NSWC
Dahlgren
Facilities Engineering Division

PERFORMANCE WORK STATEMENT

Building 1400
B1400 Replace South Side HVAC Equipment

Design Manager: John Lee
10/28/2025

Project Summary

Building 1400 is a metal type building that is separated North and South by a breeze way. This project will only pertain to the South Side of Building 1400. There are four separate rooms that will require replacing the Heat Pump(s), split system and modifying or replacing the duct work to achieve the design intent. The addition of a ceiling mounted DOAS system located within room 134 and feeding rooms 130,131,132,133 and room 134. The new systems shall include all control work to allow the Government to remotely view and Enable/Disable equipment as needed. Add a graphical interface to the Base wide Network. All new lab systems must be split system, direct expansion type heat pump(s) with electrical back up heat.

Existing System Room 130
Trane - 2TWB3030A1000AA
Serial – 5412PJE2F
R-22
208/230v 1 PH

Existing System Room 131
Trane - 2TWB3030A1000AA
Serial – 6472WGN4F
R-22
208/230v 1 PH

Existing System Room 132
Trane - 2TWB3030A1000AA
Serial – 6472WDP4F
R-22
208/230v 1 PH

Existing System Room 134
LIEBERT – MMD96E-COELAS80
Serial – 0637N135107
R-22
208v 3 PH
15 KW Reheat

General Requirements:

- All work to comply in full accordance with the US Army Corps of Engineers Safety and Health Requirements Manual EM 385-1-1.
- Contractor must clean up job site daily and immediately upon completion, haul away all debris; perform complete clean up to restore to a condition comparable to general condition of site prior to construction beginning.
- Work to be performed during normal working hours.
- Prefabricate work material and control packages to the greatest extent practical to minimize field work and impact to occupants.
- Controls shall be Schneider Electric (BacNET MSTP) for Niagra Framework for Facility Related Control Systems (FRCS) in accordance with Justification & Approval (J&A) No. N40080-24-J&A-004.
- Sequence work and coordinate with building occupants.
- Existing duct penetrations/opening between rooms 134,130,131 and 132 that will no longer be used, must be sealed using sheet rock, sheet rock tape and sheet rock joint compound. Rough finish is acceptable above the ceiling. Full finish to include matching the paint will be required to all affected areas below the ceiling.
- The contractor shall be responsible for properly sizing the new duct to meet the new air system's requirements. New supply and return diffuser counts and locations shall match the existing diffuser(s) counts and locations.
- The contractor shall install manual volume dampers inside the supply air take off. The contractor shall provide a Work Plan to the Government atleast two weeks prio to the start of the project. The work plan shall be a day to day account showing what activities will be performed and how the activity will be performed.

Non-Destructive Site Investigation:

Perform appropriate non-destructive field investigations necessary to develop shop drawings and identify interruptions to the building occupants, including, but not necessarily limited to:

1. Validate quantity and locations of the existing units in the building.
2. Validate the existing unit capacity and physical dimensions and loading
3. Confirm existing capacity to include any electric heating banks
4. Validate electrical circuits to confirm electrical characteristics and connection points. Identify equipment/lights that will be affected with each lock-out/tag-out procedure.
5. Validate size, capacity and electrical characteristics of existing indoor and outdoor unit(s)
6. Determine applicable painting/patching and relocation of equipment and cubicles during/after construction.
7. Validate Base Wide DDC network termination location
8. Reclaim refrigerant and provide required refrigerant recover documentation to the Government (ODS) Ozone Depleting Substance. See Attached ODS Form

Heat Pump(s) Replacement: Mechanical

- Confirm with the Government, all final locations of indoor and outdoor units
- Replace existing refrigerant lines with new copper lines. Vapor line is to be insulated using ½"(Wall Thickness) closed cell type insulation.
- Install new thermostats – one each system- Use existing location(s)
- Install new DDC temperature and humidity sensors in Labs 130,131,132 and 134, to be used as a monitoring device only and not control.
- Install duct work as necessary to include flexible supply lines.
- The Duct shall be insulated using closed cell type insulation (Bubble Wrap) The R- Value shall not be less than R-8
- Reuse existing refrigerant piping route. Currently the refrigerant lines are routed through rooms, 131 and 130. The refrigerant lines come down the wall in room 130 and terminate out the exterior wall. The contractor shall remove the existing sheet rock between the wall joists to run the new refrigerant lines. The contractor shall also replace the sheet rock and finish the sheet rock to include matching the wall paint currently in room 130 after pressure testing and prior to final acceptance.
- Leak test using nitrogen - pressurizing system to 450PSI for one hour
- Vacuum line set down to 300 microns – hold for one hour
- Install condensate traps on the systems AHU and the emergency drain pan that have an integral high level cut out. If the drain is blocked the switch shall prevent the system from operating and send a signal to the BMS front end indicating a condensate blockage. This point shall be on the graphic. The high condensate alarms for the primary and emergency drain pan drains shall be a manual reset type alarm and shall not be capable of reset from a remote location VIA DDC
- Install emergency Drain Pan under each unit. Each emergency drain pan shall have a condensate overflow switch. The emergency drain pan switch shall prevent the unit from operating when ½" or less of water is in the emergency drain pan. The emergency drain pan shall not be piped to the outside. No drain required. The high condensate shut down shall be hardwired. The emergency drain pan shall have a DDC point that will send an alarm to the front end during a condensate level alarm. The alarm must be cleared using a local manual reset.
- Install the new outdoor unit(s) in the existing location – Contractor to determine if the area is large enough for the new proposed Outdoor units. If the area is not adequate, the contractor shall pour concrete at the same level as the existing pad. Concrete to be 4" in depth and be reinforced using wire mesh or rebar.
- The contractor shall be responsible for properly sizing the new duct to meet the new air system's requirements. See attached diffuser count and layout.
- The contractor shall install manual volume dampers at each supply outlet. Install volume dampers at the supply take off. The unit(s) return shall be plenum return. Room 132 shall have a hard ducted return. Rooms 130,131 and 134 shall have plenum returns. Install egg crate type returns(2X2) in the lab space. See drawing.

