



FLORIDA DEPARTMENT OF VETERANS' AFFAIRS

*Honoring those who served U.S.*

**STATE OF FLORIDA  
DEPARTMENT OF VETERANS' AFFAIRS**

**INVITATION TO BID (ITB)**

**FDVA-ITB-20-016B  
"FLUID COOLER REPLACEMENT"**

**SUBMIT ALL INQUIRIES IN WRITING TO:**

**RODRIGO PASION, FCCM  
PURCHASING SPECIALIST  
FLORIDA DEPARTMENT OF VETERANS' AFFAIRS  
MARY GRIZZLE STATE OFFICE BUILDING  
11351 ULMERTON ROAD, SUITE 311-K  
LARGO, FLORIDA 33778-1630**

**EMAIL: [PURCHASINGLARGO@FDVA.STATE.FL.US](mailto:PURCHASINGLARGO@FDVA.STATE.FL.US)**



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**SECTION 'I'**  
**INTRODUCTION**

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**1. Issuing Office.**

a) The sole points of contact with the Florida Department of Veterans' Affairs (FDVA), for purposes of this solicitation, are the Contracting Administrator or Purchasing Officer as identified below:

Primary Contact	Alternate Contact
Rodrigo Pasion, FCCM Purchasing Specialist Mary Grizzle State Office Building Florida Department of Veterans' Affairs 11351 Ulmerton Road, Suite 311-K Largo, FL 33778-1630 Telephone: (727) 518-3202, Ext. 5558 E-mail: <a href="mailto:PurchasingLargo@FDVA.STATE.FL.US">PurchasingLargo@FDVA.STATE.FL.US</a>	Scott Gerke, CPPB, CPPO, FCCM, FCCN Purchasing Officer Mary Grizzle State Office Building Florida Department of Veterans' Affairs 11351 Ulmerton Road, Suite 311-K Largo, FL 33778-1630 Telephone: (727) 518-3202, Ext. 5557 E-mail: <a href="mailto:PurchasingLargo@FDVA.STATE.FL.US">PurchasingLargo@FDVA.STATE.FL.US</a>

b) Respondents to this solicitation or persons acting on their behalf may not contact, between the release of the solicitation and the end of the 72-hour period following the agency posting the notice of intended award, excluding Saturdays, Sundays, and state holidays, any employee or officer of the executive or legislative branch concerning any aspect of this solicitation, except in writing to the procurement officer or as provided in the solicitation documents. Violation of this provision may be grounds for rejecting a response. FDVA shall not be bound by any information from whatever source that is not expressly contained within this solicitation and any issued addendum.

**2. Purpose and Scope.** FDVA invites interested Contractors to submit bids in accordance with this solicitation. The purpose of this solicitation is to establish an Agreement for Contractor provision of all vehicles, trailers, storage containers, dumpsters, labor, services, equipment, tools, materials, parts, and supplies required for the replacement of two (2) HVAC Cooling Towers for the Condensed Water Loop for the Baldomero Lopez State Veterans' Nursing Home, located at 6919 Parkway Blvd. Land O' Lakes, FL 34639. For further details, see Section III "Statement of Work".

FDVA anticipates that the Agreement shall commence on Monday, March 16<sup>th</sup>, 2020, with no renewals. FDVA requires specified services to be completed to the full satisfaction and acceptance of FDVA and any applicable authorities having jurisdiction, within one-hundred-sixty calendar days (160) from the date of Agreement's full execution.

**3. Mandatory Pre-Bid Meeting and On-Site Visit.** A mandatory pre-bid meeting and on-site visit will be held at the location, date, and time specified below. Contractor failure to attend this mandatory pre-bid meeting and on-site visit shall disqualify Contractor from submitting a bid and any consideration. This opportunity allows Contractors to tour the site, ask questions, and seek clarifications about this solicitation. Drawings will be available at the mandatory pre-bid meeting and on-site visit. FDVA may

answer questions at the mandatory pre-bid meeting and on-site visit or defer them to a later date as identified in the Timeline below.

This will be the only on-site visit conducted and allowed for this solicitation. Contractors are encouraged to invite knowledgeable representatives from all anticipated sub-contractors to attend the mandatory pre-bid meeting and on-site visit. Each Contractor bidding must satisfy themselves as to the exact nature and existing conditions of the site and the requirements of this solicitation. Failure to do so will not relieve the successful Contractor of its obligation to carry out the provisions of the executed Agreement.

**Location: Baldomero Lopez State Veterans' Nursing Home  
 6919 Parkway Blvd.  
 Land O' Lakes, Florida 34639 (Pasco County)**

**Date and Start Time: Wednesday, February 12th, 2020 at 10:00 AM (local time)**

**Check in/Sign in: Home's Front Entrance Reception Desk**

Pursuant to the provisions of the Americans with Disabilities Act, any person requiring special accommodations to participate in public meetings related to this solicitation is asked to advise FDVA at least five (5) business days before the meeting by contacting the FDVA Primary Contact at the email address provided above. If you are hearing or speech impaired, please contact Florida Relay Services at 1-800-955-8771 (TDD) or 1-800-955-8770 (Voice).

**4. Timeline.** It is the Contractors responsibility to monitor the State of Florida Vendor Bid System (VBS) for any updates or changes regarding this solicitation. The below dates and times are subject to change without notice:

EVENT	EVENT DATE
Issue Invitation To Bid (ITB).	Thursday, January 30th, 2020
Mandatory Pre-Bid Meeting and On-Site Visit ( <u>Begin 10:00 AM Local Time</u> ).	Wednesday, February 12th, 2020
Respondents Written Questions Due ( <u>By 3:00 PM Local Time</u> ).	Friday, February 14th, 2020
"Anticipated" Posting of FDVA Response to Respondent Questions.	Wednesday, February 19th, 2020
Bid Due Date/Time and Opening ( <u>By 3:00 PM Local Time</u> ).	Tuesday, March 3rd, 2020
"Anticipated" Posting of FDVA Notice of Intent to Award.	Monday, March 9th, 2020
"Anticipated" Execution of Agreement / Contract Commencement	Monday, March 16th, 2020

**5. Public Meeting Agendas.**

- a) Mandatory Pre-Bid Meeting and Onsite Visit (Reference above "Timeline"):
  - 1) Opening Remarks and Introductions.
  - 2) Overview of Solicitation.
  - 3) Question and Answer.
  - 4) On-Site Visit.
  - 5) Question and Answer.
  - 6) Public Comment Opportunity.
  - 7) Closing Remarks and Adjournment.
- b) Bid Opening Meeting (Reference above "Timeline"):
  - 1) Opening Remarks and Introductions.

- 2) Bid Opening and Tabulation (Announcement of Company Name and Total Bid Price).
- 3) Public Comment Opportunity.
- 4) Closing Remarks and Adjournment.

**6. Bid Submittal.** To be considered responsive, responsible bid, Respondent must execute, return and adhere to the following. Respondent failure to do so may result in the Respondent being considered non-responsive.

- a) Forms must be fully executed and submitted in a sealed envelope; one (1) sealed original copy and two (2) individually sealed duplicate copies. All three (3) individually sealed envelopes must be then be placed in one (1) outer package (size appropriate envelope or box) and sealed;
- b) Product, service, terms and conditions offered must meet the specifications as described herein and any issued addendum;
- c) Page 82– Form 1, Bidder's Acknowledgment;
- d) Page 83 – Form 2, Bid Form;
- e) Page 84-86 – Form 3, Contractor References;
- f) Page 87 – Form 4, Addendum Acknowledgement;
- g) Page 88 – Form 5, Attestation of No Conflict;
- h) Page 89 – Form 6, Drug-Free Workplace Certification; and
- i) Page 90 – Form 7, Non-Collusion Affidavit.

**7. Terms and Conditions.**

- a) The State of Florida's General Contract Conditions are outlined in Form PUR 1000, which is a downloadable document incorporated into this Invitation to Bid (ITB) by reference. Any terms and conditions set forth in this ITB document take precedence over Form PUR 1000 where applicable. [https://www.dms.myflorida.com/content/download/2933/11777/PUR\\_1000.pdf](https://www.dms.myflorida.com/content/download/2933/11777/PUR_1000.pdf)
- b) The State of Florida's General Instructions to Respondents are outlined in Form PUR 1001, which is a downloadable document incorporated into this Invitation to Bid (ITB) by reference. Any terms and conditions set forth in this ITB document take precedence over Form PUR 1001 where applicable. [https://www.dms.myflorida.com/content/download/2934/11780/PUR\\_1001.pdf](https://www.dms.myflorida.com/content/download/2934/11780/PUR_1001.pdf)

If you are unable to access Forms PUR 1000 or PUR 1001, you may contact the FDVA Primary Contact at the email address provided above to obtain a copy of these documents. If you are hearing or speech impaired, please contact Florida Relay Services at 1-800-955-8771 (TDD) or 1-800-955-8770 (Voice).

**8. Protest.** Any protest concerning this solicitation shall be made in accordance with Section 120.57(3) and 287.042(2), Florida Statutes and Chapter 28-110 of the Florida Administrative Code. Questions to FDVA Primary or Alternate Contact shall not constitute formal notice of a protest. It is FDVA's intent to ensure that specifications are written to obtain the best value for the State of Florida, ensure competitiveness, fairness, necessity and reasonableness in the solicitation process, and meet FDVA requirements.

- a) Section 120.57(3)(b), Florida Statutes and Rule 28-110.003, Florida Administrative Code: Requires that a notice of protest of the solicitation documents shall be made within seventy-two hours after the posting of the solicitation.
- b) Section 120.57(3)(a), Florida Statutes: Requires the following statement to be included in the solicitation: "Failure to file a protest within the time prescribed in Section 120.57(3), Florida Statutes, or failure to post the bond or other security required by law within the time allowed for filing a bond shall constitute a waiver of proceedings under Chapter 120, Florida Statutes."
- c) Rule 28-110.005, Florida Administrative Code: Requires the following statement to be included in the notice of decision or intended decision: "Failure to file a protest within the time prescribed in Section 120.57(3), Florida Statutes, or failure to post the bond or other security required by law within the time allowed for filing a bond shall constitute a waiver of proceedings under Chapter 120, Florida Statutes".

Any protest concerning FDVA decision must be timely received by FDVA Agency Clerk at: Florida Department of Veterans' Affairs, Office of the General Counsel - Agency Clerk, The Capitol, Suite 2105, 400 South Monroe Street, Tallahassee, FL 32399-0001.

**SECTION "II"**  
**RESPONDENT INSTRUCTIONS**

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1. **Cost Incurred.**
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4. **Form W-9 Requirement.**
5. **State of Florida Vendor Bid System (VBS).**
6. **Florida Veteran Business Enterprise Opportunity Act.**
7. **Certified Minority Business Enterprises (CMBE).**
8. **Respondent Questions and FDVA Addendum.**
9. **Qualifications.**
10. **Bid Guidelines.**
11. **Sealed Bid.**
12. **Submission of Bid.**
13. **Withdrawal of Bid.**
14. **Modification of Bid.**
15. **Bid Opening.**
16. **Rights of FDVA.**

1. **Cost Incurred.** All expenses involved with Respondent preparation and submission of its bid to FDVA, or any work performed in connection therewith, shall be born solely by the Respondent. No payment will be made for any bids received, or for any other effort required of, or made by Respondent or the successful Contractor.

2. **Respondent Registration.** Respondent must be fully registered with the State of Florida's "My Florida Market Place" procurement system by the bid opening due date and time as provided in the Timeline. Respondent must register on-line at website <https://vendor.myfloridamarketplace.com>. Respondent failure to do so may result in the Respondent being considered non-responsive and prevent the awarded Contractor from transacting any business with FDVA. For assistance, Respondent shall contact the State of Florida Vendor Help Desk at 866-352-3776.

3. **Florida Secretary of State Registration.** Respondent, whether a domestic or foreign entity, must register with the Florida Secretary of State (Florida Department of State, Division of Corporations), as well as secure and include its certificate of authority with its sealed submitted bid, by the bid opening due date and time as provided in the Timeline. Respondent failure to do so may result in the Respondent being considered non-responsive. Further, awarded Contractor must maintain its registration and certificate of authority with the Florida Secretary of State (Department of State, Division of Corporations) for the life of the Agreement. Failure to do so will prevent the awarded Contractor from transacting any business with FDVA. For assistance, Respondent shall access the Florida Department of State, Division of Corporations website <http://search.sunbiz.org>.

4. **Form W-9 Requirement.** Respondent must register and submit its electronic Form W-9 to the State of Florida Department of Financial Services (DFS). Respondent failure to do so, by the bid opening due date and time as provided in the Timeline, may result in the Respondent being considered non-responsive and prevent the awarded Contractor from transacting any business with FDVA. The Internal Revenue Service (IRS) receives and validates all Respondent Form W-9 information. To view compliance instructions and submit Form W-9, Respondent must access website <https://flvendor.myfloridacfo.com/>. For assistance, Respondent shall contact the State of Florida Vendor Form W-9 Help Desk at 850-413-5519.

5. **State of Florida Vendor Bid System (VBS).** Respondent must register on-line via <http://www.myflorida.com/apps/vbs>, for electronic notification of solicitations from the State of Florida's Vendor Bid System (VBS). Respondent failure to do so may result in the Respondent being considered

non-responsive. The State of Florida and FDVA are not under any obligation and do not guarantee that vendors will receive electronic notifications concerning the posting of notices, addendum, intent to award; as well as withdrawal, cancellation, or close of solicitations. Vendors are solely responsible for monitoring the State of Florida Vendor Bid System (VBS) for new or changing information concerning solicitations. For assistance, Respondent shall contact the State of Florida Vendor Help Desk at 866-352-3776 or via email address [vendorhelp@myflorida.com](mailto:vendorhelp@myflorida.com).

**6. Florida Veteran Business Enterprise Opportunity Act.** In accordance with the Florida Veteran Business Enterprise Opportunity Act, Section 295.187, Florida Statutes, a state agency, when considering two or more bids for the procurement of commodities or contractual services, at least one of which is from a certified veteran business enterprise, which are equal with respect to all relevant considerations, including price, quality, and service, shall award such procurement or contract to the certified veteran business enterprise. Notwithstanding Section 287.057(11), Florida Statutes, if a veteran business enterprise entitled to the vendor preference under this section and one or more businesses entitled to this preference or another vendor preference provided by law submit bids for procurement of commodities or contractual services which are equal with respect to all relevant considerations, including price, quality, and service, the state agency shall award the procurement or contract to the business having the smallest net worth. Information on certification procedures for vendor preference programs is available from the Office of Supplier Diversity (OSD) website <http://osd.dms.state.fl.us>, by phone at 850-487-0915, or via email at [OSDHelp@dms.myflorida.com](mailto:OSDHelp@dms.myflorida.com).

**7. Certified Minority Business Enterprises (CMBE).** Respondents are encouraged to seek the participation of certified minority business enterprises (CMBE). Information on CMBE procedures and programs is available online from the Office of Supplier Diversity (OSD) website <http://osd.dms.state.fl.us>, by phone at 850-487-0915 or via email at [OSDHelp@dms.myflorida.com](mailto:OSDHelp@dms.myflorida.com).

**8. Respondent Questions and FDVA Addendum.** No negotiations, decisions, or actions will be initiated or executed by a Respondent as a result of oral discussions with any FDVA or State of Florida employee. Only Respondent written questions, which are signed by persons authorized to contractually bind the Respondent, will be recognized by FDVA as duly authorized expression on behalf of the Respondent. Respondent written questions must be submitted via email (in e-mail body or attached MS Word document), by the deadline as provided in the solicitation's Timeline, to the Primary Contact Person in Section I of this solicitation. FDVA reserves the right to issue addendum(s) to solicitations, only those communications will be considered as a duly authorized expression on behalf of FDVA. Addendum(s) will contain FDVA clarifications or responses to Respondent questions, as well as details that identify formal changes to the solicitation. In accordance with the solicitation's Timeline, FDVA addendum shall be published on the State of Florida Vendor Bid System (VBS). If no written inquiries are submitted by a Respondent, all conditions and requirements specified within the solicitation shall be deemed accepted and understood by the Respondent. Each Respondent is solely responsible for monitoring the State of Florida Vendor Bid System (VBS) for new or changing information concerning all solicitations.

**9. Qualifications.** Award of the Agreement, in all respects of this solicitation and any issued addendum, shall be made to the Respondent whose bid is determined to be the lowest responsive, responsible bid, a determination that shall be made solely at the discretion of FDVA. The Respondent affirms and declares that Respondent has:

- a) The capacity to do business within the State of Florida.
- b) The necessary abilities, staff, experience, facilities, equipment, materials, and financial resources, at the present time, to complete the requirements of the Agreement in a satisfactory manner and within the required time.
- c) All federal, state and local registrations, licenses, certifications, and permits legally required to perform and complete the services as called for herein; including but not limited to any other related agreements.
- d) The intention, commitment, and means to comply with all federal, state and local codes, laws, ordinances, rules, regulations, guidelines, and requirements that could affect the provision of required services in any manner.



- e) No arrearage to the State of Florida upon debt or Agreement, nor default as surety or otherwise, upon any obligation to the State of Florida.
- f) Present good standing with the State of Florida and is not on the state's lists of ineligible contractors.
- g) No member, officer, or employee of FDVA who during his or her tenure or for two (2) years thereafter shall have any interest, direct or indirect, in the Agreement or the proceeds thereof.
- h) Respondent is of lawful age and that no other person, contractor, or corporation has any interest in the bids or Agreement proposed to be entered into.
- i) Respondent has thoroughly examined all available drawings and specifications, schedules, instructions, the solicitation, and addendum; as well as made all investigations necessary to thoroughly inform themselves regarding facilities for delivery of services as required by the solicitation. No plea of ignorance by the Respondent of conditions that exist, or that may hereafter exist as a result of failure or omission on the part of the Respondent to make the necessary examinations and investigations, or failure to fulfill in every detail the requirements of the solicitation, will be accepted as a basis for varying the requirements of FDVA or compensation to the successful Contractor.

**10. Bid Guidelines.** Respondent's bid must follow the format, structure, and sequence as required by this solicitation.

- a) Respondents are advised that all FDVA solicitations and agreements are subject to all legal requirements as provided under Florida law.
- b) Respondents are advised that exceptions to any terms or conditions contained in this solicitation must be identified in its written questions and submitted via email (by the deadline as provided in the Timeline; to the Primary Contact Person specified in Section 1 of this solicitation). Failure to do so may lead FDVA to declare any such term or condition as non-negotiable. Respondent's desire to take exception to a non-negotiable term will not disqualify it from consideration for award.
- c) If no request for clarification is submitted by Respondent, all conditions and requirements specified within the Agreement shall be deemed accepted and understood by Respondent.
- d) FDVA objects to and shall not consider any additional terms or conditions submitted by a Respondent, including any appearing in documents attached as part of a Respondent's bid. In submitting its bid, a Respondent agrees that any additional terms or conditions, whether submitted intentionally or inadvertently, shall have no force or effect.
- e) Prices shall be Respondent net, delivered prices, F.O.B. Destination. All pricing must be in United States dollars (i.e. \$1.00, USD). FDVA does not pay local, state, or federal taxes; including recovery fees, sales tax, or excise tax. FDVA tax-exempt certificate will be available upon request.

**11. Sealed Bid.** Respondent's bid including all forms required by this solicitation, as provided by FDVA (in their original format), must be fully executed and submitted in a sealed envelope; one (1) sealed original copy and two (2) individually sealed duplicate copies. All three (3) individually sealed envelopes must then be placed in one (1) outer package (size appropriate envelope or box) and sealed. Each of the three (3) individually sealed envelopes and the outer package shall be clearly labeled as provided on the title page of this solicitation, including Respondent name and address, solicitation number and title, and the bid opening due date and time as provided in the Timeline. Further, it is the Respondent's responsibility to clearly identify on the outer packaging of each sealed bid any vendor preference certifications that are applicable to its bid. Respondent failure to provide sealed bid in the manner specified above may result in the bid being considered non-responsive.

**12. Submission of Bid.** By submitting a bid, each Respondent certifies that it satisfies all criteria specified in the solicitation and any issued addendum. Respondent may not submit more than one bid.

- a) Respondent is solely responsible for ensuring that its bid is submitted in accordance with the solicitation and any issued addendum.
- b) Respondent shall submit its bid by mail (i.e. USPS, FedEx, or UPS) or in person (i.e. "by hand"? to the attention of the Primary Contact Person specified in Section I of this solicitation. **FDVA shall reject any bid submitted electronically (i.e. via e-mail).**



c) Respondent is solely responsible for ensuring that its bid is received, by the Primary Contact Person specified in Section I of this solicitation, prior to the bid opening due date and time as provided in the Timeline.

**13. Withdrawal of Bid.** Respondent bid may be withdrawn, provided that Respondent's written request to withdraw is e-mailed to and received by the Primary Contact Person specified in Section I of this solicitation prior to the bid opening due date and time as provided in the Timeline. Bids may not be withdrawn within sixty (60) business days following the bid opening due date and time as provided in the Timeline.

**14. Modification of Bid.** Respondent may withdraw, modify, and re-submit its bid, provided the re-submitted bid is received, by the Primary Contact Person specified in Section I of this solicitation, prior to the bid opening due date and time as provided in the Timeline. Respondent re-submitted bid shall be rejected if received, by the Primary Contact Person specified in Section I of this solicitation, after the bid opening due date and time as provided in the Timeline.

**15. Bid Opening.** *FDVA shall reject any bid received after the bid opening due date and time as provided in the Timeline.* Bids, received in accordance with the solicitation and any issued addendum, will be opened immediately after the bid opening due date and time as provided in the Timeline. The bid opening shall be performed at the Florida Department of Veterans' Affairs (FDVA), Mary Grizzle State Office Building, 11351 Ulmerton Road, Suite 311-K, Largo, FL 33778-1630. The public may attend the bid opening. FDVA may choose not to announce prices or release other materials pursuant to Section 119.071, Florida Statutes. Sealed bids, proposals, or replies received by FDVA pursuant to a competitive solicitation shall be exempt from public disclosure until FDVA provides notice of an intended decision, or until 30 days after the opening of bids, proposals, or final replies, whichever occurs earlier.

**16. Rights of FDVA.** In addition to all other rights of FDVA under Florida law, FDVA specifically reserves the following rights at its sole discretion:

- a) FDVA reserves the right to select the bid it believes is in the best interest of the State of Florida and FDVA.
- b) FDVA reserves the right to add, change, and delete any requirements of the solicitation.
- c) FDVA reserves the right to reject a bid, with or without cause, as nonresponsive, not responsible, not qualified, or not capable.
- d) FDVA reserves the right to withdraw, re-issue, or cancel the solicitation with or without cause.
- e) FDVA reserves the right to remedy or waive technical errors, immaterial errors, informalities, and irregularities in the solicitation and Respondent bid.
- f) FDVA reserves the right to reject a bid if pricing is inconclusive, incomplete, not submitted, or if pricing is not submitted in the format as originally provided in the solicitation.
- g) FDVA reserves the right to request any necessary clarifications or supporting documentation.
- h) FDVA reserves the right to reject any bid received after bid opening due date and time as provided in the Timeline.
- i) FDVA reserves the right to reject any bid submitted electronically (i.e. via e-mail).
- j) FDVA reserves the right to reject a bid if Respondent misstates or conceals any material fact in its bid.
- k) FDVA reserves the right to reject a bid that fails to include any information required by the solicitation in the specified sequence.
- l) FDVA reserves the right to accept and award the Agreement by item, by group, in the aggregate, or by location.

**SECTION "III"**  
**STATEMENT OF WORK****CONTENTS**

- 1. General.**
- 2. Project Launch Meeting.**
- 3. Authorities Having Jurisdiction.**
- 4. Permits, Licenses, and Fees.**
- 5. Contractor Qualifications.**
- 6. Project Management.**
- 7. Safety and Security.**
- 8. Hours of Operation.**
- 9. Project Schedule.**
- 10. Service Interruptions or Shut-Down.**
- 11. Parking, Staging, and Storage.**
- 12. Damage to State Property.**
- 13. Alteration of State Property.**
- 14. Disconnection, Removal, Reinstallation of State Items and Equipment.**
- 15. Site Work.**
- 16. Inspection and Commissioning.**
- 17. Warranty.**
- 18. FDVA Final Acceptance.**

**1. General.** Contractor shall provide all vehicles, trailers, storage containers, dumpsters, labor, services, equipment, tools, materials, parts, and supplies required for the replacement of two (2) HVAC Cooling Towers for the Condensed Water Loop for the Baldomero Lopez State Veterans' Nursing Home, located at 6919 Parkway Blvd. Land O' Lakes, Florida 34639 (Pasco County). FDVA requires specified services to be completed to the full satisfaction and acceptance of FDVA and any applicable authorities having jurisdiction, within one-hundred-sixty calendar days (160) from the date of Agreement's full execution.

**2. Project Launch Meeting.** Contractor shall schedule and conduct an on-site, post-award project launch ("pre-construction") meeting with FDVA Contract Manager, within fifteen (15) business days from the date of Agreement's full execution. The purpose of the meeting is to establish lines of communications, verify contact persons, initiate project scheduling, and discuss other relative project topics. Prior to commencement of work, Contractor shall provide FDVA Contract Manager with a written copy of all key contact information, to include but not limited to Contractor contact names, telephone numbers (office, cell, and emergency), and email addresses where Contractor Project Manager or designee can be reached during the hours of operation (Monday through Friday, between the hours of 8:00 am and 5:00 pm), as well as outside the hours of operation.

**3. Authorities Having Jurisdiction.** FDVA is licensed by the Agency for Health Care Administration (AHCA) and regularly inspected by AHCA, United States Department of Veterans' Affairs (USDVA), Centers for Medicare and Medicaid Services (CMS), and State of Florida Fire Marshall. Contractor shall reference, adhere to, and comply with Environmental Protection Agency (EPA), Volusia County requirements, Florida Building Code, International Building Code, Americans with Disabilities Act (ADA), Life Safety Code, National Electrical Code (NEC), Underwriters Laboratories (UL), National Fire Protection Association (NFPA), as well as all other applicable local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction.

**4. Permits, Licenses, and Fees.** Contractor shall be responsible for scheduling, applying, paying for, and securing all applicable permits, licenses, variances, inspections, approvals, exemptions, certifications, tagging, and permissions required by local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction; including but not limited to necessary notification and coordination with applicable authorities having jurisdiction.

Contractor must submit all applicable documentation specified above, as well as that of agents and their employees, subcontractors and their employees, and all other persons performing any work under the Agreement, to FDVA Contract Manager for verification within fifteen (15) business days from date of fully executed Agreement. Failure of Contractor to provide documentation will prevent commencement of all work until Contractor provides satisfactory evidence to FDVA Contract Manager for verification or may result in termination of Agreement.

