 2.2 OPERABLE ACOUSTICAL PANELS – FP-1

- A. Operable Acoustical Panels: Partition system, including panels, seals, finish facing, suspension system, operators, and accessories. Basis of Design shall be Modernfold Acousti-seal Encore 932.

1. **Manufacturers:** Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. [Hufcor, Inc.](#)
  - b. [Moderco Inc.](#)
  - c. [Modernfold, Inc.](#)
- B. Panel Operation: **Manually operated, paired panels.**
- C. Panel Construction: As required to support panel from suspension components and with reinforcement for hardware attachment. Fabricate panels with tight hairline joints and concealed fasteners. Fabricate panels so finished in-place partition is rigid; level; plumb; aligned, with tight joints and uniform appearance; and free of bow, warp, twist, deformation, and surface and finish irregularities.
- D. Dimensions: Fabricate operable acoustical panel partitions to form an assembled system of dimensions indicated and verified by field measurements.
  1. Panel Width: **Standard widths.**
- E. STC: Not less than **56**.
- F. NRC: Not less than **0.50**.
- G. Panel Weight: **10 lb/sq. ft. (50 kg/sq. m)** maximum.
- H. Panel Thickness: **Minimum 3 inches (75 mm).**
  1. Steel Frame: Steel sheet, **manufacturer's standard** nominal minimum thickness for uncoated steel.
  2. Steel Face/Liner Sheets: Tension-leveled steel sheet, **manufacturer's standard** minimum nominal thickness for uncoated steel.
  3. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use, corrosion resistance, and finish indicated; **ASTM B221 (ASTM B221M)** for extrusions; manufacturer's standard strengths and thicknesses for type of use.
    - a. Frame Reinforcement: Manufacturer's standard steel or aluminum.
  4. Gypsum Board: ASTM C1396/C1396M.
  5. Cement Board: ASTM C1288.
  6. Particleboard: ANSI A208.1.
  7. Medium-Density Fiberboard: ANSI A208.2.
  8. Plywood: DOC PS 1.
- I. Panel Closure: Manufacturer's standard unless otherwise indicated.
- J. Hardware: Manufacturer's standard as required to operate operable panel partition and accessories; with decorative, protective finish.

1. Hinges: **Manufacturer's standard.**

K. Finish Facing: **Vinyl-coated fabric wall covering.**

## 2.3 SEALS

A. Description: Seals that produce operable panel partitions complying with performance requirements and the following:

1. Manufacturer's standard seals unless otherwise indicated.
2. Seals made from materials and in profiles that minimize sound leakage.
3. Seals fitting tight at contact surfaces and sealing continuously between adjacent panels and between operable panel partition perimeter and adjacent surfaces, when operable panel partition is extended and closed.
4. Automatically Operated for Acoustical Panels: Extension and retraction of bottom seal automatically operated by movement of partition.

## 2.4 PANEL FINISH FACINGS

A. Description: Finish facings for panels that comply with indicated fire-test-response characteristics and that are factory applied to operable panel partitions with appropriate backing, using mildew-resistant nonstaining adhesive as recommended by facing manufacturer's written instructions.

1. Apply one-piece, seamless facings free of air bubbles, wrinkles, blisters, and other defects, with edges tightly butted, and with invisible seams complying with Shop Drawings for location, and with no gaps or overlaps. Horizontal seams are not permitted. Tightly secure and conceal raw and selvage edges of facing for finished appearance.
2. Where facings with directional or repeating patterns or directional weave or directional, repeating, or matching grain are indicated, mark facing top and attach facing in same direction.

B. Vinyl-Coated Fabric Wall Covering: Manufacturer's standard, mildew-resistant, washable, vinyl-coated fabric wall covering; complying with WA-101, **Type III-Heavy Duty**; Class A.

1. Total Weight: min 30oz per lineal yard.
2. Antimicrobial Treatment: Additives capable of inhibiting growth of bacteria, fungi, and yeasts.

C. Cap-Trimmed Edges: Protective perimeter-edge trim with tight hairline joints concealing edges of panel and finish facing, finished as follows:

1. Steel, Painted: Finished with manufacturer's **color as selected by Architect from manufacturer's full range.**

- D. Trimless Edges: Fabricate exposed panel edges so finish facing wraps uninterrupted around panel, covering edge and resulting in an installed partition with facing visible on vertical panel edges, without trim, for minimal sightlines at panel-to-panel joints.

## 2.5 SUSPENSION SYSTEMS

- A. Tracks: Steel or aluminum **mounted directly to overhead structural support**, designed for operation, size, and weight of operable panel partition indicated. Size track to support partition operation and storage without damage to suspension system, operable panel partitions, or adjacent construction. Limit track deflection to no more than **0.10 inch (2.54 mm)** between bracket supports. Provide a continuous system of track sections and accessories to accommodate configuration and layout indicated for partition operation and storage.
  - 1. Panel Guide: Aluminum guide on both sides of the track to facilitate straightening of the panels; finished with factory-applied, decorative, protective finish.
  - 2. Head Closure Trim: As required for acoustical performance; **with factory-applied, decorative, protective finish.**
- B. Carriers: Trolley system as required for configuration type, size, and weight of partition and for easy operation; with ball-bearing wheels.
- C. Aluminum Finish: Mill finish or manufacturer's standard, factory-applied, decorative finish unless otherwise indicated.
- D. Steel Finish: Manufacturer's standard, factory-applied, corrosion-resistant, protective coating unless otherwise indicated.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine flooring, floor levelness, structural support, and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable panel partitions.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

- A. Install operable panel partitions and accessories after other finishing operations, including painting, have been completed in area of partition installation.
- B. Install panels in numbered sequence indicated on Shop Drawings.
- C. Broken, cracked, chipped, deformed, or unmatched panels are not acceptable.

- D. Broken, cracked, deformed, or unmatched gasketing or gasketing with gaps at butted ends is not acceptable.
- E. Light-Leakage Test: Illuminate one side of partition installation and observe vertical joints and top and bottom seals for voids. Adjust partitions for alignment and full closure of vertical joints and full closure along top and bottom seals. **Perform test and make adjustments before NIC testing.**

### 3.3 FIELD QUALITY CONTROL

- A. NIC Testing: **Engage** a qualified testing agency to perform tests and inspections.
  - 1. Testing Extent: Testing agency shall select all operable panel partition installation(s) for testing.
  - 2. Testing Methodology: Perform testing of installed operable panel partition for noise isolation according to ASTM E336, determined by ASTM E413, and rated for not less than NIC indicated. Adjust and fit partitions to comply with NIC test method requirements.
- B. An operable panel partition installation will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

### 3.4 ADJUSTING

- A. Adjust operable panel partitions, hardware, and other moving parts to function smoothly, and lubricate as recommended by manufacturer.
- B. Verify that safety devices are properly functioning.

### 3.5 MAINTENANCE SERVICE

- A. Maintenance Service: Beginning at Substantial Completion, maintenance service shall include **12 months'** full maintenance by manufacturer's authorized service representative. Include quarterly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operable-partition operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

### 3.6 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain operable panel partitions.

END OF SECTION 102239