Heat Pump Replacement: Electrical

- Make all circuits safe. Lock out tag out each circuit
- Install properly sized breaker at Panel board per the manufacturer requirements
- Install New NEMA 1 electrical disconnects (Indoor Only). The disconnects must have the ability to be locked and shall be located within arms reach of each indoor and outdoor unit.
- Replace and properly size the outdoor disconnects using NEMA 3R type
- Supply all necessary wire to tie in all electrical from the Panel Board to disconnect(s) and to the load(s) Both indoor and outdoor loads.

Room 132 Installation

Room 132 is a secure room that currently has all ducting completed within the space. The new system will be located in the ceiling of room 134 directly outside room 132.(See Drawing)

The contractor shall connect the new system ducting to the existing duct to include any and all needed modifications. Insulate the duct using closed cell type insulation(Bubble Wrap) or equivalent. Insulation value shall not be less than R-8. No Duct or work other than the installation of the new thermostat(s)(DDC and Local) shall take place within room 132. The contractor shall request access to room 132 at least one week prior to scheduling the installation of the thermostat and DDC humidity and temperature sensor.

The new system shall be a ceiling hung split system heat pump with electrical backup heat, and variable speed indoor fan. The emergency drain pan will not be piped to a drain. The water sensor shall prevent the unit from operating if water is sensed in the emergency drain pan. The unit primary drain shall also have an integral high/blocked drain cutout. Both water/high level shut offs (Primary and secondary drain)shall be alarmable and shall send an alarm to the Base DDC work station using the existing JACE MSTP port. The high level alarm/shut down shall be hard wired in a lockout safety circuit that prevents the unit from operating if water or high level water is detected. The reset shall be a manual reset that can only be cleared when the high water/water detection condition has been cleared. The naming and addressing of the BACNET devices shall be provided after award of the contract. The Jace location will be identified during the pre-bid walk through

Demo Room 132 System

- Remove the existing Air handing unit and local electrical disconnect. (Located in room 134)
- Remove existing sensor from within room 132.
- No duct within room 132 shall be demolished. (This duct has been replaced as part of an earlier project and shall be reused) All duct attached to the existing equipment shall be removed.
- Existing Outside air opening for this system shall be sealed and insulated from the inside and covered using sheet metal. The outdoor louver will remain in place. The insulation shall be R38. The sheet metal can be 26 gauge or greater.

Room 132 Mechanical Installation

- Mount new AHU in ceiling of room 134
- Install Emergency drain pan with water sensing cutoff
- Tie new system into the existing duct work both supply and return.
- Insulate duct using closed cell type insulation (Bubble Wrap) R-8 Minimum Insulating value.
- Route new copper line set from the indoor unit to the outdoor unit location. Vapor line shall be insulated per the manufacturer requirements.
- The copper lineset shall be tested at 450# of nitrogen for one hour - Government must witness
- Vacuum lineset down to 300 microns and let stand for one hour – Government must witness
- Perform a manufacturer startup and provide the startup documents to the Government Construction manager no less than 3 days after startup – Government to be invited to witness startup – Provide a minimum of one weeks notice to the Government of intended startup date(s)
- Mark/Tag the indoor and outdoor units indicating room # and address#. Marks are to be permanent type marker located inside the electrical disconnect. Tags are to be plastic or similar and must be UV rated for outdoor use. IE:Room 132 Address XX

Room 132 Electrical Demolition

- Make all electrical circuits safe prior to the removal of any equipment. Lock out tag out is required at the Panel board. Panel Board located in room 130 Panel Board P3A1.
- Remove wiring from the equipment to the unit (Indoor/outdoor)
- Remove wiring from panel board to load as required/needed for new load – If the new equipment does not exceed the existing wire rating, the existing wire may be reused.
- Remove and dispose of the existing disconnects – both indoors and outdoors

Room 132 Electrical Installation

- Install new circuit breakers to match the equipment requirements
- Install new copper wiring as need from the panel board to the disconnect(s) – Indoor and outdoor
- Install a new NEMA3R outdoor disconnect All outdoor disconnects shall have identifying panel board and breaker numbers written in permanent marker inside the disconnect. IE: Room# XXX Panel Board XXX Breaker XX
- Install new Indoor disconnect. An on board equipment circuit breaker will not substitute or be considered an alternative to the required remote disconnect mentioned in the SOW. The indoor disconnect shall be a NEMA 1 type disconnect rated at the equipment's requirements and shall be mounted at a maximum at arm's length from the unit.