**5. Contractor Qualifications.** Licensed Contractor shall have the necessary experience, facilities, equipment, materials, ability, and financial resources to perform the required services. Licensed Contractor must have no less than five (5) years documented experience in the engaged field(s). As applicable, all Contractor personnel, agents, representatives, subcontractors and their employees, and all other persons performing services or inspections in performance of the Agreement shall be licensed, certified, and manufacturer's factory authorized to remove, install, maintain, and repair engaged materials, parts, and supplies; utilize, maintain, and repair the engaged equipment and tools; inspect the engaged materials, parts, supplies, equipment, and tools; and properly dispose of all project related waste. Contractor must submit all applicable licenses, certifications, and authorizations to FDVA Contract Manager for verification within fifteen (15) business days from date of fully executed Agreement. Failure of Contractor to provide documentation will prevent commencement of all work until Contractor provides satisfactory evidence to FDVA Contract Manager for verification or may result in termination of Agreement.

**6. Project Management.** Contractor shall provide sufficient personnel to perform the requirements of the executed Agreement and assume responsibility for managing the Contractor's project team for the life of the Agreement. Contractor shall be responsible for the successful completion of the Agreement, including the work of Contractor staff, as well as agents and their employees, subcontractors and their employees, and all other persons performing any work under the Agreement.

a) Contractor Project Manager: Prior to commencement of work, Contractor shall appoint a project manager who will be FDVA's primary point of contact. Contractor's Project Manager will oversee schedules, coordinate activities, report on progress, notify FDVA of any changes or adverse events, and as required meet with FDVA Contract Manager (on-site at SVNH). Contractor will be responsible for developing and maintaining a detailed project schedule and for reporting progress against the schedule on a daily basis to FDVA Contract Manager. Contractor's Project Manager does not have the authority to make any changes to the Agreement. In the absence of Contractor's Project Manager, Contractor will appoint a designee to act on behalf of Contractor's Project Manager.

b) FDVA Contract Manager: Prior to commencement of work, FDVA will appoint a Contract Manager who will be the Contractor's primary contact. FDVA Contract Manager, in consultation with SVNH Administrator, will be solely responsible for contract management, monitoring performance, certifying that requirements are met, and that invoicing is in accordance with the Agreement. FDVA Contract Manager will represent FDVA requirements, review and approve Contractor deliverables, provide operating insight, resolve on-site issues, and make decisions regarding alternate configuration choices. FDVA Contract Manager does not have the authority to make any changes to the Agreement. In the absence of FDVA Contract Manager, FDVA will appoint a designee to act on behalf of FDVA Contract Manager.

c) FDVA SVNH Administrator: SVNH Administrator is accountable for their respective SVNH's operation, including but not limited to oversight of all FDVA residents, staff, property, activities, programs, and events; as well as fiscal, administrative, clinical, risk management, quality assurance, and regulatory functions. SVNH Administrator does not have the authority to make any changes to the Agreement. In the absence of SVNH Administrator, FDVA will appoint an on-site designee to act on behalf of the SVNH Administrator.

d) FDVA Contracting Administrator: FDVA Contracting Administrator, located at FDVA Headquarters in Largo, FL will be responsible for administering the terms and conditions of the Agreement, issuing all modifications (amendment or change order), and exercising any extension or termination. In the absence of FDVA Contracting Administrator, FDVA Purchasing Officer will act on behalf of FDVA Contracting Administrator.

**7. Safety and Security.**

- a) Check In: Prior to commencement of daily work, Contractor will sign in at SVNH loading dock entrance and then check in with FDVA Contract Manager to acknowledge Contractors commencement of work, as well as to ensure that FDVA activities in the work area are curtailed and that FDVA resident, staff, and visitor property is removed from the work area.
- b) Health Insurance Portability and Accountability Act (HIPAA): Contractor must comply with all requirements of the Health Insurance Portability and Accountability Act (HIPAA). Any violation of requirements shall result in termination of the Agreement and all remedies available by law shall become available to FDVA.
- c) Jobsite Security: Contractor is responsible for continuously maintaining a safe and secure job site. Contractor shall ensure that adequate safeguards are implemented for the project. Contractor shall wear easily identifiable ID badges or uniforms. Contractor is restricted to the immediate work area; Contractor must obtain SVNH Administrator and FDVA Contract Manager approval prior to accessing any other FDVA area.
- d) Safety Inspection: Contractor is responsible for continuously maintaining a safe job site; Contractor shall ensure that adequate safeguards are implemented for the project. A daily safety inspection will be performed by both Contractor and FDVA Contract Manager or designee to ensure all safety precautions have been taken to protect the health and welfare of all FDVA and Contractor staff, as well as SVNH residents and any visitors.
- e) Jobsite Safety: Contractor shall ensure that FDVA staff, residents, and any visitors remain at a safe distance and are not in the work area. All labor, services, equipment, tools, materials, parts, and supplies, as well as preparation and application methods will conform to "best practice" methodologies of the engaged field. Vehicles, trailers, storage containers, dumpsters, equipment, tools, materials, parts, and supplies must not be left unattended for any reason, at any time. Contractor shall be compliant with OSHA and all other applicable local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction.
- f) Material Safety Data: Contractor shall provide a copy of the material safety data sheets (MSDS) for all materials and supplies used on-site to FDVA Contract Manager. The MSDS shall remain on file with FDVA Contract Manager as it provides valuable safety and adverse reaction information.  
**Note:** All materials and supplies must be no or low volatile organic compound (VOC) and shall be approved for use in skilled nursing/long-term healthcare and foodservice environments.
- g) Personal Protection and Safety Equipment: As applicable, proper personal protection and safety equipment shall be worn by Contractor personnel, agents, representatives, subcontractors and their employees, and all other persons performing work under the Agreement.
- h) Respiratory Protection Program (RPP): Prior to Contractor performing any work which may introduce dust, fumes, materials, or other substance into the conditioned spaces of the SVNH, Contractor shall notify FDVA Contract Manager of such conditions and implement preventative vapor barrier measures (i.e. visqueen polyethylene plastic sheeting, temporary walls, etc.) and masking. Contractor shall have a RPP in compliance with all applicable local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, and requirements. Prior to commencement of work, Contractor will provide a copy of Contractor's RPP to FDVA Contract Manager.
- i) Work Area Protective Measures: Contractor shall provide all necessary protective measures needed to prevent damage to any property, including but not limited to all nearby surfaces, landscaping, vehicles, and persons. This may require masking, erection of windscreens, barriers, roping-off, posting signs/devices (to include but not limited to notice of warning and caution), or other protective measures in any area where work is being performed. Protection of all work areas and any adjacencies is the sole responsibility of the Contractor.
- j) Cleanup: Contractor must ensure that the project jobsite is kept clean and safe on a daily basis. Contractor shall be responsible for the immediate cleanup of any project related spills and excess materials, including but not limited to all equipment, tools, materials, parts, supplies, debris, pallets, and empty containers. Notwithstanding safety concerns, all protective measures must be immediately removed after each given work area has been completed. Contractor shall immediately notify FDVA Contract Manager of any excessive spills so that FDVA staff, residents, and visitors can be warned and kept away from the area. Should a spill require bio-exclusion techniques, the

Contractor shall secure requisite services to perform such services. All adjacencies, walls, windows, doors, gutters, and floors (entryway, sidewalk, walkway, patio, landing, and parking areas) shall be inspected and cleaned to original condition until Contractor secures FDVA Contract Manager's full acceptance and approval.

k) Non-regulated and Regulated Waste Disposal Services: State Veterans Nursing Home (SVNH) dumpsters will not to be used for disposal of any project related waste. Contractor shall be solely responsible for the proper disposal and subsequent dumping of all waste resulting from the performance of the Agreement, in accordance with all applicable local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, and requirements, as well as any applicable authorities having jurisdiction. Unless written prior approval of FDVA Contract Manager states otherwise, all waste resulting from the requirements of the Agreement shall be removed via assigned hallway paths to SVNH's loading and unloading dock. Any waste removal shall not involve the rest of the Home.

l) Check Out: Upon completion of daily work, prior to physically leaving SVNH, Contractor shall notify FDVA Contract Manager that Contractor staff has completed work and confirm that all safety and security measures have been performed.

**8. Hours of Operation.** Given the nature and dynamics of the SVNH, time is of the essence in the performance of the Agreement. All services shall be performed Monday through Friday, between the hours of 8:00 am and 5:00 pm; any work to be scheduled and performed outside of these dates and times shall require prior written approval of FDVA Contract Manager.

**9. Project Schedule.** Within fifteen (15) business days, from the date of Agreement's execution, Contractor must provide a project schedule to FDVA Contract Manager for approval. Project schedule shall be an effective framework tool for project management. At minimum, Contractor will update the project schedule on a weekly basis. Project schedule will consist of project planning, design approvals, weekly work details, milestones, as well as a dated timeline for mobilization and full project completion for the project. Contractor shall adhere to the project schedule. Unless prior written approval has been granted by FDVA Contract Manager, all work shall be scheduled with FDVA Contract Manager at least seventy-two (72) hours prior to performance.

**10. Service Interruptions or Shut-Down.** Any potential service interruptions or shut-down of existing services shall be as brief as possible and must be scheduled for times other than normal operating hours, whenever possible. Contractor must secure prior written approval of FDVA Contract Manager by no later than seventy-two (72) hours prior to interruptions in service or shutdown of existing services. Operations of existing systems shall be continuous during work periods. Mechanical systems serving building spaces shall remain active during work periods so as not to cause any disruption to other building spaces. **Note:** FDVA reserves the right to suspend Contractor work due to any AHCA, USDVA, CMS, or other authority having jurisdiction inspection or survey, with no penalty assessed to Contractor. Further, FDVA shall consider suspension of Contractor work due to weather conditions, as well as materials, parts, and supplies application requirements with no penalty assessed to Contractor.

**11. Parking, Staging, and Storage.** On-site parking, staging, and storage of Contractor vehicles, trailers, storage containers, dumpsters, equipment, tools, materials, parts, and supplies is not permitted unless prior written approval is granted by FDVA Contract Manager. FDVA assumes no liability for damage to or loss of Contractor vehicles, trailers, storage containers, dumpsters, equipment, tools, materials, parts, and supplies (regardless whether pre-staged, staged, stored or otherwise). Contractor is fully responsible for all deliveries, unloading and storage, movement of Contractor staff and commodities, and return shipping necessary to perform the requirements of the Agreement. Public health and safety related to Contractor vehicles, trailers, storage containers, dumpsters, deliveries, unloading, storage, movement of Contractor staff and commodities, return shipping of any equipment, tools, materials, parts, and supplies, as well as all work performed under the Agreement shall be the sole responsibility of Contractor. Upon completion of the project, Contractor will remove all Contractor vehicles, trailers, storage containers, dumpsters, equipment, and tools, as well as remaining materials, parts, and supplies from SVNH property.

**12. Damage to State Property.** FDVA Contract Manager and Contractor shall conduct a daily inspection of the work area to verify if any potential for damage exists or if actual pre-existing/existing damage to State property has occurred. Contractor must immediately report any pre-existing or Contractor caused damage of State property to FDVA Contract Manager, along with written explanation of damage, recommended remedy, as well as photographic evidence of damage and proof of mutually accepted, eventual resolution. With prior written approval of FDVA Contract Manager, Contractor shall immediately repair, replace, or restore any State property damaged by Contractor, at a minimum, to the condition that existed immediately prior to the time of damage. All repairs, parts, or replacement of damaged property shall be like original quality, color, and design, in accordance with manufacturer's specifications and warranty, as well as all applicable permits, licenses, variances, inspections, approvals, exemptions, certifications, tagging, and permissions required by local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction. Upon completion of project, FDVA Contract Manager and Contractor will conduct a final inspection of the work area. Any Contractor caused damage to any communications, fire service, utility-owned, and municipality-owned property or equipment, is the sole responsibility of the Contractor, including but not limited to remedy, cost and penalty thereof, in accordance with manufacturer's specifications and warranty, as well as all applicable permits, licenses, variances, inspections, approvals, exemptions, certifications, tagging, and permissions required by local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction.

**13. Alteration of State Property.** No alteration to State property shall be made without a prior fully executed contract amendment or change order. Any alteration must be in accordance with manufacturer's specifications and warranty, as well as all applicable local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction. Any Contractor alterations to any communications, fire service, utility-owned, and municipality-owned property or equipment, is the sole responsibility of the Contractor, including but not limited to remedy, cost and penalty thereof, in accordance with manufacturer's specifications and warranty, as well as all applicable permits, licenses, variances, inspections, approvals, exemptions, certifications, tagging, and permissions required by local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction.

**14. Disconnection, Removal, and Reinstallation of State Items and Equipment.** With FDVA Contract Manager prior written approval, in accordance with manufacturer's specifications and warranty, Contractor will provide for the disconnection, removal, and reinstallation of any and all mounted, fastened in place, plumbed, and electrical equipment, or any and all other items necessary to perform the requirements of the Agreement. If necessary, Contractor shall take pictures and measurements to ensure items and equipment are replaced to their original position(s).

**15. Site Work.**

**DIVISION 20 - MECHANICAL**

20 0000	General Mechanical Requirements
20 0513	Motors
20 0529	Piping and Equipment Supporting Devices
20 0553	Mechanical Systems Identification
20 0700	Mechanical Systems Insulation

**DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING**

23 0594A	Water Systems Test Adjust Balance
23 2116	Pipe and Pipe Fittings
23 6000	Primary Cooling Equipment

**SECTION 20 0000**

**GENERAL MECHANICAL REQUIREMENTS**

**PART 1 - GENERAL**

**1.01 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.02 DESCRIPTION**

- a. Intent of drawings and Specifications is to obtain complete systems, tested, adjusted, and ready for operation.
- b. Except as otherwise defined in greater detail, the terms "provide", "furnish" and "install" as used in Division 20 and 23 Contract Documents shall have the following meanings:
  - 1. "Provide" or "provided" shall mean "furnish and install".
  - 2. "Furnish" or "furnished" does not include installation.
  - 3. "Install" or "installed" does not include furnishing.
- c. Include incidental details not usually shown or specified, but necessary for proper installation and operation.
- d. Check, verify and coordinate work with drawings and specifications prepared for other trades. Include modifications, relocations or adjustments necessary to complete work or to avoid interference with other trades.
- e. Information given herein and on drawings is as exact as could be secured but is not guaranteed. Do not scale drawings for exact dimensions.
- f. Contractor may install additional piping, fittings and valves, not shown on drawings, for testing purposes or for convenience of installation. Where such materials are installed, they shall comply with specifications and shall be sized to be compatible with system design. Remove such installed materials when they interfere with design conditions or as directed by Architect.

**1.03 RELATED WORK**

- a. Utility Services:
  - 1. Determine utility connection requirements and include in Base Bid all costs to Owner for utility service.
  - 2. Include costs for temporary service, temporary routing of piping or any other requirements of a temporary nature associated with utility service.
- b. Temporary Services:
  - 1. Division 01 - Temporary Facilities and Controls.
- c. Continuity of Service:
  - 1. No service shall be interrupted or changed without permission from Architect and Owner. Obtain written permission before any work is started.
  - 2. When interruption of services is required, Architect, Owner, and other concerned parties shall be notified and shall determine a time.



- d. Demolition:
  - 1. Division 02 - Selective Demolition.
  - 2. Perform demolition as required to accomplish new work.
  - 3. Accomplish work in neat workmanlike manner to minimize interference, annoyance or inconvenience such work might impose on Owner or other Contractors.
  - 4. Unless otherwise noted, remove from premises materials and equipment removed in demolition work.
  - 5. Equipment noted to be removed and turned over to Owner, shall be delivered to Owner at place and time Owner designates.
  - 6. Where materials are to be turned over to Owner or reused and installed by Contractor, it shall be Contractor's responsibility to maintain condition of materials and equipment equal to that existing before work began. Repair or replace damaged materials or equipment at no additional cost to Owner.
  - 7. Where demolition work interferes with Owner's use of premises, schedule work through Architect, Owner and with other Contractors to minimize inconvenience to Owner. Architect must approve schedule before Contractor begins such Work.
- e. Concrete Work:
  - 1. Provide cast-in-place concrete as required by Contract Documents unless otherwise noted.
  - 2. Provide anchor bolts, metal shapes and templates required to be cast in concrete or used to form concrete for support of mechanical equipment.

**1.04 REQUIREMENTS OF REGULATORY AGENCIES**

- a. Rules and regulations of Federal, State and Local Authorities and utility companies, in force at time of execution of Contract shall become part of this specification.

**1.05 REFERENCE STANDARDS**

- a. Agencies or publications referenced herein refer to the following:
  - 1. AGA American Gas Association
  - 2. AMCA Air Movement and Control Association
  - 3. ANSI American National Standards Institute
  - 4. AHRI Air-Conditioning, Heating and Refrigeration Institute
  - 5. ASHRAE American Society of Heating Refrigerating and Air Conditioning Engineers
  - 6. ASPE American Society of Plumbing Engineers
  - 7. ASSE American Society of Sanitary Engineering
  - 8. AWS American Welding Society
  - 9. AWWA American Water Works Association
  - 10. ASME American Society of Mechanical Engineers
  - 11. ASTM American Society for Testing and Materials
  - 12. CDA Copper Development Association
  - 13. CISPI Cast Iron Soil Pipe Institute
  - 14. FMG FM Global
  - 15. FS Federal Specifications
  - 16. IEEE Institute of Electrical and Electronics Engineers
  - 17. MCA Mechanical Contractors Association
  - 18. MSS Manufacturers Standardization Society

- 19. NEC National Electrical Code
- 20. NEMA National Electrical Manufacturers Association
- 21. NFPA National Fire Protection Association
- 22. NIST National Institute of Standards & Technology
- 23. NSF National Sanitation Foundation
- 24. NSPI National Spa and Pool Institute
- 25. OSHA Occupational Safety and Health Administration
- 26. PDI Plumbing and Drainage Institute
- 27. SMACNA Sheet Metal and Air Conditioning Contractors National Association
- 28. UL Underwriters Laboratories, Inc.
- 29. WQA Water Quality Association

- b. Work shall be in accordance with latest edition of codes, standards or specifications unless noted otherwise.

## 1.06 SUBMITTALS

- a. Shop Drawings (Product Data):
  - 1. Refer to Division 01 - Submittal Procedures.
  - 2. Note that for satisfying submittal requirements for Divisions 20, 21, 22 or 23, "Product Data" is usually more appropriate than true "Shop Drawings" as defined in Division 01. However, the expression "Shop Drawings" is generally used throughout Specification.
  - 3. Submit shop drawings for equipment and systems as requested in the respective specification sections.
  - 4. Specifically mark general catalog sheets and drawings to indicate specific items submitted and its correlation to specific designation for product in drawings.
  - 5. Specifically indicate proper identification of equipment by name and/or number, as indicated in specification and shown on drawings.
  - 6. When manufacturer's reference numbers are different from those specified, provide correct cross-reference numbers for each item. Clearly mark and note submittals accordingly.
  - 7. Submit complete record of required components when fixtures, equipment and items specified include accessories, parts and additional items under one designation.
  - 8. Include composite wiring diagrams for electrically powered equipment and devices.
  - 9. Where submittals cover products containing non-metallic materials, include "Material Safety Data Sheet" (MSDS) from manufacturer stating physical and chemical properties of components and precautionary considerations required.
  - 10. Submit shop drawings or product data as soon as practicable after signing contracts. Submittals must be approved before installation of materials and equipment.
  - 11. Submittals that are not complete, not permanent or not properly checked by Contractor will be returned without review.
- b. Certificates and Inspections:
  - 1. Obtain and pay for inspections required by authorities having jurisdiction and deliver certificates approving installations to Owner unless otherwise directed.
- c. Operation and Maintenance Manuals:
  - 1. Refer to Division 01 - Operation and Maintenance Data.
  - 2. Upon completion of Work but before final acceptance of system, submit to Architect for approval, 3 copies of operation and maintenance manuals in loose-leaf binders. If "one

copy" is larger than 2" thick or consists of multiple volumes, submit only one set initially for review. After securing approval, submit 3 copies to Owner.

3. Organize manuals by specification section number and furnish table of contents and tabs for each piece of equipment or system.
  4. Fire protection system shall be separately bound.
  5. Manuals shall include the following:
    - a. Copies of Shop Drawings
    - b. Manufacturer's operating and maintenance instructions. Include parts lists of items or equipment, with component exploded views and part numbers. Where manufacturer's data includes several types or models, designate applicable type or model.
    - c. CD ROM's of O&M data with exploded parts lists where available
    - d. Phone numbers and addresses of local parts suppliers and service companies
    - e. Internet/WEB page addresses where applicable
    - f. Wiring diagrams
    - g. Startup and shutdown procedures
    - h. Composite electrical diagrams
    - i. Flow diagrams
    - j. Lubrication instructions
    - k. Factory and field test records (Refer to Test and Balancing in Part 3 of this section.)
    - l. Air and water balance reports
    - m. Valve identification charts as specified in Section 20 0553 - Mechanical System Identification
    - n. Additional information, diagrams or explanations as designated under respective equipment or systems specification sections.
  6. Instruct Owner's representative in operation and maintenance of equipment. Instruction shall include complete operating cycle on all apparatus.
  7. Furnish O&M Manuals and instructions to Owner prior to request for final payment.
- d. Record Documents:
1. Refer to General Conditions of Contract, and Division 01 - Project Record Documents. Prepare complete set of record drawings in accordance with Division 01.

#### **1.07 JOB CONDITIONS**

- a. Building Access:
  1. Arrange for necessary openings in building to allow for admittance of all apparatus.
- b. Electrical Coordination:
  1. Refer to Section 20 0513 - Motors
  2. Contractors for Divisions 20 and 23 shall provide the following items as specified under their respective Division(s) (Division 20 and 23):
    - a. Motors
    - b. Electrically powered equipment
    - c. Electrically controlled equipment
    - d. Starters, where specified
    - e. Variable frequency drives, where specified
    - f. Control devices, where specified

- g. Temperature Control wiring
  - h. Wiring diagrams to Electrical Contractor for apparatus indicating external connection and internal controls.
  - i. Disconnect devices furnished with units (VFDs, chillers, prepackaged control devices, etc.)
    - 1). Devices shall have an interrupting rating not less than that of the upstream overcurrent device as shown on electrical drawings.
    - 2). Equipment electrical connection points shall be labeled with listed electrical short circuit current rating (SCCR). SCCR shall not be less than interrupting rating of upstream overcurrent device as shown on electrical drawings. SCCR shall be marked on equipment control enclosure in accordance with UL508, or other acceptable, accredited third-party testing agency standards.
  - 3. Electrical Contractor will provide the following devices required for control of motors or electrical equipment, unless noted otherwise.
    - a. Starters
    - b. Disconnect devices
    - c. Control devices:
      - 1). Pushbuttons
      - 2). Pilot lights
      - 3). Contacts
    - d. Conduit, boxes and wiring for power wiring.
    - e. Conduit, boxes and wiring for control wiring, except temperature control wiring.
  - 4. Electrical Contractor will make connections, from power source to starter or variable frequency drive and from starter or variable frequency drive, where specified, to motor.
  - 5. Where starters or other similar control devices are furnished by this contractor, they shall be installed by this contractor and wired by Electrical Contractor.
  - 6. Should any change in size, hp rating, voltage, or means of control be made to any motor or other electrical equipment after Contracts are awarded, this contractor shall immediately notify Electrical Contractor of change. Additional costs due to these changes shall be responsibility of this contractor.
- c. Cutting and Patching:
- 1. Refer to General Conditions of the Contract, and Division 01 - Cutting and Patching.
  - 2. Perform cutting and patching required for complete installation of systems, unless otherwise noted. Patch and restore work cut or damaged to original condition. This includes openings remaining from removal or relocation of existing system components.
  - 3. Provide materials required for patching unless otherwise noted.
  - 4. Do not pierce beams or columns without permission of Architect and then only as directed. If openings are required through walls or floors where no sleeve has been provided, hole shall be core drilled to avoid unnecessary damage and structural weakening.
  - 5. Where alterations disturb lawns, paving, walks, etc., replace, repair or refinish surfaces to condition existing prior to commencement of work. This may include areas beyond construction limits.
- d. Housekeeping and Cleanup:
- 1. Refer to Division 01 - Closeout Procedures.
  - 2. As work progresses and/or as directed by Architect, periodically remove waste materials from building and leave area of work broom clean. Upon completion of Work, remove tools, scaffolding, broken and waste materials, etc., from site.

## **1.08 WARRANTY**

- a. Refer to Division 01 for general warranty requirements.
- b. Refer to technical sections for warranty requirement for each system.
  - 1. Where no warranty requirements are called out, warrant equipment, materials, and workmanship to be free from defect as called out in Division 01.
- c. Warrant that systems will operate without objectionable noise, vibration and uncontrolled expansion.
- d. Repair, replace or alter systems or parts of systems found defective at no extra cost to Owner.
- e. In any case, wherein fulfilling requirements of any warranty, if this contractor disturbs any work warranted under another contract, this contractor shall restore such disturbed work to condition satisfactory to Architect and warranty such restored work to same extent as it was warranted under such other contract.
- f. Warranty shall include labor, materials, and travel time.

## **PART 2 - PRODUCTS**

### **2.01 PRODUCT SUBSTITUTIONS**

- a. Refer to Division 01 - Product Requirements.

## **PART 3 - EXECUTION**

### **3.01 GENERAL**

- a. Verify elevations and dimensions prior to installation of materials.

### **3.02 DELIVERY, STORAGE, HANDLING, AND PROTECTION**

- a. Deliver products to the site under provisions of Division 01.
- b. Store and protect products under provisions of Division 01.
- c. Store in clean, dry space.
- d. Maintain factory wrapping or provide cover to protect units from dirt, water, construction debris, and traffic.
- e. Handle in accordance with manufacturer's written instructions.
- f. Handle carefully to avoid damage to components, enclosure, and finish. Lift only with lugs provided for the purpose.
- g. Provide supplemental heat if required to prevent equipment from moisture contamination.
- h. Protect openings in equipment until connected to system to prevent entry of foreign materials.

### **3.03 EQUIPMENT SHUTOFF VALVES**

- a. Provide shutoff valves at equipment connected to piping system. Refer to valve section or system section for requirements of valve type.

**3.04 EQUIPMENT ACCESS**

- a. Install piping, conduit and accessories to permit access to equipment for maintenance. Relocate piping, equipment or accessories to provide access at no additional cost to Owner.
- b. Install equipment with sufficient maintenance space for removal, repair or changes to equipment. Provide ready accessibility to equipment without moving other future or installed equipment (including light fixtures) or system components.

**3.05 EQUIPMENT SUPPORTS**

- a. Provide supporting steel not indicated on drawings as required for installation of equipment and materials including angles, channels, beams, hangers, etc.

**3.06 EQUIPMENT GUARDS**

- a. Provide equipment guards over belt driven assemblies, pump shafts, exposed fans, and elsewhere as indicated in this Specification or required by Code.
- b. Paint equipment guards bright yellow.
- c. Equipment guards shall comply with OSHA requirements.

**3.07 SUPPORT PROTECTION**

- a. In occupied areas, mechanical rooms and areas requiring normal maintenance access, guard certain equipment to protect personnel from injury.
- b. Provide minimum 1/2" thick Armstrong Armaflex insulation or similar product applied with Armstrong 520 adhesive on lower edges of equipment and mechanical supporting devices suspended less than 7 ft. above floors, platforms or catwalks in these areas.
- c. Protect threaded rod or bolts at supporting elements as described above. Trim threaded rod or bolts such that they do not extend beyond supporting element and devices.

**3.08 MECHANICAL SYSTEMS IDENTIFICATION**

- a. Refer to Section 20 0553 - Mechanical Systems Identification

**3.09 TEST AND BALANCING**

- a. Tests for equipment, ductwork and piping systems shall be performed as specified in their respective specification sections in accordance with technical requirements noted.
- b. Provide equipment required for testing, including fittings for additional openings required for test apparatus.
- c. All piping inspections and testing shall be successfully completed and approved before application of covering materials.
- d. When equipment or systems fail to meet minimum test requirements, replace or repair defective work or material as necessary and repeat inspection and test until equipment or systems meet test requirements. Make repairs with new materials. Caulking of holes or threaded joints is not allowed.
- e. Contractor is responsible for certifying in writing equipment and system test results. Certification shall include identification of portion of system tested, date, time, test criteria, test

medium and pressure used, duration of test and name and title of person signing test certification document.

- f. Maintain copies of certified test results, including those for any failed tests, at project site. At completion of project, include copies of test records and certifications in O&M Manuals.
- g. Balancing of various systems shall be in accordance with associated specification sections in addition to requirements noted herein.
- h. If exterior domestic water supply also serves as source for fire protection systems, either exterior or interior or both, it shall be tested according to fire protection system requirements as specified in applicable Specification Section.

### **3.10 START-UP**

- a. Systems and equipment shall be started, tested, adjusted and turned over to Owner ready for operation. This includes "Owner-Furnished, Contractor-Installed" (OFICI) and "Contractor-Furnished, Contractor-Installed" (CFCI) systems and equipment.
- b. Follow manufacturer's pre-start-up check-out, start-up, trouble shooting and adjustment procedures.
- c. Contractor shall provide services of technician/mechanic knowledgeable in start-up and check-out of types of systems and equipment on project.
- d. Provide start-up services by manufacturer's representative where specified or where Contractor does not have qualified personnel.
- e. Coordinate start-up with all trades.

### **3.11 LUBRICATION**

- a. Upon completion of work and before turning over to Owner, clean and lubricate bearings except sealed and permanently lubricated bearings. Use only lubricant recommended by manufacturer.
- b. Contractor is responsible for maintaining lubrication of mechanical equipment under this Contract until Work is accepted by Owner.

### **3.12 CLEANING**

- a. Clean systems after installation is complete.
- b. Clean piping internally and externally to remove dirt, plaster dust or other foreign materials. When external surfaces of piping are rusted, clean and restore surface to original condition.
- c. Clean pipeline strainers to restore them to original condition or replace with new strainer elements.
- d. Clean equipment and plumbing fixtures as recommended by manufacturers.
- e. Replace throwaway or replaceable media air filters used during construction period with new filters or new filter media after construction has been completed and before building is turned over to Owner. Filter replacement shall be as hereinafter specified.
- f. Blow and clean dirt, plaster dust and other foreign matter from coils, terminal devices, diffusers, registers and grilles.



- g. Thoroughly clean equipment of stains, paint spots, dirt and dust. Remove temporary labels not used for instruction or operation.
- h. Provide additional cleaning of individual piping systems and apparatus as hereinafter specified.

**END OF SECTION**

**This section is intentionally left blank**

**SECTION 20 0513**

**MOTORS**

**PART 1 - GENERAL**

**1.01 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.02 SUBMITTALS**

- a. Shop Drawings including, but not limited to, the following:
  1. Manufacturer
  2. hp, voltage, phase, hertz, rpm
  3. Motor type
  4. Enclosure type
  5. Frame type
  6. Insulation class
  7. NEMA design designation
  8. Service factor
  9. Nominal efficiency at full load
  10. Power factor at full load
  11. Full load amperes
  12. Bearings
  13. Mountings
  14. Dimensions
  15. Weight

**1.03 PRODUCT CRITERIA**

- a. Motors covered by this Specification shall conform to applicable requirements of NEMA, IEEE, ANSI, and NEC Standards and shall be UL Listed where applicable for service specified.
- b. Motors shall be designed for conditions in which they will be required to perform; i.e., general purpose, splash proof, explosion proof, standard duty, high torque or other special type as required by equipment manufacturers.
- c. Select motors so they do not exceed nameplate rating nor operate into service factor to meet specified duty.
- d. Motors located inside air handling units or exposed located in outdoor or wash down environments shall have totally enclosed fan cooled (TEFC) enclosures.
- e. Motors shall be furnished for starting in accordance with utility requirements and be compatible with starters specified hereinafter or under Electrical sections of Specifications.
  1. Refer to Section 26 2913 - Enclosed Controllers for reduced voltage starting requirements.
  2. Starters for NEMA rated 200 or 230 V motors, 25 hp and above shall be reduced voltage starting type.

3. Starters for NEMA rated 460 V motors, 60 hp and above to be reduced voltage starting type.

## **PART 2 - PRODUCTS**

### **2.01 MATERIALS**

- a. Materials shall be new and guaranteed for service intended.

### **2.02 ELECTRICALLY COMMUTATED MOTORS (ECM)**

- a. Motor assembly shall be designed for use on direct drive fans or pumps and shall be electrically commutated, DC, brushless type, specifically designed for use with 120 Volt or 208-230/277 Volt, 60 Hz single-phase electrical input or three-phase, 60 Hz electrical input as scheduled.
- b. Motor speed shall be variable via compatible input signal and shall be complete with and operated by single-phase integrated controller/inverter that operates wound stator and senses rotor position to electronically commutate stator. Motor shall maintain minimum of 70% efficiency over entire operating range.
- c. Motors shall:
  1. have permanently lubricated ball bearings
  2. be designed for synchronous rotation.
  3. be permanent magnet type with near-zero rotor losses.
  4. be able to be mounted with shaft in horizontal or vertical orientation.
  5. be controllable from local and remote speed-control adjustments
  6. be designed to overcome reverse rotation without affecting life expectancy
- d. Speed Control (Drive):
  1. Motor manufacturer shall provide factory installed PWM speed control drive for local (manual) and remote speed adjustment. Local PWM drive shall be field adjustable with standard screwdriver. Drive shall also be capable of receiving 0-10 vdc signal from DDC controller to control fan or pump speed.
  2. Drive shall provide soft start and adjustable speed change ramp rate.
  3. Drive shall provide motor protection consisting of locked rotor, over-current, and thermal overload protection at minimum.

### **2.03 INDUCTION MOTORS**

- a. Voltage Ratings
  1. Refer to equipment schedules and specification sections for voltages required.
  2. Unless otherwise indicated, motors 1/3 hp and smaller shall be rated 115 V for operation on 120 V, 1 Ph, 60 Hz service.
  3. Unless otherwise indicated, motors 1/2 hp and larger shall be rated:
    - a. 460 V for operation on 480 V, 3 Ph, 60 Hz service.
    - b. 200 V for operation on 208 V, 3 Ph, 60 Hz service.
    - c. 230 V for operation on 240 V, 3 Ph, 60 Hz service.
- b. Motors shall be 4 pole (approximately 1750 rpm) unless otherwise noted.
- c. Single-phase motors shall be furnished with built-in thermal overload protection.

- d. Use NEMA Design B motors, normal starting torque with regreasable ball bearings, and Class B insulation unless specified otherwise or unless manufacturer of equipment on which motor is being used has more stringent requirements.
  - 1. Bearings shall be rated for minimum AFBMA 9, L-10 life of 26,280 hours (belted) and 200,000 hours (direct-coupled) at full-load.
- e. Motors shall be rated continuous duty and have 1.15 service factor unless otherwise noted.
- f. Motors Driven by Variable Frequency Drives (VFD)
  - 1. Motors shall comply with the latest NEMA MG-1, Section IV, Part 31.
  - 2. Motors shall have service factor not less than 1.0 at rated load.
  - 3. Insulation shall be Class F or H.
  - 4. Furnish each motor with shaft grounding ring utilizing conductive microfiber similar to AEGIS SGR to protect motor bearings from electrical damage.
- g. Vibration shall not exceed 0.15" per second, unfiltered peak unless otherwise noted.
- h. Motors (180 frames and larger) shall have provisions for lifting eyes or lugs capable of safety factor of 5.
- i. Full load nominal efficiency of motors 1 hp and larger, except special-purpose motors including 2-speed or multi-speed motors, and rewind motors, shall meet or exceed listed values when tested in accordance with IEEE Standard 112 Method B as defined by NEMA Standard MG 1-12.6C. Efficiency values listed are based on NEMA Premium Efficiency Electric Motors of NEMA MG 1-2011, Table 12-12.

	<u>Open Drip-Proof Motors</u>			<u>Totally Enclosed Fan-Cooled Motors</u>		
	1200 rpm	1800 rpm	3600 rpm	1200 rpm	1800 rpm	3600 rpm
hp	(6 pole)	(4 pole)	(2 pole)	(6 pole)	(4 pole)	(2 pole)
3 hp	88.5	89.5	85.5	89.5	89.5	86.5
5 hp	89.5	89.5	86.5	89.5	89.5	88.5
7.5 hp	90.2	91.0	88.5	91.0	91.7	89.5
10 hp	91.7	91.7	89.5	91.0	91.7	90.2
15 hp	91.7	93.0	90.2	91.7	92.4	91.0
20 hp	92.4	93.0	91.0	91.7	93.0	91.0

- j. Single-phase motors for hard starting applications including outdoor applications shall be capacitor start type. Motors for fans and pumps located indoors may be split phase or permanent split-capacitor. Motors shall be equipped with permanently lubricated and sealed ball bearings and shall be selected for quiet operation. Motors 1/8 hp and below may be shaded pole type.
  - 1. Refer to individual equipment section for additional requirements or specific type of motors.
- k. 3 Ph, 2-speed motors shall be one winding, consequent pole, variable torque type and 1 Ph, 2-speed motors shall be capacitor start capacitor run type.
- l. When submersible pumps are specified, each pump shall include in addition to controls specified, all necessary controls, relays, wiring, etc. that may be required for safety features incorporated in motor design. No submersible motor shall be run or activated until all requirements of motor manufacturer's recommendations have been complied with.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- a. Install materials in accordance with drawings, approved Shop Drawings and manufacturer's recommendations.

**END OF SECTION**

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**SECTION 20 0529**

**PIPING AND EQUIPMENT SUPPORTING DEVICES**

**PART 1 - GENERAL**

**1.01 RELATED WORK**

- a. Section 20 0700 - Mechanical Systems Insulation

**1.02 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.03 DESCRIPTION**

- a. Provide all supporting devices not provided as part of building structure or indicated on structural drawings or structural details, as specified and as required for proper supporting, anchoring, and guiding of piping, equipment, materials and systems.
- b. Support for all conditions of operation, including variations in installed and operating weight of equipment, piping and ductwork, to prevent excess stress and allow for proper expansion and contraction.

**1.04 SUBMITTALS**

- a. Shop Drawings for each piping system for all pipe sizes and all applicable equipment including, but not limited to, the following:
  - 1. Manufacturer's name
  - 2. Model numbers
  - 3. Materials of construction and load ratings (lbs.)
  - 4. Schedule of hangers and support devices with pipe support spacing
  - 5. Insulated pipe supports along with application chart or table including pipe support spacing.
  - 6. Insulation protection saddles and weight bearing insulation table
  - 7. Details and calculations for sizing supplementary steel utilized for trapeze or specially designed supports
  - 8. Structural attachments, inserts, and concrete anchors. Submit ICC-ES Evaluation Report for each type of anchor.
  - 9. Calculations and drawings for concrete inserts and anchors for each application
  - 10. Drawings showing specific locations of any weld attachments to structure, including weight supported by such attachments
  - 11. Drawings showing specific locations of any suspended loads which exceed 100 lbs. within joist chord panel to be attached to open web steel joist structural members. Include weight supported by such attachments. (Panel is length of chord between two adjacent diagonal web members at point of connection to chord.)
  - 12. Equipment mounting devices
  - 13. All other appropriate data

**1.05 DESIGN CRITERIA**

- a. Materials and application of pipe hangers and supports shall conform to the latest requirements of ANSI/ASME B31 Code for Pressure Piping and MSS Standard Practice SP-58-2018 (Pipe Hangers and Supports Materials, Design, Manufacture, Selection, Application, and Installation), except as supplemented or modified herein.
- b. Support materials shall be steel or stainless steel unless specifically indicated.
- c. Support devices shall be factory fabricated and have published load ratings.
- d. Unless otherwise indicated, design supports, anchors, and related components with safety factor in accordance with AISC Manual of Steel Construction, but not less than 2.0.
- e. Determine maximum deflection using the following equation.

$$D = \frac{H \text{ or } L}{250}$$

Where D = Max deflection in inches  
 H = Member height in inches  
 L = Member length in inches

- f. Unless otherwise indicated, hangers, support devices and hardware shall be steel and shall have factory standard black, primed, galvanized or electroplated finish for indoor application, and hot-dipped galvanized finish for outdoor application and corrosive atmospheres. Coat cut edges, welds or any damaged finish with galvanized paint.
  - 1. Corrosive atmospheres include the following locations:
    - a. Exterior locations
    - b. Chemical storage and hazardous waste storage rooms
    - c. Food service/kitchen areas
    - d. Locker/shower rooms
    - e. Meter pits
    - f. Utility tunnels
    - g. Cage wash room (dirty and clean)
    - h. Sterilizer/autoclave room
- g. Materials in contact with pipe shall be galvanically compatible with piping material to eliminate conductive path for galvanic corrosion. Where piping and support materials have galvanic potential, Provide galvanic separation, such as nonmetallic coating or inserts between piping and metallic supports. Pipe insulation is acceptable galvanic separation. Materials in contact with pipe shall be galvanically compatible with piping material to eliminate conductive path for galvanic corrosion. Where piping and support materials have galvanic potential, provide galvanic separation, such as nonmetallic coating or inserts between piping and metallic supports. Pipe insulation is acceptable galvanic separation. Galvanic potential shall be determined by table below:

	<b>Galvanized Steel</b>	<b>Carbon Steel</b>	<b>Stainless Steel (Type 304 or 316)</b>	<b>Copper Brass Bronze</b>
<b>Copper,</b>	Yes	Yes	No	NA



<b>Brass, Bronze</b>				
<b>Stainless Steel (Type 304 or 316)</b>	Yes Note (1)	Yes Note (1)	NA	
<b>Carbon Steel</b>	No	NA		
<b>Galvanized Steel</b>	NA			

(1)Required where stainless steel surface area near interface is equal or greater than steel surface area

- h. Unless otherwise indicated, steel support devices exposed to ventilation air stream shall be stainless steel or steel with either galvanized finish or paint finish. Paint type shall be approved by Architect/Engineer.
- i. This Contractor is responsible for proper placement and sizing of supporting devices to accommodate insulation thickness and pitching of pipe. Coordinate with Contractor performing work specified in Section 20 0700 - Mechanical Systems Insulation.
- j. In addition to hangers specified in this Section, piping connected to pumps, compressors, and similar rotating or reciprocating equipment shall have vibration isolation hangers or supports for specified distance from such equipment. Refer to Section 23 0550 – Vibration Isolation for required distance.
- k. Piping connected to coils, which are in assembly mounted on vibration isolators, shall have vibration isolation hangers or supports as indicated above. Piping connected to coils, which are in equipment where fan assembly is separately isolated by vibration isolators and flexible connections, does not require additional vibration isolation hangers or supports. Refer to Section 23 0550 - Vibration Isolation for flexible connections, vibration isolators and additional requirements.
- l. Where piping can be conveniently grouped to allow trapeze type supports, supporting steel shall be by means of standard structural shapes.
- m. Hangers and rods shall be plumb when pipelines are at their normal operating temperatures.
- n. Unless otherwise indicated, continuous insert channels are not allowed.
- o. Punching, drilling, or welding of building structural steel is not allowed unless approved by Structural Engineer.
- p. Refer to Structural Documents and ICC-ES Evaluation Report for application of concrete inserts and concrete anchors.
- q. Lateral braces shall be designed and detailed to apply loads as directly as possible to structural floor slabs, roof decks, or other building lateral elements. Braces shall not be applied to bottom flanges of steel beams or bottom chords of open web steel joists.
- r. Coordinate with General Contractor for any proposed weld attachments to building structure. This may result in use of welding codes or standards, which may apply to "structural work". and may necessitate repair of fireproofing and/or extension of fireproofing to support

members. Execution of this work may be assigned to General Trades responsible for building structural steel. Cost for this work, however, will remain the responsibility of this Contractor.

- s. Top or bottom chords of open web steel joists may be used to support loads, provided total load within panel does not exceed 100 lbs. and load is placed concentric to joist. (Panel is length of chord between two adjacent diagonal web members at point of connection to chord).
- t. Where fire rated fiberglass products are used for channel and support devices, the following properties shall apply:
  - 1. Flame Spread Properties
    - a. Polyester Fiberglass (PF) Class 1 ASTM E-84
    - b. Vinylester Fiberglass (VF) Class 1 ASTM E-84
- u. Fasteners including concrete anchors for seismic application shall have ICC Evaluation Service Report (ESR) and meet requirements of local authorities.

**PART 2 - PRODUCTS**

**2.01 STRUCTURAL SUPPORTS**

- a. Unless specifically indicated on structural drawings, design and provide all supporting devices including miscellaneous steel (angles, channels, beams, etc.), required for proper support of piping, equipment and materials.

**2.02 PIPE HANGERS AND SUPPORTS (METALLIC)**

- a. Manufacturers: Anvil, Erico, Tolco, PHD, National Pipe Hanger Corporation, or B-Line, equal to Anvil figures listed. Corresponding MSS Type is indicated where applicable.
- b. Clevis and Roller Type Hangers:

<u>System</u>	<u>Pipe Size</u>	<u>Clevis</u>	<u>Roller</u>
Ambient Bare Pipes (61°F to 104°F)	2" and smaller	65 (MSS Type-1), 260 (MSS Type-1)	---
	2-1/2" and larger	260 (MSS Type-1), 216 (MSS Type-4)	---
Cold Pipes with Insulation (33°F to 60°F)	2" and smaller	65 (MSS Type-1), 260 (MSS Type-1)	---
	2-1/2" and larger	260 (MSS Type-1), 295 (MSS Type-1)	---

- 1. For pipe size 2-1/2" and larger, where there is transverse movement at support points due to thermal expansion/contraction, clevis type hangers similar to Anvil Figure 260 (MSS Type-1) may be used if vertical angle of hanger rod is less than 4°.
- c. Flat Surfaces (Trapeze, Rack Type):
  - 1. Use structural steel members such as struts, angles, channels and beams to support pipes as required. Select members properly for pipe support types and loading conditions. Refer to Part 1 for design criteria. Submit support details with type of members selected and load calculations. Provide straps, clamps, rollers or slides indicated below at each support point.

<u>System</u>	<u>Pipe Size</u>	<u>Straps or Clamps</u>	<u>Rollers</u>	<u>Slides</u>
Ambient Bare Steel Pipes (61°F to 104°F)	6" and smaller 8" and larger	B-Line BVT Unistrut Cush-a-Clamp	---	---
Ambient Bare (Copper) pipes (61°F to 104°F)	all sizes	B-Line BVT Unistrut Cush-a – Clump		
Cold Pipes with Insulation (33°F to 60°F)	10" and smaller	137 (MSS Type-24) 432	---	---
	12" and larger		171 or 177 (MSS Type-41), 271 (MSS Type-45), 274 (MSS Type-46)	257 or 436 with 212 or 432 clamps, Type 1, 2 or 3 for longitudinal movement only and Type 4, 5 or 6 for both longitudinal and transverse movement.

d. Vertical Pipe within Wall Cavities

1. Use clamps, straps, inserts or channels to support pipes concealed in wall cavity. Select members for pipe support types and loading conditions. Refer to Part 1 for design criteria.
2. Provide clamps, strut channels, insulated supports, or brackets and inserts equal to manufacturer indicated below:

<u>System</u>	<u>Pipe Size</u>	<u>Supports</u>	<u>Clamps, Brackets/Inserts</u>	<u>Pre-insulated Inserts</u>
Hot and Cold Pipes with Insulation	All sizes	Anvil 137	HoldRite 260 series with SBIS bracket, Anvil 262	Anvil Klo-Sure, Pipe Shields A2000
Ambient Bare Steel Pipes (61°F to 104°F)	All sizes	Anvil 137, 138-R	Anvil 262	---
Ambient Bare Copper Pipes (61°F to 104°F)	All sizes	Anvil CT-138R	HoldRite 260 series with SBIS bracket	---

**2.03 INSULATION PROTECTION SHIELDS**

- a. Anvil Fig. 167 (MSS Type-40) constructed of galvanized carbon steel. Per the latest edition of Standard MSS SP-58, select shield to accommodate outer diameter of insulation. Shield length and gauge for insulation compression strength not less than 15 psi, shall be as follows:

<u>Pipe Size</u>	<u>Length</u>	<u>Gauge</u>
1/4" thru 3"	12"	18
4"	12"	16
5" and 6"	18"	16
8" thru 14"	24"	14
16" thru 24"	24"	12

**2.04 INSULATED PIPE SUPPORTS**

a. Description:

1. Products designed specifically for weight-bearing support of insulated pipes. Apply products in accordance with manufacturer's recommendations and requirements indicated below:
2. Refer to PART 3 – EXECUTION for application of Type A, Type B, and Type C Insulated Pipe Supports specified below.

b. General:

1. Supports shall be designed and rated for applied load, including weight of pipe, fluid, insulation, and any other imposed loads, with minimum 1.5 safety factor. Ratings shall be published by manufacturer and included in submittals.
2. Load ratings shall be established by pipe support manufacturer based upon testing and analysis conforming to the latest editions of ASME B31.1 and MSS SP-58.
3. High compressive strength inserts utilized to support loads shall encircle circumference of pipe. Block-style inserts are not allowed.
4. Supports shall be suitable for hot or cold pipe service as applicable.
5. Submit chart or table indicating selected model along with pipe sizes, rated loads, support device types and support spacing for each piping system.
6. Pipe support spacing shall be in accordance with manufacturer's recommendations but shall not exceed maximum spacing indicated under Hanger and Support Spacing in Part 3 of this Section.
7. Testing of insulation for compressive strength properties shall comply with ASTM D1621.
8. Insulation thickness shall match adjacent pipe insulation thickness.
9. Integrity of vapor barrier jacket shall be maintained continuously through support assembly.
10. Insulated pipe support style shall be specifically selected for the application and shall consider the following criteria at minimum:
  - a. Vertical, lateral and axial support design load limits.
  - b. Vertical, lateral, and axial support design travel limits
  - c. Temperature of support, at pipe surface, and ambient conditions
  - d. Test or pre-operational loads that may exceed normal operating conditions
  - e. Material for any items that will be welded directly to the pipe
  - f. Loading and displacements caused by seismic, hydraulic surge, or other forces
  - g. Temperature at support steel
11. All steel components shall have corrosion protection coating consisting of hot-dip galvanizing or zinc-rich primer coating.

c. Type A Insulated Pipe Supports (Light Duty)

1. Description:

- a. Pipe insulation specified in Section 20 0700 – Mechanical Systems Insulation with insulation protection shields specified in this Section. Weight-bearing inserts are not required.
  - b. Type B or Type C supports may be utilized in lieu of Type A supports.
- d. Type B Insulated Pipe Supports (Standard Duty):
1. Manufacturers:
    - a. SNAPP ITZ insulation inserts by KB Enterprise, Tru-Balance Insulated Saddles by Buckaroos, Inc., Value Engineered Products, or approved equal.
    - b. Klo-Shure insulation couplings may be used for cold pipes insulated with elastomeric insulation. Mount shall be 7 Series Strup Mount with metal clamps or Clevis System for clevis hangers.
    - c. Type C supports may be utilized in lieu of Type B supports”
    - d. Contractor may propose to utilize contractor-fabricated insulated pipe supports in lieu of manufactured Type B Supports. Use of contractor-fabricated assemblies is subject to approval of appropriate submittal data. Submit detail drawings of assemblies and product data showing equivalency to specified manufactured products for approval.
  2. Description:
    - a. Load-rated assembly consisting of high compressive strength insulation material completely encompassing circumference of pipe, vapor barrier jacket, and insulation protection shield.
    - b. Insulation protection shield shall conform to ANSI/MSS SP-58. Shield shall be G90 galvanized steel and shall span full circumference of pipe insulation. Half-shields spanning lower 180° arc of insulation outer circumference will be acceptable when used with clevis hangers.
    - c. Axial length of insulation material shall be not less than 9” or 2” longer than insulation protection shields (1” minimum on each end), whichever is longer.
  3. Insulation Materials:
    - a. Cold Pipes (60°F and below:
      - 1). Rigid closed cell, polyisocyanurate, phenolic insulation similar to ITW, Resolco, Kingspan, or cellular glass insulation similar to Pittsburgh Corning Foamglas.
- e. Type C Insulated Pipe Supports (Heavy Duty):
1. Manufacturers:
    - a. Pipe Shields, Inc., Bergen Pipe Supports, or Rilco equal to Pipe Shields models listed.
    - b. Unless otherwise indicated, pre-insulated pipe supports shall be as indicated in the following schedule. Model numbers are based on Pipe Shields, Inc.
      - 1). Pipe supported on hangers: Model “A” Series and Model “D” Series
      - 2). Pipe supported on flat surfaces and pipe rollers: Models “A” Series
      - 3). Pipe supported on slides: Model “B” Series with lateral guide or restraint
      - 4). Pipe anchors: Model “C” Series
      - 5). Riser clamps: Model “E” Series with thrust plates. Select proper model for restraint for downward load or upward load.
    - c. Contractor may propose to utilize contractor-fabricated insulated pipe supports in lieu of manufactured Type C Supports. Use of contractor-fabricated assemblies is subject to approval of appropriate submittal data. Submit detail drawings of assemblies and product data showing equivalency to specified manufactured products for approval.
  2. Description:

- a. Load-rated assembly consisting of high compressive strength insulation material completely encircling circumference of pipe, vapor barrier jacket system incorporating structural inserts and insulation protection shield/casing where applicable.
- 3. Insulation Material:
  - a. Water-resistant high density calcium silicate with minimum density of 13 lb/ft<sup>3</sup> and compressive strength not less than 100 psi. Thermal conductivity shall be not more than 0.38 Btu·in/(hr·ft<sup>2</sup>·°F) at 75°F)
  - b. Structural Inserts:
    - 1). Structural inserts used by manufacturer to reinforce between pipe and insulation jacket for clamping devices shall be water-resistant high compressive strength inorganic materials selected by manufacturer for desired combination of structural strength and insulating properties. Structural inserts shall have minimum compressive strength of 600 psi. Thermal conductivity shall be not more than 0.58 Btu·in/(hr·ft<sup>2</sup>·°F) at 75°F).
  - c. Jacket:
    - 1). Jacket shall consist of G90 galvanized steel conforming to ASTM A-653 and shall provide complete vapor barrier around insulation and bearing surface for protection of insulation.
    - 2). When recommended by manufacturer, use reinforced insulation protection shield at support bearing surface. Insulation shall extend 1" beyond insulation protection shield to maintain vapor barrier integrity.