Room 132 DDC Demolition

- Remove existing thermostat and wiring.

Room 131 General Notes

Install the indoor unit above the ceiling within room 131. Mount the unit approximately 8 feet inside the door and position the indoor unit to be a horizontal left discharge. Final location to be coordinated with the Government prior to demolition of the existing system. All duct and unit systems components other than the outdoor unit shall be located within room 131.

The thermostats location shall be reused.

Room 131 Mechanical Demolition

- Remove existing fan coil – Located in room 134 ceiling
- Remove Outdoor unit – Reclaim refrigerant and provide required refrigerant recover documentation(The Government will provide the required recovery documents- Contractor to properly complete the documents)
- Remove ALL ductwork from existing system and room – Dispose of properly
- Remove existing thermostat
- Remove all flexible ducting and ceiling diffusers - Diffusers to be given back to the Government. New diffusers to be installed. Dispose of all existing ducting
- Remove and dispose of the existing refrigerant lineset and interconnecting low voltage wiring.
- Existing Outside air opening for this system shall be sealed and insulated from the inside and covered using sheet metal. The outdoor louver will remain in place. The insulation shall be R38. The sheet metal can be 26 gauge or greater.

Room 131 Mechanical Installation

- Mount new AHU in ceiling of room 131 – Horizontal Left Discharge
- Install Emergency drain pan with water sensing cutoff, Manul Reset type
- Install Condensate trap with clogged drain shut off. Manual reset type
- Insulate duct using closed cell type insulation (Bubble Wrap) R-8 Minimum Insulating value.
- Route new copper line set from the indoor unit to the outdoor unit location.
- The copper lineset shall be tested at 450# of nitrogen for one hour - Government must witness
- Vacuum lineset down to 300 microns and let stand for one hour – Government must witness
- Install new thermostat in the existing thermostat location
- Perform a manufacturer startup and provide the startup documents to the Government Construction manager no less than 3 days after startup – Government to be invited to witness startup – Provide a minimum of one weeks notice to the Government of intended startup date(s)
- Place Hard tags and permanent markings on indoor and outdoor unit identifying the room # the unit(s) serve along with the Name IE: Room 131 Address XXX

Room 131 DDC Demolition

- Remove existing thermostat and wiring.

Room 131 Electrical Demolition

- Make all electrical circuits safe prior to the removal of any equipment. Lock out tag out is required at the Panel board. Panel Board located in room 130 Panel Board P3A1.
- Remove wiring from the equipment to the unit (Indoor/outdoor)
- Remove wiring from panel board to load as required/needed for new load – If the new equipment does not exceed the existing wire rating, the existing wire may be reused.
- Remove and dispose of the existing disconnects – both indoors and outdoors

Room 131 Electrical Installation

- Install new circuit breakers to match the equipment requirements
- Install new copper wiring as need from the panel board to the disconnect(s) – Indoor and outdoor
- Install a new NEMA3R outdoor disconnect All outdoor disconnects shall have identifying panel board and breaker numbers written in permanent marker inside the disconnect.
- Install new Indoor disconnect. An on board equipment circuit breaker will not substitute or be considered an alternative to the required remote disconnect mentioned in the SOW. The indoor disconnect shall be a NEMA 1 type disconnect rated at the equipment's requirements and shall be mounted at a maximum at arms length from the unit.

Room 130 General Notes

Room 130 shall have the indoor unit mounted above the ceiling within room 130. Mount the unit approximately 8 feet inside the door and position the indoor unit to be a horizontal left discharge. Final location to be coordinated with the Government prior to demolition of the existing system. All duct and unit systems components other than the outdoor unit shall be located within room 130. The thermostats location shall be reused.

Room 130 Mechanical Demolition

- Remove existing fan coil – Located in room 134 ceiling
- Remove Outdoor unit – Reclaim refrigerant and provide required refrigerant recover documentation(The Government will provide the required recovery documents- Contractor to properly complete the documents)
- Remove ALL ductwork from existing system and room – Dispose of properly
- Remove existing thermostat
- Remove all flexible ducting and ceiling diffusers - Diffusers to be given back to the Government. New diffusers to be installed. Dispose of all existing ducting
- Remove and dispose of the existing refrigerant lineset and interconnecting low voltage wiring.
- Existing Outside air opening for this system shall be sealed and insulated from the inside and covered using sheet metal. The outdoor louver will remain in place. The insulation shall be R38. The sheet metal can be 26 gauge or greater. The OA opening is located above the south side exit door directly adjacent to the existing AHU.

Room 130 Mechanical Installation

- Mount new AHU in ceiling of room 130 – Horizontal Left Discharge
- Install Emergency drain pan with water sensing cutoff. Manual Reset Type
- Install Condensate trap with clogged drain shut off. Manual Reset Type
- Insulate duct using closed cell type insulation (Bubble Wrap) R-8 Minimum Insulating value.
- Route new copper line set from the indoor unit to the outdoor unit location.
- The copper lineset shall be tested at 450# of nitrogen for one hour - Government must witness
- Vacuum lineset down to 300 microns and let stand for one hour – Government must witness
- Install new thermostat in the existing thermostat location
- Perform a manufacturer startup and provide the startup documents to the Government Construction manager no less than 3 days after startup – Government to be invited to witness startup – Provide a minimum of one weeks notice to the Government of intended startup date(s)
- Place Hard tags and permanent markings on indoor and outdoor unit identifying the room # the unit(s) serve along with the Name IE:Room 130 Address XXX

Room 130 DDC Demolition

- Remove existing thermostat and wiring.

Room 130 Electrical Demolition

- Make all electrical circuits safe prior to the removal of any equipment. Lock out tag out is required at the Panel board. Panel Board located in room 130 Panel Board P3A1.
- Remove wiring from the equipment to the unit (Indoor/outdoor)
- Remove wiring from panel board to load as required/needed for new load – If the new equipment does not exceed the existing wire rating, the existing wire may be reused.
- Remove and dispose of the existing disconnects – both indoors and outdoors

Room 130 Electrical Installation

- Install new circuit breakers to match the equipment requirements
- Install new copper wiring as need from the panel board to the disconnect(s) – Indoor and outdoor
- Install a new NEMA3R outdoor disconnect All outdoor disconnects shall have identifying panel board and breaker numbers written in permanent marker inside the disconnect.
- Install new Indoor disconnect. An on board equipment circuit breaker will not substitute or be considered an alternative to the required remote disconnect mentioned in the SOW. The indoor disconnect shall be a NEMA 1 type disconnect rated at the equipment's requirements and shall be mounted at a maximum at arms length from the unit.

Room 134 General Notes

Room 134 is a large room whereas the indoor unit is located in ceiling above room 136(Janitorial Closet). As part of this project the unit will be removed from its current location and shall have the indoor unit mounted above the ceiling at the indicated location. The Unit shall be horizontal right or in a position that does not obstruct manufacturer minimum spacing requirements. This unit shall serve all of room 134 and all areas that are currently serviced by the existing system, reuse the existing duct to the extent possible. All ducting required to connect the new unit to the existing duct shall be the contractors responsibility. Mount the unit approximately 8 feet inside the door and position the indoor unit to be a horizontal left discharge. Final location to be coordinated with the Government prior to demolition of the existing system. All duct and unit systems components other than the outdoor unit shall be located within room 134. The thermostats location shall be reused.

Room 134 Mechanical Demolition

- Remove existing Air Handler – Located in room 136 ceiling
- Remove Outdoor unit(located on west side of B1400 and room 134)
- Reclaim refrigerant and provide required refrigerant recover documentation(The Government will provide the required recovery documents- Contractor to properly complete the documents)
- Remove and replace ceiling diffusers and ducting as needed. Reuse all diffusers and duct to the extent possible to adapt the new system to the existing duct.
- Remove existing thermostat
- Remove and dispose of the existing refrigerant lineset and interconnecting low voltage wiring.
- Remove the outdoor unit.

Room 134 Mechanical Installation

- Mount new AHU in ceiling of room 134 – Horizontal right Discharge. Install new Air Handling unit in the new specified location(Above and between Room 133 and 134. Final location to be coordinated with the Government.
- Install Emergency drain pan with water sensing cutoff. Manual Reset Type
- Install Condensate trap with clogged drain shut off. Manual Reset Type
- Insulate duct using closed cell type insulation (Bubble Wrap) R-8 Minimum Insulating value.
- Route new copper line set from the indoor unit to the outdoor unit location.
- The copper lineset shall be tested at 450# of nitrogen for one hour - Government must witness
- Vacuum lineset down to 300 microns and let stand for one hour – Government must witness
- Install new thermostat in the existing thermostat location
- Perform a manufacturer startup and provide the startup documents to the Government Construction manager no less than 3 days after startup – Government to be invited to witness startup – Provide a minimum of one weeks notice to the Government of intended startup date(s)
- Place Hard tags and permanent markings on indoor and outdoor unit identifying the room # the unit(s) serve along with the Name IE:Room 130 Address XXX
- The existing outside air opening shall be enlarged and reused for the new DOAS unit. The contractor shall use the appropriate outdoor use sealant to seal around the new louvers.