**2.05 HANGER RODS (METALLIC)**

- a. Rods shall conform to the latest MSS Standards except as modified herein. Furnish rods complete with adjusting and lock nuts.
- b. Rods shall have electroplated zinc or hot dip galvanized finish.
- c. Unless otherwise indicated, size rods for individual hangers and trapeze support as indicated in the following schedule. Rod size may be reduced one size for double rod hangers. Total weight of equipment, including valves, fittings, pipe, pipe content and insulation, shall not exceed limits indicated.

<u>Max. Pipe Size With Single Rigid Rod</u>	<u>Rod Diameter (inches)</u>	<u>Max Load (lbs.) of Hanger Rod (Not exceeding 650°F Service Temp.)</u>
2"	3/8	730
3"	1/2	1350
5"	5/8	2160
8"	3/4	3230
12"	7/8	4480
18"	1	5900
30"	1-1/4	9500

**2.06 BOLTS, NUTS, STUDS AND WASHERS**

- a. ASTM A307, electroplated zinc finish

**2.07 ROD ATTACHMENTS**

- a. Anvil Fig. 290 (MSS Type-17), galvanized finish

**2.08 U-BOLTS**

- a. Anvil Fig. 137 (MSS Type-24), galvanized finish

**2.09 BEAM CLAMPS**

- a. Beam Clamps: Anvil Fig. 133/134 (MSS Type-21), 218 (MSS Type-30), 228 (MSS Type-28 or 29) and 292 (MSS Type-28 or 29)
- b. Top Beam Clamps: Anvil Fig. 227 (MSS Type-25)
- c. C-Clamps: Anvil Fig. 86, 92 or 93 (MSS Type-19 or 23) with set screw and lock nut

**2.10 ADJUSTABLE PIPE SADDLE SUPPORTS**

- a. Anvil Fig. 264 (MSS Type-38), galvanized finish. Provide Anvil Fig. 63 Type T stanchion with base, galvanized finish, where applicable.

**2.11 RISER CLAMPS (BARE PIPE)**

- a. Anvil Fig. 261 (MSS Type-8), galvanized finish
- b. B-Line B3373C, PVC coated carbon steel, in area at pipe contact, for bare copper tubing
- c. Proset system, proseal plug and fire-fill for sleeved and cored holes.

**2.12 RISER CLAMPS (INSULATED PIPE)**

- a. Unless otherwise indicated, insulated pipe riser clamps shall be Type C insulated pipe supports. Refer to Insulated Pipe Supports in Part 2.
- b. Contractor may propose to utilize contractor-fabricated riser supports. Use of contractor-fabricated riser supports is subject to approval of appropriate submittal data. Submit support detail drawings, bearing stamp of Structural Engineer registered in project jurisdiction, for approval. Supports shall be engineered to withstand static and dynamic forces with minimum safety factor of 2.0. Submit insulation details addressing thermal break from building structure and vapor barriers.

**2.13 CONCRETE INSERTS (WOODEN FORMED CONCRETE)**

- a. Anvil Fig. 281 or 282, or Hilti HCI-WF (MSS Type-18), suitable for rod diameter and weight supported.

**2.14 CONCRETE INSERTS (METAL DECK FORMED CONCRETE)**

- a. Anvil Fig. 284, Tolco No. 109DD, B-Line Fig. B3019, DeWalt/Powers "Bang-It+", Hilti HCI-MD, or MSCO No. MX34.

**2.15 CONCRETE ANCHORS**

- a. Manufacturers: Hilti, DeWalt/Powers or Red Head
- b. Anchors shall be selected, sized, and detailed by Contractor's structural engineer registered in project's jurisdiction, based on project conditions and in accordance with project building code. Calculations and drawings shall be submitted.
- c. Anchors shall meet ICC Acceptance Criteria, and ICC-ES Evaluation Reports (ESRs) shall specifically list the current applicable codes.



- d. Anchors installed in hardened concrete for purpose of transmitting structural loads from one connected element to another, or for safety related elements such as sprinkler pipes, heavy suspended pipes, and barrier rails shall have ICC-ES report demonstrating anchors have met requirements of AC 193 for mechanical anchors in concrete elements.
- e. Post-installed expansion anchors and undercut anchors installed in hardened concrete shall be qualified for strength design and tested according to ACI 355.2. Designs shall be per the requirements of ACI 318, Appendix D.
- f. Anchors for seismic load application shall be approved by ICC-ES Evaluation Reports to resist seismic loads and selected to meet project seismic design requirements. Refer to Section 20 0549 – Seismic Anchorage and Restraints and Structural drawings.
- g. Anchors shall be zinc plated in accordance with ASTM B633.
- h. Select anchors with load ratings based on cracked concrete conditions.

#### **2.16 METAL FRAMING SUPPORT SYSTEM (STRUT SYSTEM)**

- a. Manufacturers: Unistrut, B-Line Strut Systems, Anvil-Strut, Power-Strut, Erico, Superstrut, Kindorf, Hilti, and Hydra-Zorb
- b. Channels shall have epoxy paint or electroplated zinc finish.
- c. Channels shall not be lighter than 12 ga.

#### **2.17 PIPE MOUNTING PEDESTALS**

- a. Equal to Roof Products & System Corporation consisting of equipment rail, "U" shaped mounting brackets, galvanized threaded rod and cast iron pipe rollers. Rail shall have built-in raised cant to match roof deck insulation.

#### **2.18 EQUIPMENT RAILS**

- a. Manufacturers: Roof Products & Systems, ThyCurb, Custom Curb, Inc. or Vent Products equal to Roof Products & Systems Model ER-4 with raised cant style. Mounting rails shall be galvanized steel with integral base plate, continuous welded corner seams, factory installed 2x4 wood nailer and 18 ga galvanized steel counter flashing.
- b. Mounting rail gauge shall be selected to support equipment adequately but shall be not less than 18 ga.
- c. Height shall be as detailed, but not less than 8" above finished roof.
- d. Equipment rails shall span minimum of 2 joists and not cantilever more than 6" where joists are used. Rails shall be level at top with pitch built in when deck slopes 1/4" per foot or greater.

#### **2.19 FIXTURE SUPPLY SUPPORT**

- a. Galvanized steel stud support bracket, pre-drilled tube support mounting holes, adjustable stud width, Erico TSGB or equal.
- b. UV resistant nylon tube support, rated for 0°F through 130°F, resealable locking mechanism, Erico TPC or equal.
- c. Support bracket and tube support to be from same manufacturer.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- a. Install supports to allow for free expansion of piping. Support piping from building structural members using concrete inserts, beam clamps, ceiling plates, wall brackets, or floor stands. At no time shall hangers and supports overload building structural members. Fasten ceiling plates and wall brackets securely to structure and test to demonstrate adequacy of fastening.
- b. Select and size building attachments properly in accordance with MSS Standards and manufacturer's published load rating information.
- c. Coordinate hanger and support installation to properly group piping of all trades.
- d. Suspend piping hangers by means of hanger rods. Perforated band iron and flat wire (strap iron) are not allowed.
- e. Piping and ductwork shall be supported independently from other piping or ductwork.
- f. Pipe hangers and supports shall not penetrate vapor barrier of pipe insulation.
- g. Do not support equipment, or piping from metal roof decking or ceiling grid.
- h. Install adequate supports so as not to over stress either piping or equipment to which piping is connected.
- i. Refer to Section 20 0000 - General Mechanical Requirements for requirements of personnel injury protection guards for supporting devices.

**3.02 HANGER AND SUPPORT SPACING**

- a. Space pipe hangers and supports for horizontal pipe accordance with the following schedule, with exceptions as indicated herein:
- b. Steel Pipe (Standard Weight and Extra Strong):

<u>Pipe Size</u>	<u>Max Spacing</u>
1-1/4" and smaller	7'-0"
1-1/2"	9'-0"
2"	10'-0"
2-1/2"	11'-0"
3"	12'-0"
4"	14'-0"
6"	17'-0"
8"	19'-0"
10" and larger	20'-0"

- c. Steel Pipe (Standard Weight and Extra Strong):

<u>Pipe Size</u>	<u>Max Spacing</u>
1-1/4" and smaller	7'-0"
1-1/2"	9'-0"
2"	10'-0"
2-1/2"	11'-0"
3" and larger	12'-0"

d. Copper Tube (Unless Otherwise Noted):

<u>Pipe Size</u>	<u>Max Spacing</u>
3/4" and smaller	5'-0"
1" to 1-1/4"	6'-0"
1-1/2" to 2-1/2"	8'-0"
3" and larger	10'-0"

e. Copper Tube (Domestic Water, Laboratory Water, Non-potable Water):

<u>Pipe Size</u>	<u>Max Spacing</u>
1-1/4" and smaller	6'-0"
1-1/2" and larger	10'-0"

f. Copper Tube (Domestic Water, Laboratory Water, Non Potable Water):

<u>Pipe Size</u>	<u>Max Spacing</u>
1-1/2" and smaller	6'-0"
2" and larger	10'-0"

g. Plastic Pipe

1. PVC Pipe:

<u>Pipe Size</u>	<u>Max Spacing</u>
All sizes	4'-0"

2. CPVC Pipe:

<u>Pipe Size</u>	<u>Max Spacing</u>
1" and smaller	3'-0"
1-1/4" and larger	4'-0"

3. PP-R Pipe (Potable and Nonpotable Water):

<u>Pipe Size</u>	<u>Max Spacing</u>
2" and smaller	4'-0"
3"	6'-0"

4. PEX-a Pipe (Potable and Nonpotable Water):

<u>Pipe Size</u>	<u>Max Spacing</u>
3" and smaller	2'-8"

- a. Pipe can be supported with PEX-a Pipe Channel as an alternate. Spacing for supports with pipe channel shall be 6' for pipes 3/4" and smaller and 8' for pipes 1" and larger.
  - b. Provide copper tube size riser clamps at base of each floor and at top of every other floor with mid-floor guides for hot water systems.
  - c. Provide copper tube size riser clamps at base of each floor and top of every 4 floors with mid-floor guides for cold water systems.
5. Support plastic pipe at all changes of direction. Adequate consideration shall be given to piping expansion.

- h. Cast Iron Pipe:
  - 1. Maximum hanger and support spacing shall be 10 ft. for all pipe sizes. Provide minimum of one hanger per pipe section close to joint on barrel, at each pipe fitting, at change of direction and branch connections.
  - 2. Support Cast Iron No-Hub pipe as recommended in CISPI Publication "Cast Iron Soil Pipe and Fittings Handbook, Chapter IV - Installation of Cast Iron Soil Pipe and Fittings."
- i. Maximum spacing shown above may be restricted by strength of attachment to building structure. Submit data with calculations with published load ratings showing attachment to be utilized and maximum spacing allowable for that type of attachment and pipe size.
- j. Spacing less than indicated above may be required to conform to building structure design or loading limitations.
- k. Spacing less than indicated may be required depending on compressive strength of pipe insulation and insulated pipe supports.
- l. If pipe size changes between support points, maximum spacing shall be based on the smaller pipe size.
- m. If trapeze hangers are used to support multiple services, spacing shall be based on the most restrictive pipe size and material on trapeze hanger.
- n. For non-metallic pipe, follow manufacturer's installation recommendations in addition to requirements noted herein.
- o. Install supports for vertical piping and anchors as recommended by pipe manufacturer.
- p. Place hangers and supports to meet requirements of Section 23 2116 - Pipe and Pipe Fittings or specific pipe system sections, with regard to pitch for drainage and venting and clearance between services.
- q. Hangers and supports shall bear on outside of insulation when pipes are to be insulated.
- r. Place hangers and supports within 1 ft. of each fitting, such as elbows and tees, and at each valve, strainer, and other piping specialty for piping 4" and larger.
- s. Place hanger or support at first elbow upstream of pump inlet and first elbow downstream of pump outlet.

### **3.03 RISER SUPPORTS**

- a. Insulated Piping:
  - 1. Unless otherwise indicated, support vertical piping as indicated below:
  - 2. Support vertical piping at bottom of riser, secured and anchored to building structure. Provide guides on vertical piping. Use spring hangers at top of riser and at take offs from riser at each floor. Use spring hangers for minimum 3 hangers away from top and bottom elbows and from each take off at riser.
- b. Bare Piping:
  - 1. Unless otherwise indicated, maximum vertical support spacing for ambient bare steel and cast iron pipes shall be 15 ft.
  - 2. Maximum vertical support spacing for other piping including copper tubing and plastic piping shall be 10 ft.
  - 3. Install riser clamps and intermediate supports as required.

4. Rest riser clamps on floor or on pipe sleeve.

### **3.04 INSULATED PIPE SUPPORTS APPLICATION**

- a. Install insulated pipe support at each support point of insulated pipe.
- b. Pipe Size 1-1/2" and Smaller:
  1. Use Type A insulated pipe support. Pipe insulation specified in Section 20 0700 - Mechanical Systems Insulation shall be continuous through support points.
  2. Use one shield (bottom) for clevis hanger.
  3. Use 2 shields (top and bottom) for roller hanger/support or strap/clamp support. Apply 2 metal straps to hold top and bottom shields onto insulation jacket.
  4. Type B or Type C insulated pipe supports may be used in lieu of Type A support.
- c. Pipe Size 2" through 5":
  1. Use Type B insulated pipe supports. Refer to Part 2 for acceptable products.
  2. Type C insulated pipe supports may be used in lieu of Type B supports.
- d. Pipe Size 6" and Larger:
  1. Use Type C insulated pipe supports. Refer to Part 2 for applicable products.

### **3.05 PIPE FLOOR SUPPORTS**

- a. Unless specifically shown otherwise, use adjustable pipe saddle supports with associated stanchion similar to Anvil Fig. 264/63. Select supports properly for weight and height of pipe stand.

### **3.06 CONCRETE INSERTS**

- a. Concrete insert application, size, loading, and placement shall be this Contractor's responsibility.
- b. Coordinate with General Contractor for placement of inserts before concrete pour. Minimize use of inserts and anchors after concrete pour.

### **3.07 BEAM CLAMPS**

- a. Provide locknut for hanging rod at clamp.
- b. C-clamps are allowed for rod size 3/8" or smaller and only for static loading such as air piping, cold water piping, fire protection piping and, other similar piping.
- c. C-clamps are not allowed for open web steel joist application.
- d. C-clamps are not allowed for seismic application.

### **3.08 TRAPEZE SUPPORTS**

- a. Construct trapeze supports with struts, angles, or channels and hang them by inserts or welded beam attachments and rods.
- b. Determine trapeze supports spacing by the smallest pipe on trapeze.

**3.09 PIPE MOUNTING PEDESTALS**

- a. Use for all piping on roof. Install bottom of pedestal flat on roof deck, insulate exterior of pedestal, flash and counter flash.

**3.10 EQUIPMENT RAILS**

- a. Use for all roof-mounted equipment, which is not curb mounted. Install bottom of equipment rail flat on roof deck. Insulate exterior of equipment rail.
- b. Flashing will be by General Contractor. Provide counter flashing as specified and secure to wood nailer with stainless steel truss head screws.

**3.11 CONCRETE ANCHORS**

- a. Anchor application, size, and placement shall be this Contractor's responsibility.

**END OF SECTION**

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**SECTION 20 0553**

**MECHANICAL SYSTEMS IDENTIFICATION**

**PART 1 - GENERAL**

**1.01 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.02 SUBMITTALS**

- a. Product Data: For identification materials and devices
- b. Valve Schedules: For each piping system

**PART 2 - PRODUCTS**

**2.01 IDENTIFYING DEVICES**

- a. Marker System:
  - 1. Manufacturers: Brady USA, Marking Services Inc. (MSI), Kolbi, or Seton
  - 2. Manufacturer's standard, preprinted with color coding, lettering size and length of color field according to ASME A13.1.
  - 3. Use pressure-sensitive type or "snap-on" type.
  - 4. "Strap-on" type may be used for piping over 6" size including insulation.
- b. Valve Tags:
  - 1. Minimum 1-1/2" diameter, 0.032" thick, polished brass or 316 stainless steel.
- c. Laminated Plastic Nameplates:
  - 1. Nameplates shall be approximately 1-1/2" x 4", 1/16" thick, and have 1/2" high lettering. Face of plastic nameplates shall be black with white letters.
  - 2. Fasteners shall be self-tapping, stainless steel screws or contact type with permanent adhesive.

**PART 3 - EXECUTION**

**3.01 GENERAL**

- a. After painting and/or covering is completed, identify equipment and piping as indicated. Locate identification as conspicuously as possible except where such would distract from finished area.
- b. Where markers are used in high heat applications or exposed to harsh chemical or acid environments, specifically select marker materials for those applications.
- c. Coordinate, obtain and confirm mechanical systems identification criteria and requirements from Owner.

**3.02 PIPING SYSTEM IDENTIFICATION**

- a. Install pipe identification on each system.
- b. Place flow directional arrows at each pipe identification location.
- c. Identify all piping (except medical gas) not less than once every 25 ft., not less than once in each room, at each branch, adjacent to each access door or panel, at each valve and where exposed piping passes through walls and floors.
- d. Identify piping by stenciling. Height of lettering shall be same as pipe diameter up to maximum of 1" in height. When finished color of piping is dark, stenciling shall be on white background.
- e. Identify piping with marker system.
  1. For "strap-on" type, ensure marker is fitted snugly to pipe or pipe insulation surface with sufficient straps.

**3.03 VALVE IDENTIFICATION**

- a. Identify valves with brass tags bearing system identification and valve sequence number in 1/2" black characters. Attach tag to valve body with brass jack chain and "S" hook for brass tag and SS jack chain or SS braided wires with swag sleeves and "S" hook for stainless steel tag. Non-metallic fasteners are not allowed.
- b. Valve numbers shall be prefixed with corresponding piping system identification in 1/4" black letters.
- c. Valve tags are not required at terminal devices unless valves are greater than 10 ft. from device or located in another room not visible from terminal unit.
- d. Furnish typewritten valve schedule indicating valve number, fixtures, equipment or areas served by each numbered valve and incorporate in O&M Manuals.

**3.04 EQUIPMENT IDENTIFICATION**

- a. Identify major equipment, including cooling tower, fans, pumps, etc.
- b. Identify equipment by stenciling equipment number and service in 2" high letters.
- c. Identify equipment with marker system.
- d. Identify equipment with laminated plastic nameplates.
- e. Identify control equipment and panels with laminated plastic nameplates.
- f. Nameplate Markings:
  1. Identify model number, size, capacity, electrical characteristics, serial number, along with other items scheduled for equipment on drawings.
  2. Indicate motor horsepower, voltage, phase, cycles, RPM, full load amps, locked motor amps, frame size, manufacturer's name and model number, Service Factor, Power Factor, efficiency, minimum circuit amps, minimum feeder conductor size, disconnect or fuse size, refrigerant, and other pertinent information.
- g. Locate motor nameplates for easy reading. Relocate or provide new nameplates on motors if original nameplates are not located for easy reading.



**END OF SECTION**

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**SECTION 20 0700**

**MECHANICAL SYSTEMS INSULATION**

**PART 1 - GENERAL**

**1.01 RELATED WORK**

- a. Section 20 0529 - Piping and Equipment Supporting Devices

**1.02 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.03 DESCRIPTION**

- a. Provide insulating materials and accessories as required for mechanical systems as specified below.
- b. Insulating products delivered to construction site shall be labeled with manufacturer's name and description of materials.

**1.04 DEFINITIONS**

- a. Concealed areas, where indicated in this Section, shall apply to shafts, furred spaces and space above finished ceilings, inaccessible tunnels and crawl spaces. All other areas, including walk-through tunnels, shall be considered as exposed.
- b. Unless otherwise indicated, unit of thermal conductivity is Btu-in/(h·ft<sup>2</sup>·°F).

**1.05 SUBMITTALS**

- a. Shop Drawings for each piping system for all pipe sizes, each ductwork system, and all equipment including, but not limited to, the following:
  - 1. Manufacturer's name
  - 2. Schedule of insulating materials
  - 3. Insulation material and thickness
  - 4. Jacket
  - 5. Adhesives
  - 6. Fastening methods
  - 7. Fitting materials
  - 8. Intended use of each material
  - 9. Manufacturer's data sheets indicating density, thermal characteristics, temperature ratings
  - 10. Insulation installation details (manufacturer's installation instruction/details, Contractor's installation details, MICA plates where applicable)
  - 11. All other appropriate data

**1.06 DELIVERY, STORAGE AND HANDLING**

- a. Insulation material shall be delivered to project site in original, unbroken factory packaging labeled with product designation and thickness. Shipment of materials from manufacturer to installation location shall be in weather-tight transportation. Protect insulation materials from

moisture and weather during storage and installation. Protect insulation material against long exposure to UV light from sun.

## **PART 2 - PRODUCTS**

### **2.01 MANUFACTURERS**

- a. Insulation:
  - 1. Owens Corning, Johns Manville, Manson, Knauf or CertainTeed similar to product indicated except where product of manufacturers not listed above is specifically identified for special type of insulation.
- b. Coatings, Mastics, Sealants and Adhesives:
  - 1. Foster, Childers, Vimasco, Miracle or Pittsburgh Corning

### **2.02 MATERIALS**

- a. Products used for or related to air conditioning and ventilating systems shall conform to NFPA 90A possessing flame spread index of not over 25 and smoke developed index no higher than 50.
- b. Unless otherwise indicated, all products, material itself or on composite basis, shall have flame spread index not more than 25 and smoke developed index not more than 50, when tested in accordance with ASTM E-84 or UL723.
- c. Pipe insulation which is not located in air plenum may have flame spread rating not over 25 and smoke developed rating no higher than 450 when tested in accordance with UL 723 and ASTM E84.
- d. Outdoor insulation may have flame spread rating not over 75 and smoke developed rating not higher than 450.
- e. Insulation applied on stainless steel shall meet requirements of ASTM C795 and NRC 1.36.

### **2.03 INSULATION**

- a. Insulation materials shall be fire retardant, moisture and mildew resistant, vermin proof, and suitable to receive jackets, adhesives and coatings as indicated.
- b. Glass fiber insulation shall be of inert inorganic material, non-corrosive to mechanical surfaces.
- c. Insulating cement shall be Quick-Cote by PK Insulation MFG Co. or Ryder GP, with dry density of no more than 38 lb/ft<sup>3</sup> thermal conductivity of 0.96 at 400°F mean temperature, and service temperature to 1200°F.
- d. Filling and finishing cement shall be Super-Stik by PK Insulation MFG Co., or Ryder MW, with dry density of no more than 24 lb/ft<sup>3</sup>, thermal conductivity of 0.74 at 500°F mean temperature, and service temperature to 1900°F.
- e. Type A Insulation (Closed Cell Elastomeric Thermal Insulation):
  - 1. Minimum nominal density of 6 lb/ft<sup>3</sup>, thermal conductivity not more than 0.25 at 75°F mean temperature, maximum water vapor transmission of 0.06 perm-inch and suitable for temperatures from -70 to 220°F, Armacell Model AP/Armaflex, K-Flex USA, or Aeroflex Model Aerocel.

- f. Type G Insulation (Cellular Glass):
  - 1. 100% cellular glass cells with no organic material, noncombustible, 0.00 perm-inch permeability, 7.5 lb/ft<sup>3</sup> average density, compression strength 90 psi, thermal conductivity of not more than 0.31 at 50°F mean temperature and service temperature of 900°F. Pittsburgh Corning Foamglas or approved equal.
- g. Type P Insulation (Expanded Polyisocyanurate):
  - 1. Continuously molded rigid polyisocyanurate foam insulation meeting requirements of ASTM C-591, with thermal conductivity of not more than 0.19 at 75°F mean temperature, minimum nominal density of 2 lb/ft<sup>3</sup>, minimum compressive strength of 24 psi, maximum water vapor transmission of 4.0 perm-inch, maximum water absorption of 2% by volume, and suitable for temperature of plus 300°F down to -297°F. Insulation shall have factory-applied jacket with SSL. Trymer 2000 XP by ITW, Dyplast ISO-C1, or approved equal.
- h. Type R Insulation (Rigid Glass Fiber):
  - 1. Minimum nominal density of 3 lb/ft<sup>3</sup> with thermal conductivity of not more than 0.23 at 75°F mean temperature.
  - 2. Pipe insulation shall be premolded type in accordance with ASTM C547 Type I, suitable for temperatures to 850°F, Johns Manville Micro-Lok, Owens Corning Fiberglas ASJ/SSL-II or Knauf Earthwool 1000° pipe insulation.
  - 3. Duct and equipment insulation shall be in accordance with ASTM C612, Type IA and IB, suitable for temperatures to 450°F, Johns Manville Spin-Glas Type 814, Owens Corning Type 703, Knauf Insulation Board.
  - 4. Pipe and tank wrap faced with specified jacket may be used for equipment and round ducts insulation, provided that it meets all insulation characteristics requirements stated above and maintains same R-value as specified.

## 2.04 JACKETS

- a. Jacket puncture resistances shall be based on ASTM D-781 test methods. Vapor barrier permeance ratings shall be based on ASTM E-96 Procedure A.
- b. Type A-1 Jacket (Aluminum Roll Jacketing):
  - 1. Factory fabricated 0.016" thick, ASTM B209, Type 3003 or 3105, stucco embossed aluminum jacket with integrally bonded moisture barrier/retarder consisting of 3 layers of polymer films with total thickness of 3 mil.
  - 2. Fitting covers shall be factory fabricated from not lighter than 0.024" thick, Type 3003 or 1100 aluminum. For large pipes, where factory fabricated fitting covers are not available, Contractor shall fabricate fitting covers from like sheet materials.
  - 3. Jacketing system shall be similar to ITW Pabco/Childers or Insul-Mate by RPR Products, Inc.
- c. Type A-2 Jacket (Aluminum Roll Jacketing – High Temperature Application)
  - 1. Factory fabricated 0.016" thick, ASTM B209, Type 3003 or 3105, stucco embossed aluminum jacket. Due to potential for high temperature exposure, jacket shall be absent of additional moisture barrier/retarder of any kind.
  - 2. Fitting covers shall be factory fabricated from not lighter than 0.024" thick, Type 3003 or 1100 aluminum. For large pipes, where factory fabricated fitting covers are not available, Contractor shall fabricate fitting covers from like sheet materials.
- d. Type D-1 Jacket:
  - 1. Heavy-duty, fire retardant material with glass fiber reinforcing. Jackets shall have neat, white Kraft finish suitable for painting, with beach puncture resistance of 50 units

minimum. Vapor barrier shall be adhered to inner surface of jacket. Permeance shall not exceed 0.02 perm. Owens Corning "ASJ", Johns Manville "AP", Knauf "ASJ".