Room 134 DDC Demolition

- Remove existing thermostat and thermostat wiring

Room 134 Electrical Demolition

- Make all electrical circuits safe prior to the removal of any equipment. Lock out tag out is required at the Panel board. Panel Board located in room 130 Panel Board P3A1.
- Remove wiring from the equipment to the unit (Indoor/outdoor)
- Remove wiring from panel board to load as required/needed for new load – If the new equipment does not exceed the existing wire rating, the existing wire may be reused.
- Remove and dispose of the existing disconnects – both indoors and outdoors

Room 134 Electrical Installation

- Install new circuit breakers to match the equipment requirements
- Install new copper wiring as need from the panel board to the disconnect(s) – Indoor and outdoor
- Install a new NEMA3R outdoor disconnect All outdoor disconnects shall have identifying panel board and breaker numbers written in permanent marker inside the disconnect.
- Install new Indoor disconnect. An on board equipment circuit breaker will not substitute or be considered an alternative to the required remote disconnect mentioned in the SOW. The indoor disconnect shall be a NEMA 1 type disconnect rated at the equipment's requirements and shall be mounted at a maximum at arms length from the unit.

Rooms 130,131,132 and 134 - Direct Digital Control Installation Requirements

Naming and addressing shall be provided to the contractor after award.
Bacnet MSTP protocol shall be used.
Install new DDC temperature and humidity sensors in Labs 130,131,132 and 134
All Bacnet points shall be available at the DDC front end – Located in B182
Provide new graphics at B182 DDC front end. (See Graphic details)
Provide a commissioning plan to the Government no less than 30 days after award. The commissioning plan shall include test procedures that will be used to verify proper operation of the systems. No third party commissioning agents shall be required.
Perform Point to point verification and provide the documents to the Government.
Perform sequence operational test. (Pre – Commissioning)
The contractor shall trend the required points for two weeks prior to requesting Government witnessed commissioning. All trends MUST show the system is operating properly before requesting Government witnessing.

Required DDC Points to be Installed for Graphics – For ALL New Systems

Dahlgren Base currently has a requirement for any controls external of the equipment must be Snyder Controls. Internal (Self Contained within the unit(s) equipment controls, shall be BACNET MSTP but are not required to be Snyder Controls. Route new communication wiring(1.5 Pair) from each device(AHU/OD unit as required) back to the JACE Panel.

- Discharge Temperature – Indoor supply Air
- Space Temperature (Alarm low 65 Deg F/ High 77 Deg_ adjustable)
- Space Humidity (Alarm low 35% _High 65%_ adjustable)
- Fan Status and Command
- All Alarms internal and external to include condensate alarms
- Address of Equipment and location – Address/Baud Rate and naming to be provided after award
- Provide a Commissioning Plan and Point To Point Verification documents

Dedicated Outdoor Air System (DOAS) Located in Room 134

Ceiling mount the new DOAS system in room 134. The new DOAS system will introduce fresh conditioned air into rooms; 130,131,132,133 and room 134. The unit shall be ducted to labs 130 and 131 separately using hard pipe and no more than eight feet of flexible duct. The DOAS shall terminate in the lab space plenum and not tied directly into the return of the AHU(S).

The DOAS main duct shall be constructed of two main ducts. One will supply labs 130 and 131and 132 the other main will pressurize the plenum in room 134 and will not be ducted directly into the AHU in room 134. Lab 132 shall have the DOAS supply line terminate into the return of the unit for Lab 132. The outdoor air damper shall be located at the buildings opening and not at the unit. The outdoor air damper shall have an end switch that will not allow the unit to operate unless the damper is open greater than 95%. This end switch shall be hard wired in series with the safety circuit and will inhibit the operation of the fan motor until the damper has proven to be open greater than 95%. The end switch shall also report its position to the DDC for remote viewing. Existing outside air opening of the unit in RM 134 shall be reused and enlarged as necessary to accommodate the required opening to satisfy the new DOAS unit inlet air requirements.

All duct shall be insulated using closed cell type insulation. The system shall be direct expansion heat pump with electric heat and reheat. The DOAS shall be capable of dehumidifying, cooling, heating and reheating for dehumidification. The DOAS heat pump shall be capable of operating at low ambient outdoor temperatures. The DOAS system shall use BACNET MSTP to communicate with the base DDC network. The DOAS shall also have an interface with a display indicating the dynamic discharge temp and set point. Locate interface outside room 133 five feet above the finished floor. The interface shall be capable of viewing all operational input and outputs for the DOAS. IE: discharge temp, DX status, heating disposition, Humidity and temperature set points and dynamic temperature and humidity values as well as the systems Enable/Disable disposition. The primary control will come from the remote capability, but the local interface shall have the ability to control the DOAS locally if needed. All set points shall be adjustable by the local interface or remotely. The local interface shall have the ability to control the DOAS but

will be locked out to the end user unless unlocked by the Base wide DDC system or on a loss of communication to the base DDC system.
The DOAS system shall be air balanced to assure each supply outlet is meeting the minimum required amount of air.

DOAS Sequence Of Operation: The DOAS shall be indexed to occupied status by the DDC system based upon the scheduled (adjustable) optimum start/stop period. Occupied hours shall be initially set from 0600-1700 hours, Monday to Friday. Once indexed, the OA Damper shall be opened. Once the damper is proven fully open through the end switch, the fan is energized. If supply fan does not prove energized after 90 seconds (adj), an alarm shall be sent to the BAS and the OAD will be commanded off. The unit alarm shall be a manual (Digital) reset alarm through the DDC

The unit shall be indexed to cooling and heating to maintain setpoint (70 F adj) as sensed by the plenum air sensor. A deadband shall be used to switch the unit between modes (+/- 3F adj of setpoint). If plenum sensor setpoint is +/- 5 F (adj) from setpoint for 30 minutes (adj), an alarm shall be sent to the BAS.