- e. Type D-2 Jacket:
  - 1. Glass fiber reinforced foil Kraft laminate with permeance not exceeding 0.02 perm and beach puncture resistance 25 units minimum. Owens Corning "FRK", Johns Manville "FSK", Knauf "FSK".
- f. Type D-3 Jacket:
  - 1. Self-adhering, multiple laminated waterproofing material with reflective aluminum foil, high density polymer films and minimum 40 mil rubberized asphalt waterproofing compound, similar to Peel and Seal or Flex Clad 400 by MFM Building Products Corp. or Alumaguard 60 by Polyguard or Alumaguard LT all weather.
  - 2. Venture Clad 1577 CW, Alumaguard Lite or Foster Vaporfas 62-05
    - a. Jackets shall be minimum 5 ply laminated, weather proofing material with acrylic adhesive capable of installation with no additional mechanical attachments, 0.00 water vapor permeance rating per ASTM E-96, mold inhibitors incorporated and UV stable.
    - b. Jackets shall have **[white][embossed aluminum][embossed white][tedlar]** finish.
- g. Type E-2 Jacket:
  - 1. Heat sealable, multi-ply laminate consisting of layer of asphalt, glass fiber reinforcement, second layer of asphalt, aluminum foil layer, third layer of asphalt, and polyester outer film. Pittsburgh Corning Pittwrap. Minimum total thickness shall be 125 mils.
  - 2. Self-sealing, non-metallic sheet consisting of special bituminous resin reinforced with woven glass fabric and 1 mil thick aluminum film. Pittsburgh Corning Pittwrap SS. Minimum total thickness shall be 70 mils.
- h. Type E-3, Jacket
  - 1. Self-sealing, modified bituminous membrane reinforced with glass fabric and 1 mil thick aluminum film. Pittsburgh Corning Pittwrap CW Plus. Minimum total thickness shall be 50 mils.
- i. Type P-1 Jackets:
  - 1. Heavy-duty, fire retardant material with glass fiber reinforcing and self-sealing lap. Jacket shall have neat, white Kraft finish suitable for painting, with burst strength of 1.5 Joules(50 beach units) minimum and tensile strength 45 lbs/in minimum. Vapor barrier shall be adhered to inner surface of jacket. Permeance shall not exceed 0.02 perm. Owens Corning "ASJ-SSL", Johns Manville "ASJ" and Knauf ASJ+.
- j. Type P-2 Jackets:
  - 1. Jackets shall be minimum 5 ply laminated, weather proofing material with acrylic adhesive capable of installation with no additional mechanical attachments, 0.00 water vapor permeance rating per ASTM E-96, mold inhibitors incorporated and UV stable, Venture Clad 1577 CW or Alumaguard Lite.
  - 2. Jackets shall have **[aluminum][white][embossed aluminum][embossed white][tedlar]** finish.
- k. Type SS-1 Jacket (Protective Insulation Shield):
  - 1. Factory fabricated 0.01" thick, ASTM A-240, Type 304 stainless steel, 2B mill finish jacket with integrally bonded moisture barrier/retarder consisting of 3 layers of polymer films with total thickness of 3 mil.

2. Fitting covers shall be factory fabricated from not lighter than 0.016" thick, Type 304 or Type 316 stainless steel. For large pipes, where factory fabricated fitting covers are not available, Contractor shall fabricate fitting covers from like sheet materials.
  3. Jacketing system shall be equal to ITW Pabco/Childers or InsulMate by RPR Products, Inc.
- I. Type SS-2 Jacket (Stainless Steel Roll Jacketing – High Temperature Application)
    1. Factory fabricated 0.01" thick, ASTM A-240, Type 304 stainless steel, 2B mill finish jacket. Due to potential for high temperature exposure, jacket shall be absent of additional moisture barrier/retarder of any kind.
    2. Fitting covers shall be factory fabricated from not lighter than 0.016" thick, Type 304 or Type 316 stainless steel. For large pipe where factory fabricated fitting covers are not available, Contractor shall fabricate fitting covers from like sheet materials.
    3. Jacketing system shall be similar to ITW Pabco/Childers or Insul-Mate by RPR Products, Inc.
- m. Type S-1 Jacket:
    1. Saran Vapor Retarder Film with self-sealing lap (SSL), ASTM C-755 and C-1136, 6 mil thickness. Permeance shall not exceed 0.01 perms, equal to Dow Saran 540 CX.
    2. Elbows, fittings, valves and butt joints shall be wrapped with 3 layers of Dow Saran 520 Vapor Retarder tape.
    3. Provide PVC jacket (Type V-1) over Saran tapes for exposed elbows, fittings and valves.
- n. Type V-1 Jacket:
    1. Fire retardant and UV resistant PVC in minimum [20 mil (0.02")][30 mil (0.03")] thickness consisting of preformed fitting covers, preformed end terminations, and sheet material for straight runs of pipe. Jacketing system shall be suitable for indoor and outdoor application in temperature range of -35°F to 150°F. Material when installed according to manufacturer's instructions shall provide complete vapor barrier and readily cleanable surface while meeting Federal CGMP requirements.
    2. Jacketing system shall be equal to Johns Manville Zeston/Perma-Weld System or Speedline Smoke Safe. Similar product by PROTO will be acceptable.

## **2.05 ADHESIVES, MASTIC, COATINGS, SEALANTS, AND REINFORCING MATERIALS**

- a. Adhesives and sealants shall comply with the South Coast Air Quality Management District (SCAQMD) Rule #1168; VOC limits shall comply with Indoor Environmental Quality Section, Credit IEQ-4.1.
- b. Coatings and mastics shall comply with VOC limits set forth by Green Seal BS-11 and comply with the South Coast Air Quality Management District (SCAQMD) Rule #113; VOC limits shall comply with Indoor Environmental Quality Section, Credit IEQ-4.2.
- c. Products shall be compatible with surfaces and materials on which they are applied, and shall be suitable for use at operating temperatures of systems to which they are applied.
- d. Products shall be fire retardant, moisture resistant and mildew resistant and vermin proof.
- e. Vapor Barrier Mastic: Below ambient insulation. Water vapor permeance shall be less than 0.08 perms at 45 mils dry film thickness per ASTM F1249.
  1. Foster 30-33
  2. Childers CP-33
  3. Vimasco 749

- f. Weather Barrier Breather Mastic: Above ambient insulation. Permeance shall be greater than 1.0 perms at 1/16" dry film thickness per ASTM E96.
  - 1. Foster 46-50 Weatherite
  - 2. Childers CP-10/CP-11 Vi Cryl
  - 3. Vimasco WC-5
- g. Lagging Adhesive/Coatings: Indoors applications used in conjunction with canvas/glass cloth.
  - 1. Foster 30-36
  - 2. Childers CP-50 AMV1
  - 3. Vimasco 713
- h. Metal jacketing sealant for aluminum jacketing:
  - 1. Foster 95-44 Elastolar
  - 2. Childers CP-76 Chil Byl
  - 3. Pittsburgh Corning 727
- i. Insulation joint sealant for Type P, Type PP, and Type G insulation:
  - 1. Foster 95-50 Flextra
  - 2. Childers CP-76 Chil Byl
  - 3. Pittsburgh Corning CW Sealant
- j. Glass fiber fabric reinforcing shall be 10 x 10 mesh similar to Childers Chil Glas #10 or Foster Mast A Fab.
- k. Wire mesh reinforcing shall be 22 ga, 1" galvanized.
- l. Insulation cement shall be ANSI/ASTM C195, hydraulic setting mineral wool.
- m. Finishing cement shall be ASTM C449.
- n. Butt joint and longitudinal joint adhesive for Type A insulation shall be Armstrong 520, Rubatex 373, Childers CP-82 or Foster 85-75.
- o. Weather-resistant protective finish for Type A insulation shall be equal to Armstrong WB Armaflex finish or Foster 30-64 elastomeric coating.

## **2.06 METAL BANDS AND WIRES**

- a. Aluminum bands shall be 0.5" x 0.020" up to 48" diameter and 0.75" x 0.020" over 48" diameter.
- b. Stainless steel bands shall be 0.5" x 0.015" or 0.75" x 0.015".
- c. Stainless steel wires shall be 16 ga.

## **2.07 INSULATION FASTENERS**

- a. Insulation fasteners shall be cup head weld pins, galvanized low carbon steel, minimum 12 ga (0.105") pins.
- b. Washer edge shall be beveled.
- c. Fasteners shall be stainless steel for stainless steel ductwork application.
- d. Insulation fasteners using adhesive are not allowed.

**2.08 REMOVABLE INSULATING BLANKETS**

- a. Custom designed removable, reusable, flexible, blanket thermal insulation system.
- b. Acceptable Manufacturers: Thermal Energy Products, Inc., Advanced Thermal Corp., Temptec and Remco Technology, Inc.
- c. Removable insulation system shall be custom designed for each individual item to provide close contour fit. Overlapping seams and gaps are not acceptable.
- d. Removable insulation shall be designed to overlap adjoining pipe insulation by 2".
- e. Insulation: Minimum 2" thick, 2.4 lb/ft<sup>3</sup> density, 1000°F continuous service temperature thermal insulating wool; Owens Corning Fiberglass or equal.
- f. Interior and Exterior Fabric: Minimum weight 17.5 oz/sq yd silicone rubber coated fiberglass cloth.
- g. Securement: Blanket seams shall be closed with buckle and strap assembly (D ring closure).
- h. Identification/Tagging: Label each removable insulation device with plastic or 304 stainless steel tag with raised letters. Tag as directed by Owner.

**PART 3 - EXECUTION**

**3.01 APPLICATION**

- a. Provide insulation and jackets as indicated in the following schedule. The schedule applies to both exposed and concealed applications unless noted otherwise:

<u>Service</u>	<u>Jacket Type</u>	<u>Insulation Type</u>	<u>Piping System</u>				
			<u>3/4" and less</u>	<u>Insulation Thickness According to Pipe Size</u>			
				<u>1" - 1-1/4"</u>	<u>1-1/2" - 3"</u>	<u>4" - 6"</u>	<u>8" and Larger</u>
Condenser Water (Interior) (50°F and lower or used for water side economizer)	S-1	P	1"	1"	1"	1"	1-1/2"
Domestic, Potable Cold Water	P-1	R	1"	1"	1"	1"	1"
	--	A	3/4"	3/4"	3/4"	3/4"	3/4"
(Type A Insulation is an option)							
Piping Provided with Heat Tracing	P-1	R	1"	1-1/2"	2"	2"	2"
Insulation thickness shall be the greater thickness specified for piping system or thickness specified above.							

Insulated Exterior Piping  
 Insulated Piping Subject to Abuse as Indicated on Drawings

Unless otherwise indicated, provide protective insulation shield (Type A-1 jacket) in addition to pipe insulation and jacket specified in this schedule.  
 Provide Type H insulation for hot piping and Type P insulation for cold piping with V-1 jacket in lieu of specified insulation/jacket with same insulation thickness.



**3.02 INSTALLATION - GENERAL**

- a. All insulation installation methods shall be performed in accordance with the latest edition of National Commercial and Industrial Insulation Standards published by MICA (Midwest Insulation Contractors Association) and manufacturer's installation instructions, except as modified in this Section of specifications.
- b. Install products with good workmanship, with smooth and even surfaces. Use full-length factory-furnished material where possible. Do not use scrap pieces.
- c. Apply insulation only on clean, dry surfaces, after all rust and scale have been removed and testing of systems has been completed. Do not insulate any section of system that must be pressure tested until after it has been successfully tested. Any removal and reinstallation to correct system defects prior to end of guarantee period shall be accomplished at no expense to Owner.
- d. Install insulating materials with necessary joints and terminations, to permit easy access and removal of equipment sections where inspection, service or repair is required, and to allow for expansion.
- e. Where possible longitudinal joints in jackets shall face toward wall or ceiling.
- f. Apply insulation to each pipe or duct individually. Common insulation applied to adjacent pipes or ducts will not be accepted.
- g. Unless otherwise indicated, pipe and duct insulation shall be continuous through walls and floors.
- h. Where multiple layers of insulation are used, stagger and secure each layer with metal bands.
- i. Where penetrations occur through fire-rated walls, partitions, or floors, provide fire seal as specified in Section 20 0000 - General Mechanical Requirements and Section 20 0573 - Mechanical Systems Firestopping.
- j. Insulate water piping within casework up to penetration of casework pipe chase at fixture stop. Insulate water piping within walls up to pipe penetration through the wall at fixture stop when serving wall-mounted fixtures. Termination of insulation shall be in neat and workman like manner with insulation jacket cap.
- k. Insulate the following systems for complete vapor barrier protection:
  1. Cooling coil condensate drain
  2. Cold Water
- l. Apply Type A insulation for insulation and jackets requiring vapor barrier protection where specified insulations are cut for mounting sensors, control devices, parts of valves, devices or components which extend out from specified insulation to prevent condensation.

**3.03 GLASS FIBER FABRIC COVERING (TYPE E-1 JACKET)**

- a. Glass fiber fabric shall be fitted without wrinkles.
- b. Glass fiber fabric shall be sized immediately upon application with lagging adhesive and shall be capable of drying within 6 h.
- c. Apply adhesive and coating in accordance with manufacturer's recommendations.

- d. All seams shall overlap not less than 2".

### **3.04 PIPING, VALVE AND FITTING INSULATION**

- a. Apply insulation to pipe, unions, flanges, fittings, valves and piping specialties with butt joints and longitudinal seams closed tightly. Valve insulation shall cover entire valve body including bonnets and packing nuts.
- b. Laps on factory-applied jackets shall be 2" minimum width firmly cemented with lap adhesive, or shall be pressure sealing type lap.
- c. Cover joints with factory furnished tape (3" minimum width) to match jacket. Cement firmly with lap adhesive. On systems requiring a vapor barrier (ASJ), vaporseal all longitudinal and butt joints ASJ/Saran seams with 4" wide coat of vapor barrier mastic or 3" minimum tape.
- d. Where staples are used, they shall be on 6" maximum centers. When used for systems requiring vapor barrier, cover lap and staples with finish coat of vapor barrier mastic or 3" minimum tape.
- e. For finishing of insulated pipe fittings and valves where surface temperature of insulation is not higher than 125°F, use one piece PVC fitting covers, minimum thickness of 20 mil, Fitting cover shall be Johns Manville Zeston 2000 PVC, PROTO Fitting Covers, or similar by other manufacturers listed. Where fitting and valve insulation requires vapor barrier, seal joints of PVC covers with vapor barrier adhesives. Insulation type, R-value and density of insulation used at fittings shall match insulation of adjacent piping. Install insulation at pipe fittings and valves completely prior to applying PVC covers.
  - 1. For Type R (Rigid glass fiber) pipe insulation, PVC fitting covers with flexible mineral fiber blanket insulation inserts are acceptable, except those located in mechanical rooms within 6 ft above floor. For fitting covers located in mechanical room within 6 ft. above floor, insulation inserts shall be pre-molded rigid fiber glass type wrapped around elbows.
- f. Stove pipe style insulation on elbows (Detail A on Plate 2-200 of MICA 8<sup>th</sup> Edition) is not allowed. It may be used for closed cell elastomeric insulation.
- g. Where terminations of pipe insulation are required, insulation shall have tapered ends, built up and finished as specified for fittings.
- h. For pipes 1-1/2" and smaller, install specified pipe insulation and jacket continuous through hanger or support locations. Install insulation protection shields to protect insulation from compressing.
- i. For pipes 2" and larger, where manufactured pre-insulated pipe supports are used at hanger or support locations, extend insulation to insulated pipe supports. Where vapor barrier is required, this Contractor shall be responsible for continuity of vapor barrier at insulated pipe supports. Use 3" wide vapor barrier tape on hot and cold systems at pipe supports.
- j. For pre-insulated pipe supports and insulation protection shields, refer to Section 20 0529 - Piping and Equipment Supporting Devices.
- k. For Contractor-fabricated anchors, secure insulation directly to pipe surface and extend insulation up anchor for distance of 4 times insulation thickness. For pre-insulated anchors, cover entire surface of anchors with Type A insulation. Where applicable, take special care to assure vapor seal at anchor.
- l. Where mechanical grooved pipe connections are used in piping system, insulate couplings as specified for pipe.

- m. Piping, fittings and valves not to be insulated:
  - 1. Heating hot water piping inside fin tube radiation enclosures
  - 2. Control valves and balancing valves for heating terminal devices
  - 3. Valves furnished with removable insulation/jacket
  - 4. Steam system traps

### **3.05 PROTECTIVE INSULATION SHIELD (A-1 JACKET) FOR PIPE JACKETS EXTERIOR TO BUILDING**

- a. Unless otherwise indicated, install shields (A-1 jacket) around insulated pipe and fittings exterior to building. Seal water and vapor tight at terminations.
- b. Longitudinal overlap shall be at least 2" wide with vapor barrier sealant.
- c. Secure jacketing with 3/4" wide 0.015" stainless steel or 3/4" wide 0.020" aluminum bands and wing seals on maximum 18" centers.

### **3.06 TYPE G INSULATION (CELLULAR GLASS)**

- a. Install cellular glass insulation system in strict accordance with manufacturer's installation instructions.

### **3.07 TYPE P INSULATION (POLYISOCYANURATE)**

- a. Install Type P insulation with specified insulation jacket in accordance with manufacturer's installation recommendations. Insulation shall be tightly butted and free of voids and gaps at joints. Use 3" wide tape at butt joints with minimum 1.25 times circumference wrapping. Apply insulation joint sealant in longitudinal and butt joints.
- b. Install pre-fabricated tight fitting insulation pieces on fittings, elbows, tees and valves.
- c. Insulation at fittings and valves shall be the same thickness as on pipe section.
- d. Replace Type P insulation and jacket with Type R insulation of same thickness with Type P-1 jacket at penetration of fire rated walls and floor slabs where fire stopping system is required.

### **3.08 TYPE S INSULATION (POLYSTYRENE)**

- a. Pipe:
  - 1. Use sectional insulation (semi-circular form) for pipe sizes 10" and smaller. Use segmental or sectional insulation for pipe sizes above 10".
  - 2. Plain sectional insulation shall be applied so that end joints are broken by making one-half of first section 18" long and leaving other half 36" in length. Longitudinal joints shall be on top and bottom of pipe. Apply insulation with sealer such as Foster 30-45 Foam-seal or Childers CP-70 Chil Joint on joints of single layer and outer layer insulation with band placed approximately 3" or 4-1/2" (see band schedule) back from end joints. Do not cement insulation to pipe. Omit joint sealer from inner layer of double layer insulation.
  - 3. Plain insulation lagging (blocks) for segmental insulation may be factory fabricated or beveled lagging assembled on job. Lags shall fit pipe snugly and maximum width of each lag shall be such as to leave not more than 1/8" void between pipe and joints of segments. Joints shall be broken by, starting with alternating 18" and 36" lags. Apply sealer and bands same as specified for plain sectional insulation.
  - 4. Apply pipe insulation in double layer construction with joints staggered (2 layers at 1" thick each).

- b. Fittings, Valves and Flanges:
  - 1. Insulation at fittings shall not be of less thickness than insulation on adjacent piping. Fitting insulation (covers) shall be held together and applied with sealer. Insulation on welded fittings shall fit snugly to fitting contour and shall be applied in same manner and with same materials as specified for pipe.
  - 2. Apply fitting insulation with sealer on joints and band insulation in place using not fewer than 2 bands on threaded fittings and 4 bands on flanged fitting.
  - 3. Insulate threaded fittings before straight pipe is covered. Insulate flanged fittings after straight pipe is covered.
- c. Band Material:
  - 1. Secure single layer or outer layer insulation with stainless steel bands, 6" spacing for insulated outside diameter under 12" and 9" spacing for 12" and over.
  - 2. Secure inner layer insulation with stainless steel bands 9" spacing.
  - 3. Tighten bands with mechanical tightening tool and secure with 304 stainless steel wing type seals.
- d. Vapor Barrier and Jacket:
  - 1. Finish plain pipe insulation, fittings, valves and flanges with vapor barrier mastic.
  - 2. After thoroughly dry, apply service jacket (Type P-1) and insulation shield jacket (Type A-1).

**END OF SECTION**

**SECTION 23 0594A**

**WATER SYSTEMS TEST ADJUST BALANCE**

**PART 1 - GENERAL**

**1.01 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.02 DESCRIPTION**

- a. This Contractor shall be responsible for providing complete testing, adjusting and balancing (TAB) work of all HVAC hydronic systems including distribution systems and the equipment and apparatus connected.
- b. Work required shall consist of setting volume (flow) and speed adjusting facilities provided or specified for systems, recording data, making tests and preparing reports, as hereinafter specified.
- c. TAB work, shall be performed by separate, independent contractor who is certified by either National Environmental Balancing Bureau (NEBB), Associated Air Balance Council (AABC) or Testing, Adjusting and Balancing Bureau (TABB).
- d. TAB work, may be performed by Mechanical Contractor with prior written approval by Architect/Engineer.
- e. Upon direction of Architect/Engineer or TAB Contractor, Mechanical Contractor shall provide at no additional cost to Owner, any additional work and/or devices necessary to properly balance system, including calibrated balancing valves, gauge tapings, flow sensors, and thermometer wells. Mechanical Contractor shall also be responsible for trimming and balancing pump impellers as necessary to obtain design pump flow rates, or maximum pump efficiency.

**1.03 PROCEDURES**

- a. Unless otherwise specified, test, adjust and balance water systems including all equipment, apparatus and distribution systems in accordance with the latest edition of NEBB, AABC or TABB Procedural Standards for Testing, Adjusting and Balancing of Environmental Systems.

**1.04 INSTRUMENTS**

- a. Instruments used for measurements shall be accurate, and calibration histories for each instrument shall be available for examination. Calibration and maintenance of instruments shall be in accordance with requirements of NEBB, AABC or TABB.
- b. Application of instruments and accuracy of measurements shall be in accordance with NEBB, AABC, or TABB Standards.

**1.05 REPORTS**

- a. Submit 5 certified copies of Final Reports on applicable NEBB, AABC or TABB Reporting Forms for approval. Provide sortable electronic version as well as hard copy.

- b. Each individual Final Report Form submitted, shall bear name of person who recorded data and seal of supervisor of TAB Contractor.
- c. Include identification of all types of instruments used and their latest dates of calibration with Final Reports.
- d. Note any and all discrepancies in design flows on report forms.
- e. Incomplete report forms will not be approved.

**1.06 GUARANTEE**

- a. Guarantee that test, adjust and balance work be performed in accordance with standards and that water systems operate within plus or minus 10% of design flow rates as shown on plans and/or as scheduled.

**PART 2 - PRODUCTS**

**2.01 (NOT APPLICABLE TO THIS SECTION)**

**PART 3 - EXECUTION**

**3.01 GENERAL**

- a. Test, adjust and balance water systems and associated components in accordance with procedures outlined in Standards.
- b. Upon completion of TAB work, mark equipment settings, including valve indicators, and similar devices to indicate final settings in approved manner.

**END OF SECTION**

**SECTION 23 2116**

**PIPE AND PIPE FITTINGS**

**PART 1 - GENERAL**

**1.01 RELATED WORK**

- a. Section 23 0594 - Water Systems Test Adjust Balance

**1.02 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.03 DESCRIPTION**

- a. Specification of an item in this or any other sections shall not relieve Contractor from providing all items, articles, materials, operations, methods, labor, equipment and incidentals necessary for a complete and functional system.
- b. Use only new material, free of defects, rust and scale, and guarantee for services intended.
- c. Use material meeting the latest revision of ASTM specifications as listed in this specification.
- d. Follow local codes if they require other types of pipe or joints.
- e. Use only long radius elbows having centerline radius of 1.5 pipe diameters unless otherwise indicated.
- f. Manufacturer, pressure class, size and heat code of each fitting and flange shall be permanently identified on its body in accordance with MSS SP-25.
- g. Where size for a pipe segment is not indicated, the pipe segment size shall be equal to the largest pipe segment to which it is connected. Transition to smaller size shall occur on the side of fitting where smaller size is indicated.
- h. Unless otherwise indicated, fittings and accessories connected to pipe shall be of the same material as the pipe.
- i. Unless otherwise indicated, construct piping for highest pressures and temperatures in respective system in accordance with the latest revision of the applicable Sections of ASME Code for pressure piping, ASME B31 including the following:
  - 1. B31.9 Building Services Piping
- j. Non-metallic piping is acceptable only for services indicated. It is not acceptable in occupied spaces and ventilation plenum spaces.

**1.04 SUBMITTALS**

- a. Shop Drawings for each piping system for all pipe sizes including, but not limited to, the following:
  - 1. Name of system
  - 2. Pipe; ASTM number, grade if known, type, wall thickness, material
  - 3. Fittings; ASME number, grade if known, class, type, wall thickness, material

4. Joint type
  5. Flanges; ASTM number, grade, class, type, material
  6. Bolts and nuts; material
  7. Thread joint sealants; material
  8. Flange gaskets; material, rating
  9. Unions; ASTM number, type, material, rating
  10. Type of welding
  11. Welding Quality Control Program
  12. Test pressure and media
  13. Pipe flushing/cleaning plan
  14. Pipe cleaning method
  15. All other appropriate data
- b. Submit pipe certification as specified under Pipe Certification in this Section.
- c. Submit required documents as specified under Pipe Welding in this Section.
- d. Provide Flushing and Cleaning Plan:
1. Submit pipe flushing/cleaning plan for water, fluid, steam and condensate systems for approval. Plan shall detail methods for compliance with requirements of this section, including:
    - a. Flushing and cleaning procedure narratives.
    - b. Size, power source, and connection points of contractor provided pumps that will be used for flushing and cleaning.
    - c. If Contractor proposes to utilize project system pumps, method of protecting pumps from damage and developing required velocity of section of piping to be flushed.
    - d. Method of sectionalizing piping to obtain required velocity.
    - e. Minimum velocities at each section of pipe, clearly indicating any sections where 6 fps cannot be achieved.
    - f. Location and means of temporary bypasses for coils, control valves and other equipment.
  2. Submit documents showing verification of flushing/cleaning following specified requirements and results.

#### **1.05 PRODUCT DELIVERY, STORAGE AND HANDLING**

- a. Furnish pipe with plastic end-caps/plugs on each end of pipe. Maintain end-caps/plugs through shipping, storage and handling to prevent pipe-end damage and eliminate dirt and construction debris from accumulating inside of pipe.
- b. Where possible, store materials inside and protect from weather. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.
- c. Before shipping, all carbon steel piping shall be free of rust and scale, and furnished with plastic end caps/plugs on each end of pipe.

#### **1.06 PIPE WELDING**

- a. Procedure and Welding Qualification Records:
  1. Submit Welding Procedure Specifications (WPSs) and their supporting Procedure Qualification Records (PQRs) to be used on the work to Engineer for review and approval



prior to performing any welding. These documents shall meet requirements of ASME B31.1 and B31.9, as applicable.