Upon an increase in discharge air humidity above the setpoint (55% adj) as sensed by the plenum humidity sensor, the unit shall be indexed to 100% cooling. The electric reheat coil shall be energized and modulated to maintain discharge temperature setpoint. Upon a decrease in plenum humidity 5% below setpoint (adj), the electric reheat coil shall be disabled and the unit shall return to typical plenum temperature control. If discharge humidity exceeds 70 % RH (adj) for more than 5 minutes (adj), an alarm shall be sent to the BAS.

During the unoccupied time period, the fan shall be off. The OA Damper shall be closed.

The unit shall alarm if the discharge temperature deviates from set point by more than 5 deg f for 30 minutes

When condensate pan switch is activated the unit shall be deenergized, OA damper and fan shall be commanded closed/off. An alarm shall be sent to the BAS.

Basis of Design for DOAS Unit

Indoor Unit – Trane – TPEFYP048OA140
Outdoor unit – Trane – TUHYE0723AN41AN

DOAS CFM Requirements

Lab 130 Plenum – 75 CFM
Lab 131 Plenum – 75 CFM
Lab 132 Duct into Unit Return Ducting – 75 CFM
Lab 134 Plenum- 375 CFM

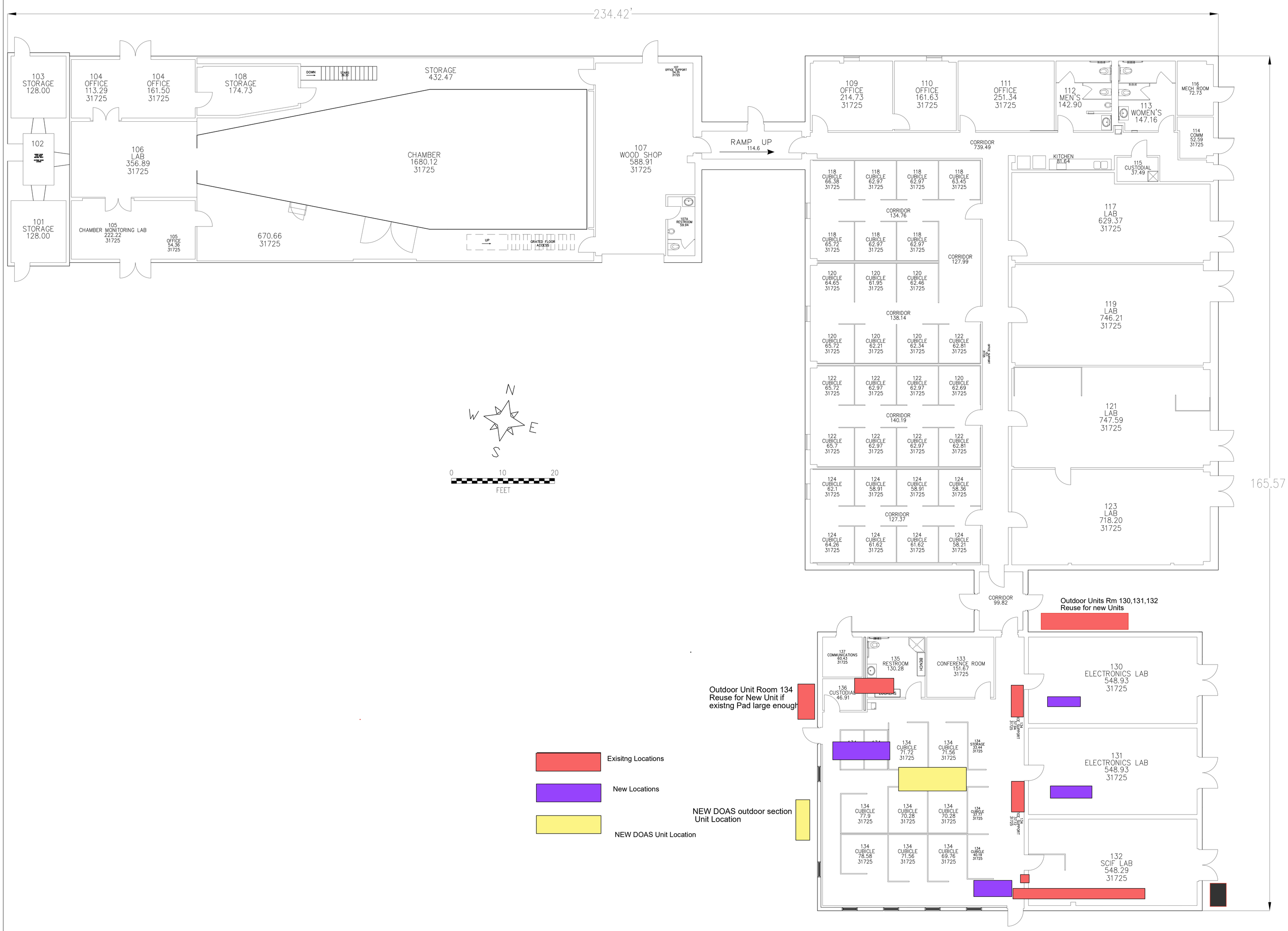
Training

The Contractor shall provide 4 hours of on sight training. The contractor shall provide at least two weeks notice to the Government prior to scheduling training. Startup of the equipment will NOT constitute training.