2. Unless otherwise indicated, welding shall be done using only the following processes:
    - a. Shielded Metal Arc Welding (SMAW), also known as "stick" welding
    - b. Gas Tungsten Arc Welding (GTAW), also known as TIG and Heliarc welding
    - c. Gas Metal Arc Welding (GMAW), also known as MIG welding
    - d. Flux-Cored Arc Welding (FCAW), a variation of GMAW
    - e. Submerged Arc Welding (SAW)
  3. Unless otherwise stated, fabrication, installation, inspection, examination and testing shall be in accordance with ASME B31.1 or B31.9, as applicable.
  4. Backing rings (chill rings) or consumable inserts are not allowed, unless specifically requested by Owner or Engineer.
- b. Welder Qualifications:
1. Each welder and welding operator must qualify by passing required procedure test before performing any project welds. Submit copy of Manufacturer's Record of Welder or Welding Operator Qualification Tests (WPQS) as required by Section IX of ASME Boiler and Pressure Vessel Code for all welding procedures to be performed by welding operator.
  2. Welder qualifications must be current. If qualification test is more than 6 months old, provide record of welding continuity for each welder.
  3. Record of welding continuity is intended to show that welder has performed welding at least every 6 months since the date that welder qualification test was passed for the submitted welding procedure specification.
  4. Record of welding continuity shall include, at minimum, the following:
    - a. Welder's employer name and address
    - b. Date Welder Qualification Test was passed
    - c. Dates indicating welding continuity

#### **1.07 FLANGES**

- a. Use either flat faced or raised-face flanges for mating with flat-faced or raised-face flanges.
- b. Welding Neck Flanges:
  1. All flanges shall be welding neck type unless otherwise indicated.
- c. Slip-on Flanges:
  1. Slip-on flanges shall not be used without specific approval of Engineer. Contractor shall submit written request for use of slip-on flange for specific instance where use of welding neck flange is problematic. Slip-on flanges over 4" pipe size are prohibited for any application under ASME B31.1.
- d. Bore dimension of flange shall match inside diameter of connecting pipe.
- e. Bolts and Nuts:
  1. Threads shall be in accordance with ANSI/ASME B1.1, Class 2A tolerance for external threads and Class 2B tolerance for internal threads. Threads shall be coarse-thread series except that alloy steel bolting 1-1/8" and larger in diameter shall be 8 pitch thread series.
  2. Threaded rods are not allowed in lieu of bolts.

**1.08 CATHODIC PROTECTION**

- a. Cathodic protection shall be designed and provided by system pre-insulated pipe manufacturer for pipe systems as specified in Part 2. Cathodic protection shall conform to recognized practices and shall be designed by qualified personnel. Measurements of corrosivity of soil environment expressed in terms of soil's electrical resistivity (ohm/cm) shall be taken and checked out by pre-insulated pipe manufacturer. Resistivities shall be given along proposed routing of piping systems. Anodes and test stations shall be provided by this Contractor as recommended by pre-insulated pipe manufacturer.
- b. After installation, field survey shall be made by pre-fabricated pipe manufacturer and measurement of current and conduit-to-soil potentials at each test station shall be taken.

**PART 2 - PRODUCTS**

**2.01 CONDENSER WATER(THROUGH 250 PSIG/200°F)**

- a. 2" and Smaller:
  - 1. Pipe: ASTM A53, Grade B, Type E or S or ASTM A106, Grade B, standard weight, carbon steel
  - 2. Fittings: ASME B16.3, Class 150, malleable iron, threaded
  - 3. Unions: ASME B16.39, black malleable iron ground joint, bronze or brass to iron, Class 250
- b. 2-1/2" through 24":
  - 1. Pipe: ASTM A53, Grade B, Type E or S or ASTM A106, Grade B, standard weight, carbon steel
  - 2. Fittings: ASTM A234 Grade WPB/ASME B16.9, standard weight, seamless, carbon steel weld
  - 3. Flanges:
    - a. ANSI Class **[150][300]**, ASTM A105, ASME B16.5, welding neck
  - 4. Bolts and Nuts:
    - a. ASTM A193, Grade B7 or B16 with nuts conforming to ASTM A194, Grade 2H.
  - 5. Gaskets
    - a. ASME B16.21 and ASTM F104 flat ring type, asbestos-free, compressed inorganic fiber with nitrile binder.
    - b. 2-1/2" thru 12"
      - 1). Gasket thickness 1/16"
      - 2). Maximum Seating Stress (*y*) 3050 psi
      - 3). Minimum Gasket Factor (*m*) 4.2
    - c. 14" and larger:
      - 1). Gasket thickness 1/8"
      - 2). Maximum Seating Stress (*y*) 4400 psi
      - 3). Minimum Gasket Factor (*m*) 5.2
    - d. Garlock, Klingsil or J.M. Clipper, similar to Garlock 3000.

**2.02 CHEMICAL TREATMENT**

- a. Condenser Water System:

1. Chlorinated polyvinyl chloride (CPVC) shall conform to material 23447 or 23567-A of ASTM D1784, pipe shall be manufactured in accordance with ASTM D1785, Schedule 80, with ASTM F439 solvent cement socket fittings.

### **2.03 VENTS AND RELIEF VALVES**

- a. Unless otherwise indicated, use pipe and pipe fittings as indicated for the system to which relief valve or vent is connected.
- b. ASTM A53, Grade B, Type E or S, carbon steel pipe with standard weight, carbon steel fittings may be used for steam vents smaller than 4".
- c. Use ASTM A53, Grade B, Type E or S carbon steel pipe with ASTM A234 Grade WPB/ASME B16.9, standard weight, seamless carbon steel weld fittings for refrigerant vent piping.

### **2.04 PRESSURE GAUGES AND TAPPINGS**

- a. Use pipe and pipe fittings as indicated for the system to which pressure gauge or tapping is connected. Use "Threadolets", "Sokolets" or tee fittings for tappings. Refer to Part 3 under General for use of "Threadolets" and "Sokolets".
- b. Gauge pipe shall be 1/4" unless otherwise indicated.
- c. Gauge pipe shall be 1/2" for high pressure steam (101 psig and over) systems.

### **2.05 DIELECTRIC UNIONS, FLANGES AND FITTINGS (STEEL PIPE TO COPPER PIPE)**

- a. 2" and Smaller:
  1. Use bronze ball valves specified in Section 23 2118 for dielectric purpose.
  2. Dielectric fittings similar to Victaulic Style 647 or Clearflow Dielectric Waterway fittings may be used in lieu of dielectric unions for pipe sizes 2" and smaller.
    - a. Clearflow fittings shall be ASTM A53 electro zinc-plated steel pipe with high temperature polyolefin polymer liner, suitable for continuous use at temperatures up to 230°F and pressures up to 300 psig.
- b. 2-1/2" through 4":
  1. Watts dielectric flange fittings Series LF 3100/LF 3110 with dielectric gasket, 175 psi at 180°F.
  2. Dielectric fittings similar to Victaulic Style 647 or Clearflow Dielectric Waterway fittings may be used in lieu of dielectric unions for pipe sizes 2-1/2" and larger.
    - a. Clearflow fittings shall be ASTM A53 electro zinc-plated steel pipe with high temperature polyolefin polymer liner, suitable for continuous use at temperatures up to 230°F and pressures up to 300 psig.

### **2.06 DIELECTRIC UNIONS, FLANGES AND FITTINGS (STEEL TO STEEL PIPE)**

- a. 1" and Smaller: Similar to Epco model HA-B with dielectric gasket, 250 psi at 210°F
- b. 1-1/2" and Larger: Similar to Epco model W with bolt insulators, dielectric gasket, bolts and nuts, 175 psi at 210°F). Pikotek model VSC dielectric gasket with viton sealing element, G-10 sleeve and double washers, suitable to 350°F, may be used with specified flanges.

**2.07 THREADED JOINT SEALANTS**

- a. Paste type for brush application or cord type. Products shall be non-toxic, chemically inert, non-hardening, rated for -50°F to 400°F and up to 10,000 psi (liquids) and 2000 psi (gases), certified by UL, CSA, and NSF.
- b. Use sealant similar to Loctite Model 54531 for piping handling oil or petroleum products.

**2.08 WELD BRANCH OUTLET FITTINGS (WELDOLETS, THREDOLETS AND SOCKOLETS)**

- a. Weld branch outlet fittings shall conform to MSS-SP-97, ASME B16.9 for weldolets, ASME B1.20.1 for thredolets and ASME B16.11 for sockolets.
- b. Materials shall match material of header piping and wall thickness of outlet or branch end shall match wall thickness of branch pipe.

**PART 3 - EXECUTION****3.01 GENERAL**

- a. Remove foreign materials before erection. Ream ends of piping to remove burrs.
- b. Install piping parallel to building walls and ceilings and at such heights so as not to obstruct any portion of window, doorway, stairway, or passageway. Install piping to allow adequate service space for equipment. Refer to drawings and/or manufacturer's recommendations. Install vertical piping plumb. Where interferences develop in field, offset or reroute piping as required to clear such interferences. In all cases, consult drawings for exact location of pipe spaces, ceiling heights, door and window openings or other architectural details before installing piping.
- c. Provide anchors, expansion joints, swing joints and expansion loops so that piping may expand and contract without damage to itself, equipment or building.
- d. Mitered elbows, welded branch connections, notched tees and "orange peel" reducers are not allowed. Unless specifically indicated, reducing flanges and reducing bushings are not allowed. Reducing bushings may be used for air vents and instrumentation connections.
- e. Unless otherwise indicated, use fittings as specified in Part 2 of this Section for elbows, tees, reducers, etc.
- f. "Weldolets" with outlet size 2-1/2" and larger and "Thredolets" or "Sockolets" with outlet size 2" and smaller may be used for branch connections up to one pipe size smaller than main. Use "Thredolets" where threaded fittings are specified and use "Sockolets" where socket weld fittings are specified. Install in accordance with PFI (Pipe Fabrication Institute) Standard ES49.
- g. Install drains throughout systems to permit complete drainage of entire system.
- h. Do not install piping over electrical panelboards, switchgear, switchboards or motor control centers.
- i. Install valves, control valves and piping specialties, including items furnished by others, as specified and/or detailed.
- j. Make connections to equipment installed by others where that equipment requires piping services indicated in this Section.

**3.02 THREADED PIPE JOINTS**

- a. Threads of pipe and fittings shall conform to ASME B1.20.1.
- b. Ream pipe ends after cutting and clean before erection. Apply thread sealants to cleaned male threads. Assemble joint to appropriate depth and remove any excess pipe joint compound from tightened joint.

**3.03 FLANGED JOINTS**

- a. Clean flange surfaces and align them parallel. Bolt holes of gaskets shall be cut slightly larger than bolt diameter. Gasket ID shall be slightly larger than flange ID.
- b. Position gasket concentrically so compression is equally distributed over entire gasket surface.
- c. Lubricate bolts and run nuts down by hand.
- d. By using torque wrench, tighten nuts in the proper sequence so gasket is compressed evenly, and to the appropriate torque specified by bolt manufacturer.

**3.04 WELDED PIPE JOINTS**

- a. Inspect pipe and pipe fittings for roundness before they are fit-up or set in place.
- b. Properly clean and prepare pipe base material before fit-up. Verify joint land and bevel.
- c. Preheat pipe base material as required by welding procedure specification. Temperature of pipe material must be minimum of 50°F before welding.
- d. Properly align and adjust joint as required by welding procedure and thickness of material. Verify tolerances after tacking sequence.
- e. Use weld material diameter as procedurally required for type and thickness of work being done.
- f. Use sufficient argon pre-purge and argon post-purge for GTAW processes. Post purge should be until weld is no longer glowing plus 5 seconds. Maintain purge for at least 2 layers of weld material.
- g. Properly store welding materials.
- h. Clean tacks before welding out. Remove slag after each pass by grinding to avoid slag inclusion.
- i. Weld reinforcement shall not exceed limits established in Chapter V of ASME B31.1.
- j. Brush each weld free of rust and paint with rust resistant product that matches piping surface color.
- k. For piping within scope of ASME B31.1, each weld shall be permanently marked by welder performing weld. Each welder shall sign and date field welding log record for all welds performed by welder as indicated in Part 1.

**3.05 COPPER PIPE JOINTS**

- a. Cutting of tubing shall not make tubing out of round. Ream cut tube ends to full inside diameter.

- b. Remove slivers and burrs remaining from tube cut by reaming and filing both pipe surfaces. Clean fitting and tube with emery or sand cloth. Remove residue from cleaning operation, apply flux and assemble joint. Use solder or brazing to secure joint as specified for specific piping service.
- c. Press Joint Option:
  - 1. Cut pipe square and ream before assembly
  - 2. Insert pipe fully into fitting and mark on pipe at shoulder of fitting
  - 3. Check fitting alignment against mark on pipe to ensure pipe is fully engaged

### **3.06 WATER SYSTEMS**

- a. Unless otherwise indicated, install horizontal piping level. Install manual air vents at all high points where air may collect. If vent is not in accessible location, extend air vent piping to nearest code acceptable drain location with vent valve located at nearest accessible location to pipe.
- b. Main branches and runouts to terminal equipment may be made at top, top 45°, side or bottom 45° of main provided that there are drain valves suitably located for complete system drainage and manual air vents are located as described above.
- c. Unless otherwise indicated, use top or top 45° connection to main for upfeed risers, and use side or bottom 45° connection to main for downfeed risers. Bottom connection is not allowed.
- d. Use minimum of 3 elbows in each pipeline to terminal equipment to provide flexibility for expansion and contraction of piping systems. Offset pipe connections at equipment to allow for service, such as removal of terminal device.
- e. Unless otherwise indicated, use concentric fittings for changes in pipe sizes and for valves smaller than pipe sizes.
- f. Notch and dimple branch tubes. Braze joints. Apply heat properly so that pipe and tee do not distort. Remove distorted connections.

### **3.07 CHEMICAL TREATMENT**

- a. Install piping as indicated on drawings, as detailed, and as recommended by supplier of chemical treatment equipment.

### **3.08 DIELECTRIC UNIONS AND FITTINGS**

- a. Install dielectric unions, flanges or fittings in main and branch piping of water systems at each point where copper to steel pipe connection occurs. Dielectric unions or fittings shall not be used at terminal device connections.
- b. Concealed dielectric unions and fittings are not allowed.

### **3.09 UNIONS AND FLANGES**

- a. Install union or flange at each automatic control valve and at each piping specialty or piece of equipment that requires tube pull or removal for maintenance, repair or replacement. If required, provide additional unions or flanges in order to facilitate removal of piping sections that interfere with tube pulls or equipment removal. Where valve is located at piece of equipment, provide flange or union connection on equipment side of valve.
- b. Concealed unions or flanges are not allowed.

**3.10 PIPING SYSTEM PRESSURE TESTS**

- a. Owner and/or Owner's representative may elect to witness pressure test. Notify Owner and/or Owner's representative at least 3 days in advance.
- b. Conduct pressure test prior to flushing and cleaning of piping systems.
- c. Conduct hydrostatic (HYDRO) test in accordance with ASME B31.1 137.4. Test pressure shall be in accordance with ASME B31.1, but shall not be lower than the minimum test pressure listed below.
- d. If leaks are found, repair with new materials and repeat test until leaks are eliminated. Caulking will not be acceptable.
- e. Pressure tests may be made of isolated portions of piping systems to facilitate general progress of installation. Any revisions made in piping systems require retesting of affected portions of piping systems.
- f. No systems shall be insulated until it has been successfully tested. If required for additional pressure load under test, provide temporary restraints at expansion joints or isolate them during test. Unless otherwise noted, minimum test time shall be 4 h plus such additional time as may be necessary to conduct examination for leakage.
- g. No pressure drop shall occur during test period. Any pressure drop during test period indicates leakage.
- h. Provide pumps, gauges, instruments, test equipment, temporary piping and personnel required for tests and provide removal of test equipment and draining of pipes after tests have been made.
- i. For hydrostatic tests, remove air from piping being tested by means of air vents. Measure and record test pressure at high point in system. Where test pressure at high point in system causes excessive pressure at low point in system due to static head, portions of piping system may be isolated and tested separately to avoid undue pressure. However, every portion of piping system must be tested at the specified minimum test pressure.
- j. Conduct pressure tests with parameters indicated below:

<b>PART 4 - System</b>	<u>Minimum Test Pressure</u>	<u>Remarks</u>
Condenser water	100 psig	HYDRO

- a. Contractor shall provide all pumps, gauges, instruments; test equipment, flow meters, temporary piping and personnel required for tests and provide removal of test equipment and draining of pipes after tests have been made.
- b. If piping system is drained after testing and left empty or untreated for more than 3 days, add Nalco 2572 at recommended dosages for dry system lay-up.

**4.02 FLUSHING AND CLEANING PIPING SYSTEMS**

- a. Notify Owner and/or Owner's representative at least 7 days in advance.
- b. Flush new water, fluid, steam and condensate systems thoroughly for 15 minutes or longer, as required to ensure removal of dirt and foreign matter from piping system. Bypass pumps and equipment and remove strainers from strainer bodies. Provide circulation by Contractor-supplied portable pumping apparatus.

- c. Provide temporary piping or hose to bypass coils, control valves, heat exchangers, other factory-cleaned equipment, and any component that may be damaged.
- d. Sectionalize system to obtain minimum velocity of 6 fps. Provide temporary piping to connect dead-end supply and return headers as necessary. Flush bottoms of risers.
- e. After initial flushing of system, use portable pumping apparatus to circulate cold water detergent for water systems.
- f. After initial flushing of system, use portable pumping apparatus for continuous 24 h minimum circulation of cold water detergent similar to Nalco 2567 cleaner. Flush detergent clear with continuous draining and raw water fill for additional 12 h or until all cleaner is removed from system. Replace strainers and reconnect permanent pumping apparatus and all apparatus bypassed.

**4.03 INITIAL SYSTEM FILL AND VENT**

- a. Fill and vent systems with proper working fluids.

**END OF SECTION**

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**SECTION 23 6000**

**PRIMARY COOLING EQUIPMENT**

**PART 1 - GENERAL**

**1.01 RELATED WORK**

- a. Section 20 0513 - Motors
- b. Section 20 0700 - Mechanical Systems Insulation

**1.02 REFERENCE**

- a. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

**1.03 SUBMITTALS**

- a. Shop Drawings for all items in this Section including, but not limited to, the following:
  - 1. Manufacturer's name and model number
  - 2. Identification as referenced in the documents
  - 3. Performance data
  - 4. Sound ratings
  - 5. Materials of construction
  - 6. Dimensions and weights
  - 7. Wiring and interlocking diagrams
  - 8. Motor data (refer to Section 20 0513)
  - 9. Electrical short circuit current ratings (SCCR)
  - 10. All other appropriate data
- b. Submit with unit Shop Drawings, complete interlocking and line diagrams of all electrical wiring required between machine control panel, starter and temperature control devices.
- c. Wiring and interlocking diagram shall include all components of system including, but not limited to chillers, cooling towers, system pumps, automatic valves, flow switches.
- d. Where multiple units are used, diagrams shall incorporate all units.
- e. Prepare diagram specifically for this project. Any incomplete diagrams and shop drawings will be returned without review.

**1.04 CERTIFICATES**

- a. Secure registration and installation permits required by the State and local authorities and complete these requirements before system is placed in operation.

**1.05 COORDINATION**

- a. Intent of plans and Specifications is to provide for complete installation meeting all functional and applicable Code requirements including ASHRAE 15 Safety Code Requirements. Design and drawings are based on one of acceptable manufacturers listed in this Specification.

- b. Where requirements of equipment provided, differs from equipment on which design is based, this Contractor shall be responsible for coordinating requirements of equipment with other Contractors involved. This Contractor shall be responsible for any additional costs incurred due to such requirements.

#### **1.06 OPERATION AND MAINTENANCE DATA**

- a. Manufacturer shall provide for services of factory-trained service engineer to supervise and approve installation; start-up, test and adjust unit for proper operation. Manufacturer shall provide a minimum of 8 h of instruction to Owner's representative in operation and maintenance of machine. This shall include furnishing start-up and test log showing all initial settings and readings; signed by manufacturer's service representative. Provide two additional 16 h training sessions to be scheduled with Owner. Training shall be for up to 8 people.
- b. Before acceptance by Owner, manufacturer shall approve, in writing, complete installation, including piping and wiring connections, and proper functioning of all operational and safety controls.
- c. Equipment electrical connection points shall be labeled with Listed electrical short circuit current rating (SCCR shall not be less than interrupting rating of upstream overcurrent device as shown on electrical drawings). SCCR shall be marked on equipment control enclosure in accordance with UL508, or other acceptable, accredited third-party testing agency standards.

#### **1.07 EXTENDED WARRANTY**

- a. Cooling tower manufacturer shall provide additional 4 yr. mechanical warranty on all rotating equipment excluding motors.
- b. Extended warranty shall start from the date when the 1 yr. guarantee specified in Part 1 of Section 20 0000 ends.

### **PART 2 - PRODUCTS**

#### **2.01 CLOSED CIRCUIT COOLING TOWER (COUNTERFLOW FORCED-DRAFT TYPE FLUID COOLER)**

- a. General:
  - 1. Provide packaged, counterflow, forced-draft type closed circuit cooling towers where shown.
  - 2. Unit manufacturer shall be Marley (Recold), Evapco or approved equal with capacity and operating characteristics as scheduled.
  - 3. Tower shall have wet and dry capacity as scheduled.
  - 4. Tower shall operate against no external static pressure.
- b. Manufacturers: Evapco, BAC, and Marley
- c. Fan Assemblies:
  - 1. Centrifugal fans, statically and dynamically balanced.
  - 2. Bearings to be self-aligning heavy-duty sleeve type with 2 piece cast iron body, deep well reservoir, and oil cup. Provide inlet screens having quick disconnect fasteners for protection and easy access to fans and bearings.
  - 3. Furnish 1750 rpm, drip-proof ball-bearing fan motors suitable for outdoor operation.

4. Design multi V-belt fan drives for not less than 150 percent of motor nameplate horsepower and protect by removable hot-dip galvanized steel screens and panels.
- d. Water Distribution System:
    1. Water to be distributed evenly over tower coil by water distribution system consisting of hot-dip galvanized steel header and spray branches with plastic distribution nozzles. Branches and plastic spray nozzles to be held in place with snap-in rubber grommets providing quick removal of individual nozzles or complete branches for cleaning, or flushing. Header to include provisions for measuring spray pressure externally.
  - e. Collection Basins:
    1. 316 Stainless Steel. Provide access doors, large-area lift-out strainer, and anti-cavitation device. Units shall operate with remote spray water sump and pumps. Provide adequately sized spray water return nozzle.
  - f. Casing:
    1. Heavy gauge, hot-dip galvanized steel finished with zinc-chromatized aluminum.
  - g. Eliminators:
    1. Construct eliminators of hot-dip galvanized steel finished with zinc-chromated aluminum and be removable in easily handled sections. Eliminators shall limit drift losses to no more than 0.005% of design flow rate.
  - h. Spray Coil Assembly:
    1. Water cooling coils shall be completely drainable type constructed of 316 stainless steel with stainless steel fins attached to provide dry capacity as scheduled. Provide drain pass between coils.
  - i. Pumps:
    1. Units shall be provided with integral closed coupled centrifugal pump with mechanical seal.

**PART 3 - EXECUTION**

**3.01 INSTALLATION**

- a. Install equipment as shown on drawings, and in accordance with manufacturer's installation instructions.
- b. Install all necessary auxiliary water piping, pneumatic control tubing, control devices, and drain and vent piping as shown and required by units.
- c. Install necessary piping with insulation for lubricating system cooler if required.

**3.02 VIBRATION TEST**

- a. Vibration shall be measured on site by independent third party testing agency obtained by cooling tower manufacturer. Submit name of third party testing agency to Owner for review and comments. Measured vibration shall not be more than the following:

Fan Speed (rpm)	Maximum Vibration Displacement	Maximum Vibration Velocity
100 - 200	0.25 mm(10.0 mils)	2.03 mm(0.080")/sec.
200 - 300	0.15 mm(6.0 mils)	2.03 mm(0.080")/sec.
300 - 400	0.10 mm(4.0 mils)	2.03 mm(0.080")/sec.

**END OF STATEMENT OF WORK**

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**16. Inspection and Commissioning.** Once Contractor ascertains complete provision of all required work, Contractor shall provide for, schedule, and conduct an inspection of the work area with FDVA Contract Manager, as well as applicable engineers and authorized manufacturer's representatives. During inspection, FDVA Contract Manager and Contractor will develop a punch list of any deficiencies identified and prepare a schedule indicating completion dates for correction. Once Contractor has corrected all deficiencies, upon subsequent FDVA Contract Manager approval of Contractor's inspection and correction of all punch list deficiencies, FDVA Contract Manager will proceed with FDVA Final Acceptance process.

**17. Warranty.** Contractor shall warrant that all work is of highest quality, free from all defects whatsoever, in compliance with manufacturer's specifications and warranty guidelines, as well as applicable local, state, federal codes, laws, ordinances, rules, regulations, guidelines, and requirements. During the warranty period, any defective condition or Contractor damaged item will be repaired or replaced and retested until in compliance with written manufacturer's specifications and warranty guidelines, as well as applicable local, state, federal codes, laws, ordinances, rules, regulations, guidelines, and requirements. Contractor will present FDVA Contract Manager with written warranty which provides:

- a) At minimum, One (1) year manufacturer's warranty on all materials and supplies from date of FDVA Final Acceptance. Date of shipment warranty shall not supersede the One (1) year warranty.
- b) At minimum, One (1) year Contractor warranty on all labor and workmanship from date of FDVA Final Acceptance.

**18. FDVA Final Acceptance.** FDVA Final Acceptance shall be certified upon Contract Manager's receipt and approval of the following closeout requirements:

- a) Contractor completion of required work.
- b) Contractor provision of project documentation, as issued by Contractor, Manufacturer(s), and authorities having jurisdiction (i.e. any applicable project drawings, product data, inspections, approvals, exemptions, certifications, and permissions).
- c) Contractor provision of all warranty documentation.
- d) Contractor removal of all Contractor vehicles, trailers, storage containers, dumpsters, equipment, tools, materials, parts, and supplies.
- e) Contractor proper removal and disposal of all project related waste.
- f) Contractor provision of invoicing in accordance with the Agreement.

**SECTION "IV"**  
**GENERAL AGREEMENT ("DRAFT")**

**THIS AGREEMENT** is made on this \_\_\_\_ day of \_\_\_\_\_, 2020, by and between State of Florida, Department of Veterans' Affairs ("FDVA"), with its principal business location at Mary Grizzle State Office Building, 11351 Ulmerton Road, Suite 311-K, Largo, FL 33778-1630 and \_\_\_\_\_ ("Contractor"), with its principal business location at \_\_\_\_\_.

Each referred to as a "party" or collectively "parties".

**WHEREAS, FDVA issued Invitation to Bid (ITB) No. FDVA-ITB-20-016B** on Thursday, January 30th, 2020 for contractor provision of all vehicles, trailers, storage containers, dumpsters, labor, services, equipment, tools, materials, parts, and supplies required for the replacement of two (2) HVAC Cooling Towers for the Condensed Water Loop for the Baldomero Lopez State Veterans' Nursing Home, located at 6919 Parkway Blvd., Land O' Lakes, Florida 34639. For further details, see Section III "Statement of Work".

**WHEREAS,** Contractor submitted a Response (Bid) to the ITB on \_\_\_\_\_, 2020; and

**WHEREAS,** FDVA awarded the ITB Submittal to Contractor and the parties wish to set forth the terms and conditions of their agreement.

**NOW THEREFORE,** the parties in consideration of the mutual benefits and promises set forth herein, the adequacy of which is acknowledged by the parties, agree as follows:

**1.1 DOCUMENTS:**

1.1.1 The contract documents, including without limitation all exhibits attached hereto and incorporated herein by this reference, sets forth the entire agreement between the parties with respect to the subject matter hereof and supersedes all previous written or oral agreements or representations between the parties with respect hereto.

1.1.2 To the extent of any conflict between the contract documents, this Agreement and any amendments shall control:

- Then FDVA ITB and all Addendum (attached hereto as Exhibit A);
- Then Contractor's Bid (attached hereto as Exhibit B);
- Then FDVA Purchase Order; and
- Then any other exhibits as required.

All of the foregoing are incorporated herein by reference and are made a part of this Agreement.

**2.1 GENERAL DESCRIPTION OF SERVICES:**

2.1.1 Contractor shall provide all vehicles, trailers, storage containers, dumpsters, labor, services, equipment, tools, materials, parts, and supplies required for the Baldomero Lopez State Veterans' Nursing Home, located at 6919 Parkway Blvd., Land O' Lakes, Florida 34639, as set forth in the Agreement.

2.1.2 Contractor shall complete the tasks as outlined in the ITB and any issued addendum, as well as all services and work not mentioned, but necessary for Contractor to complete the work outlined in the Contract Documents.

2.1.3 Contractor is responsible for securing any and all licenses, permits, special variances, inspections, approvals, exemptions, and permissions required to complete the work called for by the Contract Documents, including coordinating and notifying any agencies, prior to, during, and after the work, which require such communication(s).

**3.1 TERM OF SERVICE:**

3.1.1 The term of this Contract shall commence on the date of the Agreement's full execution, with no renewals. FDVA requires specified services to be completed to the full satisfaction and acceptance of

FDVA and any applicable authorities having jurisdiction, within one-hundred and sixty (160) calendar days from the date of Agreement's full execution.

3.1.2 Termination of this Contract shall be governed by the provisions specified in incorporated Form PUR 1000, Item No. 22 "Termination for Convenience" and Item No. 23 "Termination for Cause".

#### **4.1 CONTRACT SUM AND TERMS OF PAYMENT:**

4.1.1 In consideration of Contractor's faithful performance of the covenants in this Agreement and its completion and delivery of the statement of work as outlined in the Contract Documents, to the full satisfaction and acceptance of FDVA and any applicable authorities having jurisdiction; FDVA agrees to pay or cause to be paid a total contract sum not to exceed \$TBD, as set forth in Contractor's Bid. The State's performance and obligation to pay under the Agreement is contingent upon an annual appropriation by the State of Florida Legislature.

4.1.2 It is agreed that Contractor's expenses, including but not limited to all costs related to travel and lodging, printing and photocopying, long distance telephone calls and facsimiles, and overnight delivery services, are included in the sum listed in 4.1.1 above.

4.1.3 FDVA does not pay any excise or sales tax and shall provide to the Contractor sales tax exemption information, where appropriate.

4.1.4 During the performance of the services under this Agreement, FDVA shall have the right, by written instrument, to make changes in, omissions from, or to require additions to the services called for by the Contract Documents. Contractor must receive prior written approval from FDVA before beginning any additional services related to the work under the Contract Documents. In the event that FDVA provides prior written approval for additional services, then, upon completion of such additional services, Contractor shall be entitled to compensation for the additional services rendered at the rate(s) or price(s) set forth in the Bid, or as otherwise mutually agreed upon by the parties in writing. If Contractor performs additional services without first receiving prior written approval from FDVA, Contractor shall not be entitled to compensation for the unapproved services.

4.1.5 Vendors have the option to receive payments by direct deposit. With direct deposit, your money will be available to you when your financial institution opens for business on the payment date. Banks, savings and loan associations, and credit unions are eligible to accept such deposits. With direct deposit there can be only one financial institution's account information on file for one federal tax identification number (SSN or FEIN). Payments cannot be sent to two or more financial institutions. If you are interested in this option to receive your payments in a more efficient method of payment, please complete the Direct Deposit Authorization form located at website <https://www.myfloridacfo.com/division/AA/Forms/DFS-A1-26E.docx> and follow the instructions on the form. If you need assistance completing the form, please call the Direct Deposit Section at (850) 413-5572 or email at [DirectDeposit@MyFloridaCFO.com](mailto:DirectDeposit@MyFloridaCFO.com). Also, Vendors can obtain the remittance information contained on the remittance advice by accessing the "Vendor Payment History" link located on the State of Florida Vendor Website: <https://flvendor.myfloridacfo.com/>.

#### **5.1 DELIVERABLES:**

5.1.1 The deliverable, as defined in the agreement, is for the replacement of two (2) HVAC Cooling Towers for the Condensed Water Loop.

#### **6.1 PERFORMANCE MEASURES:**

6.1.1 Performance measures will be based on the quality and timeliness of the deliverables as determined solely by FDVA.

#### **7.1 INVOICING AND PAYMENT:**

7.1.1 Invoicing: Contractor shall submit invoicing to the attention of FDVA Contract Manager. FDVA Contract Manager shall be responsible for monitoring Contractor performance of the Agreement and certifying invoices for payment. Invoices shall be submitted in detail sufficient for a proper pre-audit and post-audit thereof, including all supporting documentation. Invoices shall specify Contractor's Federal Employer Identification Number (FEIN), FDVA Agreement number, FDVA purchase order number, actual period of service, specific line item description(s), as well as reflect the service location name and address.

Invoices must reflect Contractor's net, delivered prices (F.O.B. destination) and be in United States Dollars (USD). Contractor invoicing shall be in accordance with and not exceed the sum specified in the Agreement.

7.1.2 Payment: FDVA is unable to pay in advance for any vehicles, trailers, storage containers, dumpsters, labor, services, equipment, tools, materials, parts, and supplies (whether pre-staged, staged, stored or otherwise). Payments shall only be issued for actual Contractor completed work; work which has been certified as accepted and approved by FDVA Contract Manager and any applicable authorities having jurisdiction. FDVA payment shall be made in accordance with Section 215.422, Florida Statutes, which states Contractor's rights and State Agency's responsibilities concerning interest penalties and time limits for payment of invoices.

#### **8.1 FINANCIAL CONSEQUENCES:**

8.1.1 Pursuant to Section 287.058(1)(h), Florida Statutes, in the event of delay in the provision of required services, not subject to unavoidable delays, FDVA must recover its actual costs which it estimates at this time to be in the amount of **\$1,250.00** per each calendar day that the Contractor has failed to provide the required services in accordance with the Agreement. FDVA reserves the right to increase this amount if the actual financial consequences to FDVA caused by Contractor's delay are higher. Deductions must be made from monies due or which may be due to the Contractor. The burden of proof of unavoidable delay shall rest with the Contractor. Contractor shall submit written notice requesting extension of time to FDVA Contract Manager for determination. FDVA, at its sole discretion, may approve extensions of the project completion date if delay is attributable to circumstances that are beyond the control of the Contractor. If FDVA approves extension of time, a change order must be used to incorporate the extension in the executed Agreement.

8.1.2 Contractor shall be solely responsible for the correction of all applicable deficiencies, tags, and citations; and will be liable for payment of any monetary fine, or reimbursement of per diem lost, if such fine or per diem lost is the result of any deficiency that is found by a licensure or certification entity and that is attributable to the Contractor.

#### **9.1 BACKGROUND SCREENING:**

9.1.1 In accordance with Section 435, Florida Statutes, for the life of the Agreement, Contractor shall be responsible for scheduling, applying and paying for, and securing Level 2 background screening for all Contractor personnel, agents, representatives, subcontractors and their employees, and all other persons performing services in performance of the Agreement. Upon completion of Level 2 background screening, Contractor shall secure evidence of such completion and provide to FDVA Contract Manager. Prior to commencement of work, FDVA Contract Manager and SVNH Administrator will review each **Level 2** background screening's result and exercise exclusive judgment as to acceptability in accordance with State of Florida requirements. Evidence will be maintained on file at the service location.

#### **10.1 EMPLOYMENT ELIGIBILITY VERIFICATION (E-Verify):**

10.1.1 Pursuant to the State of Florida Executive Order Number 11-116 the U.S. Department of Homeland Security's E-Verify system to obtain and verify the employment eligibility of all persons employed during the term of the Agreement by the Contractor to perform employment duties within Florida within three (3) business days after the date of hire; and all persons (including subcontractors) assigned by Contractor to perform work pursuant to the Agreement with FDVA within ninety (90) calendar days after the date the Agreement is executed or within thirty (30) days after such persons are assigned to perform work pursuant to the Agreement, whichever is later. The State of Florida shall consider Contractors' employment of an unauthorized or undocumented alien to be a *prima facie* violation of the Immigration and Nationality Act. Such violation shall be grounds for immediate termination of the Agreement.

#### **11.1 INSURANCE REQUIREMENTS:**

11.1.1 Within fifteen (15) business days, from date of fully executed agreement, Contractor must obtain the below specified insurance coverage and provide certificate of insurance to FDVA Contract Manager. FDVA acceptance of Contractor's certificate of insurance shall not be construed as relieving Contractor from liability or obligation assumed under the Agreement or as imposed by law.

11.1.2 Insurer must be authorized to do business in and be eligible to write policies in the State of Florida, as well as maintain a minimum rating of "A" as assigned by AM Best. Certificate of insurance will



specify that coverage is not subject to cancellation, non-renewal, material change, or reduction unless thirty (30) calendar days' notice is given to FDVA. Certificate of insurance shall include the license and registration numbers of the Florida resident agent, as well as list FDVA as additionally insured (excluding worker's compensation insurance). Contractor insurance coverages shall include the following:

Commercial General Liability Requirements:

- Premises Operations.
- Produces and Completed Operations.
- Blanket Contractual Liability.
- Personal Injury Liability.
- Expanded Definition of Property Damage.
- Professional Liability.
- Minimum limits shall be \$1,000,000.00, each occurrence, combined single limit.

Excess Liability:

- Umbrella form.
- Minimum limits shall be \$3,000,000.00 each occurrence, combined single limit.

Workers Compensation:

- Workers compensation insurance for all Contractor employees connected to this Agreement.
- Limits sufficient to meet Chapter 440, Florida Statutes.
- If Contractor has been approved by the State of Florida's Department of Labor as an authorized self-insurer (self-insurance fund) for Workers' Compensation, FDVA shall recognize and honor such status. Contractor shall be required to submit to FDVA Contract Manager a letter of authorization issued by the State of Florida's Department of Labor, certificate of insurance providing details on Contractor's excess insurance program, and Contractor's financial statements.

Vehicle Liability Insurance:

- Liability coverage to include any auto, all owned autos, non-owned autos, hired autos, and scheduled autos.
- Minimum limits shall be at \$1,000,000, each occurrence, combined single limit.
- If split limits are given, minimum limits shall be \$500,000 per person; \$1,000,000 per occurrence; \$500,000 property damage.

11.1.3 Contractor failure to provide insurance coverage, as specified above, shall prevent commencement of all work until Contractor provides satisfactory evidence of insurance coverage to FDVA Contract Manager or may result in termination of Agreement. Further, Contractor failure to maintain insurance coverage for the life of the Agreement shall result in suspension of all work until such insurance coverage has been reinstated or replaced, and satisfactory evidence of insurance coverage has been provided to FDVA Contract Manager or may result in termination of Agreement. Additionally, Contractor failure to obtain, provide satisfactory evidence of, and maintain insurance coverages shall not extend deadlines and FDVA shall impose financial consequences as if work had commenced as scheduled or not been suspended.

**12.1 PERFORMANCE AND PAYMENT BOND:**

12.1.1 Within fifteen (15) business days, from date of fully executed agreement, Contractor must obtain the below specified performance and payment bond and provide FDVA Contract Manager with original bond and power of attorney (for the attorney providing the bond); as well as a certified copy of the recorded bond (Charlotte County), including properly executed and recorded power of attorney (for the attorney providing the bond). **Note:** See ITB solicitation affixed Form "8" Performance and Payment Bond (draft; State of Florida/FDVA approved language).

12.1.2 Bond will remain in effect for the life of the Agreement and be from a surety company which:

- Is at minimum rated "A –" (excellent) and Class "IV" (financial size category), as reported in the most current Best Key Rating Guide, published by A.M. Best Company, with the required amount not to exceed ten (10) percent of its surplus to policyholder;
- Holds a currently valid Certificate of Authority, issued by the State of Florida, Department of Financial Services, Office of Insurance Regulation, authorizing it to write surety bonds in the State of Florida;
- Holds a Certificate of Authority issued by the United States Department of Treasury under Sections 9304 to 9308 of Title 31 of the United States Code;

- Is fully compliant with the provisions of the State of Florida Insurance Code; and
- Has at least twice the minimum surplus and capital required by the State of Florida Insurance Code at the time the subject solicitation was issued.
- Bond shall be accompanied by a duly authenticated power of attorney evidencing that the person executing the bond in behalf of the surety company had the authority to do so on the date of the bond. Further, bond shall state in its front page:
  - Contractor's name, principle business address, and phone number;
  - Surety company name;
  - FDVA's full name (Florida Department of Veterans' Affairs), as beneficiary;
  - Agreement number as assigned by FDVA;
  - General description of the required commodity or project; and
  - Reflect bond amount equal to 100% of the Agreement's full value.

12.1.3 Contractor failure to provide bond, as specified above, will prevent commencement of all work until Contractor provides satisfactory evidence of bond to FDVA Contract Manager or may result in termination of Agreement. Further, Contractor failure to maintain bond for the life of the Agreement will result in suspension of all work until such bond has been reinstated or replaced, and satisfactory evidence of bond has been provided to FDVA Contract Manager or may result in termination of Agreement. Additionally, Contractor failure to obtain, provide satisfactory evidence of, and maintain bond will not extend deadlines and FDVA will impose financial consequences as if work had commenced as scheduled or not been suspended.

12.1.4 Bond will provide that the surety company pay losses suffered by FDVA directly to FDVA, including losses for material breaches based on violations of Florida public records law through failure to produce public records or improper disclosure of confidential or exempt structural documents as described in the Agreement. In the event of termination of the Agreement by Contractor prior to full performance, Contractor agrees that FDVA damages shall be considered to be for the full amount of the bond. FDVA need not prove the damage amount in exercising its right of recourse against the bond.

12.1.5 In the event of material change or cancellation of the bond, Contractor must provide a substitute bond naming FDVA as the payee to FDVA Contract Manager within five (5) business days thereafter. If the surety company for any bond provided by Contractor is declared bankrupt, becomes insolvent, has its right to do business in the State of Florida terminated, or ceases to meet the requirements imposed by the Agreement, the Contractor shall provide a substitute bond within five (5) business days thereafter to the FDVA Contract Manager. Both the substitute surety company and bond shall be subject FDVA's sole approval.

### **13.1 APPLICABLE LEGAL STANDARDS:**

13.1.1 Contractor shall comply with all local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction that, in any manner, could bear on the provision of services under the Contract Documents.

13.1.2 As between the parties, Contractor shall obtain and maintain at its own expense all licenses, permits, approvals, and regulatory authority required by law with respect to Contractor's operation and provision of services as contemplated in the Contract Documents, and FDVA shall obtain and maintain at its own expense all licenses, permits, approvals, and regulatory authority required by law with respect to FDVA's use of the services contemplated in the Contract Documents. Unless specified otherwise in the Contract Documents, each party will give all notices, pay all fees, and comply with all local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction relating to its performance obligations specified in this Agreement.

13.1.3 If the Contractor provides services in a manner that it knows is contrary to any local, state, and federal codes, laws, ordinances, rules, regulations, guidelines, requirements, and any applicable authorities having jurisdiction, or that the Contractor should have known was contrary to the same, the Contractor shall assume full responsibility for such services and shall bear all attributable costs.

13.1.4 If the contract sum is for \$1 million dollars or more, and the Contractor is subsequently placed on the Scrutinized Companies with Activities in Sudan List or Scrutinized Companies with Activities in Iran Petroleum Energy Sector List, or has been found to have submitted a false certification representing that Contractor has not been placed on these lists, or is engaged in business operations in Cuba or Syria, then FDVA may terminate this agreement, pursuant to section 287.135, Florida Statutes and section 215.473, Florida Statutes.

**14.1 NOTICES:**

14.1.1 All notices required under the Contract shall be delivered by certified mail, return receipt requested, by reputable air courier service, or by personal delivery to the agency designee identified in the original solicitation, or as otherwise identified by the Customer. Notices to the Contractor shall be delivered to the person who signs the Contract. Either designated recipient may notify the other, in writing, if someone else is designated to receive notice.

**15.1 MODIFICATION:**

15.1.1 The Contract contains all the terms and conditions agreed upon by the parties, which terms and conditions shall govern all transactions between the Customer and the Contractor. The Contract may only be modified or amended upon mutual written agreement of the Customer and the Contractor. No oral agreements or representations shall be valid or binding upon the Customer or the Contractor. No alteration or modification of the Contract terms, including substitution of product, shall be valid or binding against the Customer. The Contractor may not unilaterally modify the terms of the Contract by affixing additional terms to product upon delivery (e.g., attachment or inclusion of standard preprinted forms, product literature, "shrink wrap" terms accompanying or affixed to a product, whether written or electronic) or by incorporating such terms onto the Contractor's order or fiscal forms or other documents forwarded by the Contractor for payment. The Customer's acceptance of product or processing of documentation on forms furnished by the Contractor for approval or payment shall not constitute acceptance of the proposed modification to terms and conditions.

**16.1 SUCCESSORS AND ASSIGNS:**

16.1.1 The Contractor shall not sell, assign or transfer any of its rights, duties or obligations under the Contract, or under any purchase order issued pursuant to the Contract, without the prior written consent of the Customer; provided, the Contractor assigns to the State any and all claims it has with respect to the Contract under the antitrust laws of the United States and the State. In the event of any assignment, the Contractor remains secondarily liable for performance of the contract, unless the Customer expressly waives such secondary liability. The Customer may assign the Contract with prior written notice to Contractor of its intent to do so.

**17.1 RIGHT TO INSPECT and AUDIT:**

17.1.1 Right to Inspect and Audit: In accordance with Article I, Section 24, Florida State Constitution and Chapter 119, Florida Statutes, FDVA, its duly authorized representatives, federal and state auditors, and other persons shall have the right to inspect and audit any facilities, commodities, services, materials, records, papers, documents, drawings, books, and electronic storage media of Contractor and subcontractor(s) which FDVA and its duly authorized representatives deem relevant to the purposes of this Agreement.

- All information requested to be delivered, for purposes of inspection and audit, shall be furnished to FDVA and its duly authorized representatives within three (3) business days from date of FDVA provision of notice.
- At its sole discretion, without notice, FDVA and its duly authorized representatives may conduct audits at any location during normal business days and hours.
- If an audit has been initiated and audit findings have not been resolved, the information shall be retained until resolution of the audit findings.
- The rights of access must not be limited to the required retention periods but shall be provided for as long as the records are retained and deemed relevant to the Agreement by FDVA and its duly authorized representatives.
- Under the Agreement, Contractor shall be solely responsible for all storage, maintenance, preparation, duplication, transfer, delivery, and disposal; as well as any associated costs or fees.
- Contractor's failure to provide retention of and access to the above detailed, as well as any violation of Chapter 119, Florida Statutes will be sufficient grounds for immediate termination of the Agreement. Further, under Florida law, noncompliance remedies may include criminal prosecution and civil actions.

17.1.2 Inspector General: Pursuant to Section 20.055(5), Florida Statutes, every state officer, employee, agency, special district, board, commission, contractor and subcontractor corporation, partnership, or

person must understand, cooperate, and comply with the inspector general in any investigation, audit, inspection, review, or hearing.

17.1.3 Chief Financial Officer: Pursuant to Section 287.136, Florida Statutes, after execution of a contract, the Chief Financial Officer shall perform audits of the executed contract document and contract manager's records to ensure that adequate internal controls are in place for complying with the terms and conditions of the contract and for the validation and receipt of goods and services.

## 18.1 **PUBLIC RECORDS:**

18.1.1 Article 1, section 24, Florida Constitution, guarantees every person access to all public records, and Section 119.011, Florida Statutes, provides a broad definition of public record. All responses to a competitive solicitation are public records unless exempt by law.

18.1.2 In accordance with Florida Statute 215.985, the State of Florida Department of Financial Services (DFS) has implemented the web-based Florida Accountability Contract Tracking System (FACTS). All State of Florida contracts are considered public records and shall be published to FACTS for public access. Published records include but are not limited to contract document images, financial information, and audit findings. Online public access is available via "<https://facts.fldfs.com>."

18.1.3 Any respondent claiming that its response to a competitive solicitation contains information that is exempt from the public records law such as a "trade secret," shall clearly segregate and mark that information, and provide the specific statutory authority for such exemption. If under contract, it is expressly understood that a Contractor's refusal to comply with this provision shall constitute a breach of contract.

18.1.4 Pursuant to the provisions of Section 119.0701, Florida Statutes, Contractor shall:

- Keep and maintain public records required by the public agency to perform the service.
- Upon request from the public agency's custodian of public records, provide the public agency with a copy of the requested records or allow the records to be inspected or copied within a reasonable time and at a cost that does not exceed the costs provided for under Florida's public records law.
- Ensure that public records that are exempt or confidential and exempt from public records disclosure requirements are not disclosed except as authorized by law for the duration of the contract term and following completion of the contract if the Contractor does not transfer the records to the public agency.
- Upon completion of the contract, transfer, at no cost, to the public agency all public records in possession of the Contractor or keep and maintain public records required by the public agency to perform the service. If the Contractor transfers all public records to the public agency upon completion of the contract, the Contractor shall destroy any duplicate public records that are exempt or confidential and exempt from public records disclosure requirements. If the Contractor keeps and maintains public records upon completion of the contract, the Contractor shall meet all applicable requirements for retaining public records. All records stored electronically must be provided to the public agency, upon request from the public agency's custodian of public records, in a format that is compatible with the information technology systems of the public agency.
- Notwithstanding these provisions, a request to inspect or copy public records relating to a public agency's contract for services must be made directly to the public agency. Therefore, if the contractor receives a request to inspect or copy public records, the Contractor shall immediately contact the agency's Custodian of Public Records for disposition.
- Contractor's failure to provide retention of and access to public records, as well as any violation of Chapter 119, Florida Statutes will be sufficient grounds for immediate termination of the Agreement. Further, under Florida law, noncompliance remedies may include criminal prosecution and civil actions.

18.1.5 Pursuant to Section 119.0701, Florida Statutes, **IF THE CONTRACTOR HAS QUESTIONS REGARDING THE APPLICATION OF CHAPTER 119, FLORIDA STATUTES, TO THE CONTRACTOR'S DUTY TO PROVIDE PUBLIC RECORDS RELATING TO THIS CONTRACT, CONTACT FLORIDA DEPARTMENT OF VETERANS' AFFAIRS, CUSTODIAN OF PUBLIC RECORDS, 11351 ULMERTON ROAD,**

**SUITE 311-K, LARGO, FL 33778-1630, PHONE NUMBER: (727) 518-3202, EXTENSION NUMBER 5594, E-MAIL ADDRESS: [PUBLICRECORDSREQUEST@FDVA.STATE.FL.US](mailto:PUBLICRECORDSREQUEST@FDVA.STATE.FL.US).**

**19.1 CLOSING:**

19.1.1 In the event any portion of the Contract Documents shall be declared by any court of competent jurisdiction to be invalid or unenforceable, the parties agree that such invalid or unenforceable portion shall be severable and the Contract Documents shall be treated as though that portion had never been part of the Contract Documents.

19.1.2 The headings of the sections of this Agreement and capitalizations are for the purpose of convenience only and shall not be deemed to expand or limit the provisions contained in such sections.

19.1.3 Both parties to this Agreement represent and warrant that they are authorized to enter into this Agreement without the consent and joinder of any other party and that the parties executing this Agreement have full power and authority to bind their respective parties to the terms hereof.

19.1.4 Contractor understands and agrees it shall be bound by all the terms and conditions of this Agreement, as well as such terms and conditions set forth in Invitation to Bid (ITB) Number FDVA-ITB-20-016B and any issued addendum.

19.1.5 This Agreement shall be governed by the laws of the State of Florida, and the parties stipulate any matter, action or proceeding, which is the subject of this Contract, shall be held in the State courts of Leon County, Florida or the U.S. District Court for the Northern District of Florida, Tallahassee Division, located in Leon County, Florida.

**IN WITNESS WHEREOF**, the parties signing below represent that they are duly-authorized to bind the agency, and hereby execute this Agreement on their behalf, as of the Effective Date as signed by FDVA .

**Contractor:**

**State of Florida Department of Veterans' Affairs:**

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

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

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

Date: \_\_\_\_\_

Date: \_\_\_\_\_

**Corporate Secretary Attestation:**

**As approved to form and legality by:**

Signature: \_\_\_\_\_

Signature: \_\_\_\_\_

Print Name: \_\_\_\_\_

Print Name: \_\_\_\_\_

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

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

Date: \_\_\_\_\_

Date: \_\_\_\_\_

**FORM "1"**  
**BIDDER'S ACKNOWLEDGMENT**

**SOLICITATION NO.: FDVA-ITB-20-016B**  
**SOLICITATION TITLE: FLUID COOLER REPLACEMENT**  
**SOLICITATION ISSUED: THURSDAY, JANUARY 30TH, 2020**

**BID DUE DATE AND TIME:** IN ACCORDANCE WITH THE SOLICITATION TIMELINE (SOLICITATION SECTION "I") AND RESPONDENT INSTRUCTIONS (SOLICITATION SECTION "II"), RESPONDENT BIDS MUST BE DELIVERED PRIOR TO 3:00 PM LOCAL TIME, ON TUESDAY, MARCH 3<sup>RD</sup>, 2020. BIDS SHALL NOT BE WITHDRAWN WITHIN SIXTY (60) BUSINESS DAYS AFTER SUCH DATE AND TIME.

**DELIVERY OF BID:** IN ACCORDANCE WITH THE SOLICITATION TIMELINE (SOLICITATION SECTION "I") AND RESPONDENT INSTRUCTIONS (SOLICITATION SECTION "II"), RESPONDENT BID MUST BE DELIVERED TO: RODRIGO PASION, PURCHASING SPECIALIST, FLORIDA DEPARTMENT OF VETERANS AFFAIRS, MARY GRIZZLE STATE OFFICE BUILDING, 11351 ULMERTON ROAD, SUITE 311-K, LARGO, FL 33778-1630.

**SPECIAL NOTICE TO RESPONDENT:** A MANDATORY PRE-BID AND ON-SITE MEETING HAS BEEN SCHEDULED FOR THIS SOLICITATION, DETAILS ARE PROVIDED IN SOLICITATION SECTION "I".