Required Submittals:

Provide the following submittals for approval:

- Project Schedule
- Indoor Units – Split Systems and DOAS
- Outdoor Units - Split Systems and DOAS
- Controls & Controllers
- Communications Cable
- Sequence of Operation
- Points List
- Commissioning Plan
- System Electrical Disconnects
- (As Builts & O&M's for equipment and DDC, Training)
- Work Plan



Naval Support Activity South Potomac Dahlgren

Building 1400 First Floor

NFA100000599907 SPECIAL EFFECTS TEST FAC.

Naval District Washington

NAVFAC

Each Space Identified With:

Room Number
Space Description
Net Sq Feet
Category Code

SUBMISSIONS/REVISIONS

NO.	DATE	ACTION/REMARKS

Drawing Creation Date: May 2017

Job Name:
System Reference: Date:

GENERAL FEATURES

- Ducted fan coil for 100% outside air applications
- Discharge air temperature control
- Compatibale with Y and R2-Series outdoor units
- Can be used in conjunction with standard indoor units
- Three modes of operation: cooling, heating, and fan only
- Three fan speed settings
- Dual set point functionality*
- Built-in condensate lift; lifts to 27-9/16” (700 mm)

*Requires TAR-30MAOA controller

ACCESSORIES

☐ CN24 Relay Kit (CN24RELAY-KIT-CM3)
☐ Filter Box, includes 2" MERV 13 filter (FBHO2-3)
☐ MA Remote Controller (TAR-30MAOA)

NOTES

*1. Capacity indicates the maximum value at operation under the following condition.
Cooling: Indoor 91°F (32.7°C)DB/82°F (27.8°C)WB, Outdoor 91°F (32.7°C)DB.
The set temperature of the remote controller is 63°F (17.2°C).
Heating: Indoor 32°F (0°C)DB/27°F (-2.9°C)WB,
Outdoor 32°F (0°C)DB/27°F (-2.9°C)WB.
The set temperature of the remote controller is 77°F (25°C).

*2. Thermo-off (FAN-mode) automatically starts if the outdoor temperature is lower than 63°F (17.2°C)D.B. The fan speed automaticall runs at a very low speed if the outdoor temperature is greater than 109°F (42.8°C)D.B.

*3. Thermo-off (FAN-mode) automatically starts if the outdoor temperature is higher than 59°F (15.0°C)D.B.

*4. If the airflow rate is over the usable range, dew drops can be caused from the air outlet and the air flow rate is changed automatically because of the output down by the fan motor control. If the air flow rate is less than the usable range, condensation from the unit surface may occur.

- The maximum connectable indoor units to 1 outdoor unit are 110% (100% in case of heating below 23°F (-5°C)).
- When fresh air intake type indoor units connect to an outdoor unit together with other types of indoor unit, the total capacity of fresh air intake TYPE indoor units needs to be 30% or less of the connected outdoor unit capacity.
- Un-conditioned outdoor air such as humid air or cold air blows to the indoor during thermo off operation.
  Please be careful when positioning indoor unit air OUTLET GRILLES, IE take the necessary precautions for cold air, and also insulate rooms for dew condensation prevention as required.
- Fresh air intake type indoor units cannot be connected to TUMY and cannot be connected to an outdoor unit together with TWFY series.
- See data book and technical service manual for more details and system restrictions.

**If equipment is being used in a seacoast application, a coil coating to protect against saltwater corrosion is recommended

SPECIFICATIONS

Capacity *1		
Cooling	Btu/h	48,000
Heating	Btu/h	28,000

Temperature Range	
Cooling *2	63~118°F D.B. (17.2~47.7°C D.B.)
Heating *3	14~59°F D.B. (-10~15°C D.B.)

Electrical		
Electrical Power Requirements	1-phase, 208 / 230V, 60Hz	
Minimum Circuit Ampacity (MCA)	A	3.3 / 3.0
Recommended Fuse Size	A	15

External Dimensions (H x W x D)		
Unit	In. (mm)	15 x 47-1/16 x 35-7/16 (380 x 1,195 x 900)

Net Weight		
Unit	Lbs (kg)	109 (49)

External Finish	
Unit	Galvanized steel sheet

Coil Type	Cross fin (Aluminum fin and copper tube)

Fan		
Type x Quantity	Sirocco fan x 1	
Airflow Rate (Low-Mid2-Mid1-High) *4	CFM	500 - 550 - 600
Expernal Static Pressure *4	In. WG	0.60 - 0.80 - 1.00
Motor Type	DC Motor	
Motor Output	kW	0.244
Motor F.L.A.	A	2.7 / 2.4