<b>CONTRACTOR NAME:</b>	
<b>MAILING ADDRESS (PHYSICAL STREET):</b>	<b>PHONE:</b>
<b>CITY / STATE / ZIP CODE:</b>	<b>FAX:</b>
<b>FEDERAL TAX ID NUMBER:</b>	<b>E-MAIL ADDRESS:</b>

FORM	SUBMITTALS CHECKLIST (ALL FORMS BELOW MUST BE INCLUDED WITH RESPONDENT'S BID)	CHECK OFF BOX
FORM 1	BIDDER'S ACKNOWLEDGMENT	
FORM 2	BID FORM	
FORM 3	CONTRACTOR REFERENCES	
FORM 4	ADDENDUM ACKNOWLEDGMENT	
FORM 5	ATTESTATION OF NO CONFLICT	
FORM 6	DRUG-FREE WORKPLACE CERTIFICATION	
FORM 7	NON-COLLUSION AFFIDAVIT	

*BY SIGNING THIS DOCUMENT, I CERTIFY UNDER PENALTY OF PERJURY, THAT I AM DULY AUTHORIZED TO LEGALLY BIND THE RESPONDENT TO THE TERMS, CONDITIONS, PROVISIONS, AND REQUIREMENTS EXPRESSED IN THE SUBJECT SOLICITATION, ANY PUBLISHED ADDENDUM, AND THIS BID DOCUMENT. THIS CERTIFICATION IS MADE UNDER THE LAWS OF THE STATE OF FLORIDA.*

<b>PRINT NAME &amp; TITLE OF AUTHORIZED REPRESENTATIVE:</b>	
<b>SIGNATURE OF AUTHORIZED REPRESENTATIVE:</b>	<b>DATE:</b>

**FORM "2"**  
**BID FORM**

CONTRACTOR MUST INCLUDE THIS FORM FULLY EXECUTED, IN THE PROVIDED FORMAT, WITH RESPONSE TO THIS SOLICITATION. FAILURE TO FULLY EXECUTE AND SUBMIT THIS FORM MAY RESULT IN CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

**SOLICITATION NO.:** FDVA-ITB-20-016B

**SOLICITATION TITLE:** FLUID COOLER REPLACEMENT

**INVITATION TO BID (ITB) DESCRIPTION:** CONTRACTOR SHALL PROVIDE ALL VEHICLES, TRAILERS, STORAGE CONTAINERS, DUMPSTERS, LABOR, SERVICES, EQUIPMENT, TOOLS, MATERIALS, PARTS, AND SUPPLIES REQUIRED TO ACHIEVE SPECIFIED REPLACEMENT OF TWO (2) HVAC COOLING TOWERS FOR THE CONDENSED WATER LOOP FOR THE BALDOMERO LOPEZ STATE VETERANS' NURSING HOME LOCATED AT 6919 PARKWAY BLVD. LAND O' LAKES, FLORIDA 34639 AS SET FORTH IN THE AGREEMENT.

CONTRACTOR TOTAL PROJECT BID PRICE SHALL BE INCLUSIVE OF ALL REQUIREMENTS AND RELATED COSTS AS STATED IN THIS SOLICITATION AND ANY ADDENDUM ISSUED PRIOR TO BID OPENING DUE DATE AND TIME. TOTAL PROJECT BID PRICE MUST BE IN NUMERICAL U.S. DOLLARS. RESPONSES SUCH AS SYMBOLS, ABBREVIATIONS, "ESTIMATE", "PENDING", "TBD", "TBA", AND THE LIKE THEREOF WILL RESULT IN RESPONDENT BID BEING CONSIDERED NON-RESPONSIVE AND REJECTED.

**CONTRACTOR TOTAL PROJECT BID PRICE:** \$ \_\_\_\_\_.

**PROJECT COMPLETION:** FDVA REQUIRES SPECIFIED SERVICES TO BE COMPLETED TO THE FULL SATISFACTION AND ACCEPTANCE OF FDVA AND ANY APPLICABLE AUTHORITIES HAVING JURISDICTION, WITHIN ONE-HUNDRED -SIXTY (160) CALENDAR DAYS FROM THE DATE OF AGREEMENT'S FULL EXECUTION.

**CONTRACTOR ESTIMATED TIME FOR COMPLETION** \_\_\_\_\_ **CALENDAR DAYS.**

CONTRACTOR'S NAME: \_\_\_\_\_

MAILING ADDRESS (PHYSICAL STREET): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

CONTRACTOR'S FEDERAL I.D. #: \_\_\_\_\_

TELEPHONE #: \_\_\_\_\_

FAX #: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

PERSON TO CONTACT AFTER AWARD: \_\_\_\_\_

*ACKNOWLEDGEMENT: AS THE PERSON AUTHORIZED TO SIGN ON BEHALF OF THE CONTRACTOR, I CERTIFY THAT I HAVE READ AND AGREE TO ABIDE BY ALL TERMS AND CONDITIONS OF THIS SOLICITATION, AND THAT THIS BID IS MADE IN ACCORDANCE WITH ALL REQUIREMENTS OF THE SOLICITATION AND ANY ISSUED ADDENDUM.*

AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

**FORM "3"**  
**CONTRACTOR REFERENCES**

CONTRACTOR MUST INCLUDE THIS FORM FULLY EXECUTED, IN THE PROVIDED FORMAT, WITH RESPONSE TO THIS SOLICITATION. FAILURE TO FULLY EXECUTE AND SUBMIT THIS FORM MAY RESULT IN CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

CONTRACTOR'S NAME: \_\_\_\_\_

MAILING ADDRESS (PHYSICAL STREET): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

TELEPHONE #: \_\_\_\_\_

FAX #: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

HOW LONG IN PRESENT LOCATION: \_\_\_\_\_

AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

IN THE FOLLOWING BELOW PROVIDED SPACES, CONTRACTOR SHALL LIST ANY NAMES UNDER WHICH IT OPERATED DURING THE PAST FIVE (5) YEARS:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

THE FOLLOWING INFORMATION IS REQUIRED IN ORDER TO PROPERLY EVALUATE CONTRACTOR'S RESPONSE TO THIS SOLICITATION. CONTRACTOR MUST PROVIDE FOUR (4) VERIFIABLE CLIENT REFERENCES IN THE ENGAGED INDUSTRY. REFERENCES LISTED MUST BE FOR COMMODITIES OR SERVICES SIMILAR IN NATURE TO THAT REQUIRED BY THIS SOLICITATION.

THE SAME CLIENT MAY NOT BE LISTED FOR MORE THAN ONE (1) REFERENCE AND CONFIDENTIAL CLIENTS SHALL NOT BE INCLUDED. SUBCONTRACTORS LISTED AS REFERENCES WILL NOT BE ACCEPTED. ENTITIES HAVING AN AFFILIATION WITH THE CONTRACTOR (I.E. CURRENTLY PARENT, SUBSIDIARY HAVING COMMON OWNERSHIP, HAVING COMMON DIRECTORS, OFFICERS OR AGENTS OR SHARING PROFITS OR LIABILITIES) WILL NOT BE ACCEPTED AS REFERENCES.

IN THE EVENT THE CONTRACTOR HAS HAD A NAME CHANGE SINCE THE TIME SIMILAR COMMODITIES OR SERVICES WERE PERFORMED FOR A LISTED REFERENCE, THE NAME UNDER WHICH THE CONTRACTOR OPERATED AT THAT TIME MUST ALSO BE PROVIDED ADJACENT TO THE SPACE PROVIDED FOR CONTRACTOR NAME.

REFERENCES SHOULD BE AVAILABLE FOR CONTACT DURING NORMAL BUSINESS HOURS: 8:00 AM TO 5:00 PM LOCAL TIME. FDVA WILL ATTEMPT TO CONTACT EACH REFERENCE TWO (2) TIMES. IN THE EVENT THE REFERENCE CANNOT BE REACHED, FDVA WILL REQUEST CONTRACTOR TO PROVIDE AN ALTERNATE REFERENCE WITHIN ONE (1) BUSINESS DAY. CONTRACTOR FAILURE TO PROVIDE ALTERNATE REFERENCE WITHIN THE REQUIRED TIME MAY RESULT IN THE CONTRACTOR BEING CONSIDERED NON-RESPONSIVE. FDVA WILL NOT ATTEMPT TO CORRECT AGED OR INCORRECTLY SUPPLIED INFORMATION.

ADDITIONALLY, FDVA RESERVES THE RIGHT TO CONTACT CLIENTS OTHER THAN THOSE IDENTIFIED BY THE CONTRACTOR IN ORDER TO OBTAIN ADDITIONAL INFORMATION REGARDING CONTRACTOR PAST PERFORMANCE. ANY INFORMATION OBTAINED AS A RESULT OF SUCH CONTACT MAY BE USED TO DETERMINE WHETHER OR NOT THE CONTRACTOR IS A "RESPONSIBLE CONTRACTOR", AS DEFINED IN SECTION 287.012 (24), FLORIDA STATUTES.



**REFERENCE NUMBER 1:**

CONTRACTOR NAME: \_\_\_\_\_

CLIENT NAME: \_\_\_\_\_

PHYSICAL STREET ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

PRIMARY CONTACT NAME: \_\_\_\_\_

PRIMARY CONTACT PHONE NUMBER: \_\_\_\_\_

PRIMARY CONTACT EMAIL ADDRESS: \_\_\_\_\_

CONTRACT PERFORMANCE PERIOD: \_\_\_\_\_

LOCATION OF SERVICES: \_\_\_\_\_

BRIEF DESCRIPTION OF SIMILAR COMMODITIES OR SERVICES PROVIDED BY CONTRACTOR TO THIS CLIENT:

**REFERENCE NUMBER 2:**

CONTRACTOR NAME: \_\_\_\_\_

CLIENT NAME: \_\_\_\_\_

PHYSICAL STREET ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

PRIMARY CONTACT NAME: \_\_\_\_\_

PRIMARY CONTACT PHONE NUMBER: \_\_\_\_\_

PRIMARY CONTACT EMAIL ADDRESS: \_\_\_\_\_

CONTRACT PERFORMANCE PERIOD: \_\_\_\_\_

LOCATION OF SERVICES: \_\_\_\_\_

BRIEF DESCRIPTION OF SIMILAR COMMODITIES OR SERVICES PROVIDED BY CONTRACTOR TO THIS CLIENT:

**REFERENCE NUMBER 3:**

CONTRACTOR NAME: \_\_\_\_\_

CLIENT NAME: \_\_\_\_\_

PHYSICAL STREET ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

PRIMARY CONTACT NAME: \_\_\_\_\_

PRIMARY CONTACT PHONE NUMBER: \_\_\_\_\_

PRIMARY CONTACT EMAIL ADDRESS: \_\_\_\_\_

CONTRACT PERFORMANCE PERIOD: \_\_\_\_\_

LOCATION OF SERVICES: \_\_\_\_\_

BRIEF DESCRIPTION OF SIMILAR COMMODITIES OR SERVICES PROVIDED BY CONTRACTOR TO THIS CLIENT:

**REFERENCE NUMBER 4:**

CONTRACTOR NAME: \_\_\_\_\_

CLIENT NAME: \_\_\_\_\_

PHYSICAL STREET ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

PRIMARY CONTACT NAME: \_\_\_\_\_

PRIMARY CONTACT PHONE NUMBER: \_\_\_\_\_

PRIMARY CONTACT EMAIL ADDRESS: \_\_\_\_\_

CONTRACT PERFORMANCE PERIOD: \_\_\_\_\_

LOCATION OF SERVICES: \_\_\_\_\_

BRIEF DESCRIPTION OF SIMILAR COMMODITIES OR SERVICES PROVIDED BY CONTRACTOR TO THIS CLIENT:

**FORM "4"**  
**ADDENDUM ACKNOWLEDGMENT**

CONTRACTOR MUST INCLUDE THIS FORM FULLY EXECUTED, IN THE PROVIDED FORMAT, WITH RESPONSE TO THIS SOLICITATION. FAILURE TO FULLY EXECUTE AND SUBMIT THIS FORM MAY RESULT IN CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM IF ANY ADDENDUM HAS BEEN PUBLISHED ON THE STATE OF FLORIDA VENDOR BID SYSTEM (VBS).

CONTRACTOR'S FAILURE TO ACKNOWLEDGE BELOW ANY PUBLISHED ADDENDUM MAY RESULT IN THE CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

ADDENDUM NO.: \_\_\_\_\_ DATED: \_\_\_\_\_      ADDENDUM NO.: \_\_\_\_\_ DATED: \_\_\_\_\_

ADDENDUM NO.: \_\_\_\_\_ DATED: \_\_\_\_\_      ADDENDUM NO.: \_\_\_\_\_ DATED: \_\_\_\_\_

CONTRACTOR'S NAME: \_\_\_\_\_

MAILING ADDRESS (PHYSICAL STREET): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TELEPHONE #: \_\_\_\_\_

FAX #: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

*ACKNOWLEDGEMENT: AS THE PERSON AUTHORIZED TO SIGN ON BEHALF OF THE CONTRACTOR, I ACKNOWLEDGE RECEIPT OF THE ISSUED ADDENDUM TO THIS SOLICITATION.*

AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

**FORM "5"**  
**ATTESTATION OF NO CONFLICT**

CONTRACTOR MUST INCLUDE THIS FORM FULLY EXECUTED, IN THE PROVIDED FORMAT, WITH RESPONSE TO THIS SOLICITATION. FAILURE TO FULLY EXECUTE AND SUBMIT THIS FORM MAY RESULT IN CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

ALL CONTRACTOR PERSONNEL, AGENTS, REPRESENTATIVES, SUBCONTRACTORS AND THEIR EMPLOYEES, AND ALL OTHER PERSONS THAT TOOK PART IN THE PROCUREMENT PROCESS ARE REQUIRED TO DISCLOSE IF THEY HAVE ANY CONFLICT OF INTEREST REGARDING SOLICITATION NO. **FDVA-ITB-20-016B**.

CONTRACTOR'S NAME: \_\_\_\_\_

MAILING ADDRESS (PHYSICAL STREET): \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TELEPHONE #: \_\_\_\_\_

FAX #: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

*ACKNOWLEDGMENT: EACH UNDERSIGNED INDIVIDUAL HEREBY ATTESTS THAT THEY TOOK PART IN THE PROCUREMENT PROCESS FOR THE ABOVE SPECIFIED SOLICITATION AND THAT THEY HAVE NO CONFLICT OF INTEREST.*

1. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

2. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

3. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

4. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

5. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

6. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

7. AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

**FORM "6"**  
**DRUG-FREE WORKPLACE CERTIFICATION**

CONTRACTOR MUST INCLUDE THIS FORM FULLY EXECUTED, IN THE PROVIDED FORMAT, WITH RESPONSE TO THIS SOLICITATION. FAILURE TO FULLY EXECUTE AND SUBMIT THIS FORM MAY RESULT IN CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

SECTION 287.087, FLORIDA STATUTES, PROVIDES THAT WHERE IDENTICAL (TIE) RESPONSES ARE RECEIVED, PREFERENCE SHALL BE GIVEN TO A BID RECEIVED FROM A RESPONDENT THAT CERTIFIES IT HAS IMPLEMENTED A DRUG-FREE WORKFORCE PROGRAM. PLEASE REVIEW THE BELOW, SIGN, AND RETURN THIS FORM TO CERTIFY RESPONDENT'S IMPLEMENTATION OF A DRUG-FREE WORKPLACE PROGRAM AS FOLLOWS:

1. PUBLISH A STATEMENT NOTIFYING EMPLOYEES THAT THE UNLAWFUL MANUFACTURE, DISTRIBUTION, DISPENSING, POSSESSION, OR USE OF A CONTROLLED SUBSTANCE IS PROHIBITED IN THE WORKPLACE AND SPECIFYING THE ACTIONS THAT WILL BE TAKEN AGAINST EMPLOYEES FOR VIOLATION OF SUCH PROHIBITION.
2. INFORM EMPLOYEES ABOUT THE DANGERS OF DRUG ABUSE IN THE WORKPLACE, THE COMPANY'S POLICY OF MAINTAINING A DRUG-FREE WORKPLACE, ANY AVAILABLE DRUG COUNSELING, REHABILITATION AND EMPLOYEE ASSISTANCE PROGRAMS AND THE PENALTIES THAT MAY BE IMPOSED UPON EMPLOYEES FOR DRUG ABUSE VIOLATIONS.
3. GIVE EACH EMPLOYEE ENGAGED IN PROVIDING THE GOODS OR SERVICES REQUIRED IN THIS SOLICITATION A COPY OF THE STATEMENT SPECIFIED ABOVE IN SECTION 1.
4. IN THE STATEMENT SPECIFIED ABOVE IN SECTION 1, NOTIFY EMPLOYEE(S) AS A CONDITION OF PROVIDING THE GOODS OR SERVICES REQUIRED IN THIS SOLICITATION, THAT EMPLOYEE(S) WILL ABIDE BY THE TERMS OF THE STATEMENT AND WILL NOTIFY COMPANY OF ANY CONVICTION OF, OR PLEA OF GUILTY OR NOLO CONTENDERE TO, ANY VIOLATION OF CHAPTER 893 OR OF ANY CONTROLLED SUBSTANCE LAW OF THE UNITED STATES AND ANY STATE, FOR A VIOLATION OCCURING IN THE WORKPLACE NO LATER THAN FIVE (5) CALENDAR DAYS AFTER SUCH CONVICTION.
5. IMPOSE A SANCTION ON, OR REQUIRE THE SATISFACTORY PARTICIPATION IN A DRUG ABUSE ASSISTANCE OR REHABILITATION PROGRAM IF SUCH IS AVAILABLE IN THE EMPLOYEE'S COMMUNITY BY ANY EMPLOYEE WHO IS SO CONVICTED.
6. MAKE A GOOD FAITH EFFORT TO CONTINUE TO MAINTAIN A DRUG-FREE WORKPLACE THROUGH IMPLEMENTATION OF A DRUG-FREE WORKPLACE PROGRAM.

*ACKNOWLEDGMENT: AS THE PERSON AUTHORIZED TO SIGN ON BEHALF OF THE CONTRACTOR, I CERTIFY THAT THIS COMPANY FULLY COMPLIES WITH THE ABOVE REQUIREMENTS. I FURTHER UNDERSTAND THAT THE SUBMISSION OF A FALSE CERTIFICATION MAY RESULT IN TERMINATION OF THE AGREEMENT, AND SUBJECT THE CONTRACTOR TO CIVIL PENALTIES, ATTORNEY'S FEE'S AND COSTS, PURSUANT TO FLORIDA LAW.*

CONTRACTOR'S NAME: \_\_\_\_\_

MAILING ADDRESS (PHYSICAL STREET): \_\_\_\_\_

\_\_\_\_\_

TELEPHONE #: \_\_\_\_\_

FAX #: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

AUTHORIZED SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

PRINT AUTHORIZED NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

**FORM "7"**  
**NON-COLLUSION AFFIDAVIT**

CONTRACTOR MUST INCLUDE THIS FORM FULLY EXECUTED, IN THE PROVIDED FORMAT, WITH RESPONSE TO THIS SOLICITATION. FAILURE TO FULLY EXECUTE AND SUBMIT THIS FORM MAY RESULT IN CONTRACTOR BEING CONSIDERED NON-RESPONSIVE.

STATE OF \_\_\_\_\_ COUNTY OF \_\_\_\_\_

CONTRACTOR'S NAME: \_\_\_\_\_

MAILING ADDRESS (PHYSICAL STREET): \_\_\_\_\_

\_\_\_\_\_

I STATE THAT I AM AUTHORIZED TO MAKE THIS AFFIDAVIT ON BEHALF OF THE CONTRACTOR, AND ITS OWNER, DIRECTORS, AND OFFICERS. I AM THE PERSON RESPONSIBLE IN MY FIRM FOR THE PRICE(S) AND THE AMOUNT(S) OF THIS RESPONSE AND THE PREPARATION OF THE RESPONSE TO SOLICITATION NO. **FDVA-ITB-20-016B**. I STATE THAT:

1. THE PRICE(S) AND AMOUNT(S) OF THIS RESPONSE HAVE BEEN ARRIVED AT INDEPENDENTLY AND WITHOUT CONSULTATION, COMMUNICATION OR AGREEMENT WITH ANY OTHER FIRM OR PERSON.
2. NEITHER THE PRICE(S) NOR THE AMOUNT(S) OF THIS RESPONSE, AND NEITHER THE APPROXIMATE PRICE(S) NOR APPROXIMATE AMOUNT(S) OF THIS RESPONSE, HAVE BEEN DISCLOSED TO ANY OTHER FIRM OR PERSON AND THEY WILL NOT BE DISCLOSED BEFORE RESPONSE OPENING.
3. NO ATTEMPT HAS BEEN MADE OR WILL BE MADE TO INDUCE ANY OTHER FIRM OR PERSON TO REFRAIN FROM SUBMITTING A RESPONSE FOR THIS SOLICITATION, OR TO SUBMIT A PRICE(S) HIGHER THAT THE PRICE(S) IN THIS RESPONSE, OR TO SUBMIT ANY INTENTIONALLY HIGH OR NONCOMPETITIVE PRICE(S) OR OTHER FORM OF COMPLEMENTARY RESPONSE.
4. THE RESPONSE IS MADE IN GOOD FAITH AND NOT PURSUANT TO ANY AGREEMENT OR DISCUSSION WITH, OR INDUCEMENT FROM, ANY OTHER FIRM OR PERSON TO SUBMIT A COMPLEMENTARY OR OTHER NONCOMPETITIVE RESPONSE.
5. THE NAMED CONTRACTOR, ITS AFFILIATES, SUBSIDIARIES, OFFICERS, DIRECTOR, AND EMPLOYEES ARE NOT CURRENTLY UNDER INVESTIGATION, BY ANY GOVERNMENTAL AGENCY AND HAVE NOT IN THE LAST THREE YEARS BEEN CONVICTED OR FOUND LIABLE FOR ANY ACT PROHIBITED BY STATE OR FEDERAL LAW IN ANY JURISDICTION, INVOLVING CONSPIRACY OR COLLUSION WITH RESPECT TO SUBMITTING A RESPONSE ON ANY PUBLIC CONTRACT.

*I STATE THAT I, AND THE NAMED CONTRACTOR, UNDERSTAND AND ACKNOWLEDGE THAT THE ABOVE REPRESENTATIONS ARE MATERIAL AND IMPORTANT, AND WILL BE RELIED ON BY THE STATE OF FLORIDA FOR WHICH THIS RESPONSE IS SUBMITTED. I UNDERSTAND AND MY FIRM UNDERSTANDS ANY MISSTATEMENT IN THIS AFFIDAVIT IS AND SHALL BE TREATED AS FRAUDULENT CONCEALMENT FROM THE STATE OF FLORIDA OF THE TRUE FACTS RELATING TO THE SUBMISSION OF RESPONSE FOR THE AGREEMENT.*

\_\_\_\_\_  
AUTHORIZED SIGNATURE

\_\_\_\_\_  
PRINTED NAME AND TITLE

SWORN TO AND SUBSCRIBED BEFORE ME ON THIS \_\_\_\_\_ DAY OF \_\_\_\_\_, 2020.

\_\_\_\_\_  
SIGNATURE OF NOTARY

STATE OF \_\_\_\_\_

PRINT, TYPE OR STAMP COMMISSIONED NAME OF NOTARY PUBLIC \_\_\_\_\_

PERSONALLY KNOWN OR PRODUCED IDENTIFICATION: \_\_\_\_\_

TYPE OF IDENTIFICATION PRODUCED: \_\_\_\_\_

**FORM "8"**  
**PERFORMANCE AND PAYMENT BOND ("DRAFT")**

**PERFORMANCE AND PAYMENT BOND**

(Statutory Bond for Performance and Payment pursuant to Section 255.05, Florida Statutes)

**BOND NO. (Enter Bond Number)**

**BY THIS BOND**, We, \_\_\_\_\_, a state of \_\_\_\_\_ Corporation, with a principal address of \_\_\_\_\_ (Telephone No. \_\_\_\_\_) as Principal and \_\_\_\_\_, a state of \_\_\_\_\_ corporation, as Surety, are bound to the **State of Florida**, Owner, and **Department of Veterans' Affairs** ("FDVA"), as State of Florida's Contracting Public Entity, with an address at 11351 Ulmerton Road, Suite 311-K, Largo, Florida 33778-1630, in the sum of **\$TBD**, for payment of which we bind ourselves, our heirs, personal representatives, successors, and assigns, jointly and severally in connection with the performance of the Contract No.: FDVA-ITB-20-016B, dated \_\_\_\_\_, 2020, and titled "**Fluid Cooler Replacement**" in order to furnish all labor, services (including design-build), equipment, tools, materials, parts, and supplies necessary for the Lopez Automatic Transfer Switch to achieve the requirements of Agreement at the following service location:

**Baldomero Lopez State Veterans' Nursing Home  
6919 Parkway Blvd  
Land O' Lakes Florida 34639**

**THE CONDITION OF THIS BOND** is that if Principal:

1. Performs the Contract No. FDVA-ITB-20-016B dated \_\_\_\_\_, 2020, including amendments thereto, if any, between Principal and Owner for the installation of "**Fluid Cooler Replacement**" as described above, the contract being made a part of this bond by reference, at the times and in the manner prescribed in the contract; and
2. Promptly makes payments to all claimants, as defined in Section 255.05(1), Florida Statutes, supplying Principal with labor, materials, or supplies, used directly or indirectly by Principal in the prosecution of the work provided for in the contract; and
3. Pays Owner any and all losses, damages, expenses, costs, and attorney's fees, including appellate proceedings, that Owner sustains because of a default by Principal under the contract; and
4. Performs the guarantee of all work and materials furnished under the contract for the time specified in the contract, then this bond is void; otherwise it remains in full force.

Any action instituted by a claimant under this bond for payment must be in accordance with the notice and time limitation provisions in Section 255.05(2) and (10), Florida Statutes. This instrument shall be construed in all respects as a statutory law bond of the State of Florida, pursuant to Section 255.05, Florida Statutes. Any changes in or under the contract documents and compliance or noncompliance with any formalities connected with the contract or the changes does not affect Surety's obligation under this bond.

**BOND NO.** \_\_\_\_\_

**IN WITNESS WHEREOF**, the above parties have executed this instrument this \_\_\_\_\_ day of \_\_\_\_\_,

2020, the name and corporate seal of each corporate party being hereto affixed and these premises duly signed by its undersigned representative, pursuant to authority of its governing body.

**PRINCIPAL:** \_\_\_\_\_

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Corporate / Print Name and Title

**ATTEST:**

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Corporate Secretary

**WITNESSES:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**SURETY:** \_\_\_\_\_

\_\_\_\_\_  
Attorney-in-Fact (Signature)

\_\_\_\_\_  
Print Name

**Name and Address of Registered Agent:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Telephone No: \_\_\_\_\_

**STATE OF** \_\_\_\_\_ ; **COUNTY OF** \_\_\_\_\_

Before me this day personally appeared \_\_\_\_\_ who, being duly sworn, deposes and says that he/she is the Attorney-in-Fact for the \_\_\_\_\_ (corporate surety) and that this person has been authorized by \_\_\_\_\_ (corporate surety) to execute the foregoing bond.

Signature of Affiant: \_\_\_\_\_

Sworn to / affirmed and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, 2020, by

\_\_\_\_\_, who is personally known to me, or who has produced

\_\_\_\_\_ as identification.

\_\_\_\_\_  
**NOTARY PUBLIC, STATE OF** \_\_\_\_\_

Print Name: \_\_\_\_\_

(Seal)

Commission No. \_\_\_\_\_

Commission Expires: \_\_\_\_\_