Air Filter	Field Supply

Refrigerant Piping Diameter		
Liquid (High Pressure)	In. (mm)	3/8 (9.52) Brazed
Gas (Low Pressure)	In. (mm)	5/8 (15.88) Brazed

Field Drain Pipe Size	In. (mm)	O.D. 1-1/4 (32) x2

Sound Pressure Level		
Low-Mid-High	dB(A)	38-40-41

CITYMULTI®

6-TON TUHYE0723AN41AN

TRANE MITSUBISHI ELECTRIC

Job Name:

System Reference: Date:

208/230V OUTDOOR VRF HEAT PUMP SYSTEM

UNIT OPTION

☑ Standard Model TUHYE0723AN41AN

ACCESSORIES

☑ Big Foot Stand ..... for details see Big Foot Stands submittals

☑ Header Kit ..... for details see Pipe Accessories Submittal

☑ Joint Kit ..... for details see Pipe Accessories Submittal

☑ Low Ambient Kit ..... for details see Low Ambient Kit Submittal

☑ Panel Heater Kit ..... for details see Panel Heater Kit Submittal

☑ Snow/Hail Guards Kit ..... for details see Snow/Hail Guards Kit Submittal

Specifications			System
Unit Type			TUHYE0723AN41AN
Cooling Capacity (Nominal)		BTU/H	72,000
Heating Capacity (Nominal)		BTU/H	80,000
Guaranteed Operating Range	Cooling	°F [°C]	23~126 [-5.0~52.0]
	Heating	°F [°C]	-13~60 [-25.0~15.5]
Extended Operating Range	Heating	°F [°C]	-27.4~60 [-33.0~15.5]
External Dimensions (H x W x D)		In. [mm]	71-5/8 x 36-1/4 x 29-3/16 [1,818 x 920 x 740]
Net Weight		Lbs. [kg]	512 [232]
External Finish			Pre-coated galvanized steel sheet (+powder coating for -BS type) [MUNSELL 3Y 7.8/1.1 or similar]
Electrical Power Requirements	Voltage, Phase, Hertz, Power Tolerance		208/230V, 3-phase, 60 Hz, ±10%
Minimum Circuit Ampacity		A	32.0/29.0
Maximum Overcurrent Protection		A	50/45
Recommended Fuse Size		A	35/30
Recommended Minimum Wire Size		AWG [mm]	8/10 [8.4/5.3]
SCCR		kA	5
Refrigerant Piping Diameter	Liquid (High Pressure)	In. [mm]	3/8 [9.52] Brazed
	Gas (Low Pressure)	In. [mm]	7/8 [22.2] Brazed
Max. Total Refrigerant Line Length		Ft.	3,280 [1,000]
Max. Refrigerant Line Length (Between ODU & IDU)		Ft.	541 [165]
Max. Control Wiring Length		Ft.	1,640 [500]
Indoor Unit Connectable	Total Capacity		50.0~130.0% of outdoor unit capacity
	Model/Quantity		P04~P72/1.0~18.0
Sound Pressure Levels		dB(A)	55.0/57.0
Sound Power Levels		dB(A)	74.5/76.0
FAN[4]	Type x Quantity		Propeller fan x 1
	Fan Motor Output	kW	0.92
	Airflow Rate	CFM	6,000
	External Static Pressure	In. WG	Selectable; 0.00, 0.12, 0.24, 0.32, In. WG; factory set to 0 In. WG
Compressor Operating Range			15.0% to 100.0%
Compressor	Type x Quantity		Inverter scroll hermetic compressor x 1
Refrigerant	Type x Original Charge		R410A x 14.0 lbs + 5.0 oz [6.5 kg]
Protection Devices	High Pressure Protection		High pressure sensor, High pressure switch at 4.15 MPa (601 psi)
	Inverter Circuit (Comp./Fan)		Over-current protection
AHRI Ratings (Ducted/Non-ducted)	EER		12.2/13.7
	IEER		22.2/27.1
	COP		4.05/4.57

NOTES:
Nominal cooling conditions (Test conditions are based on AHRI 1230-2023)
Indoor: 80°FD.B./67°FW.B. (26.7°CD.B./19.4°CW.B.), Outdoor: 95°FD.B. (35°CD.B.)
Nominal heating conditions (Test conditions are based on AHRI 1230-2023)
Indoor: 70°FD.B. (21.1°CD.B.), Outdoor: 47°FD.B./43°FW.B. (8.3°CD.B./6.1°CW.B.)

[1]Harsh weather environments may demand performance enhancing equipment. Ask your Mitsubishi Electric representative for more details about your region
[2]For details on extended cooling operation range down to -10° F DB, see Low Ambient Kit Submittal
[3]When applying product below -4°F, consult your design engineer for cold climate application best practices, including the use of a backup source for heating
[4]Unit will continue to operate in extended operating range, but capacity is not guaranteed

OUTDOOR UNIT: TUHYE0723AN41AN – DIMENSIONS

PUHY-EP72T/YNU-A1

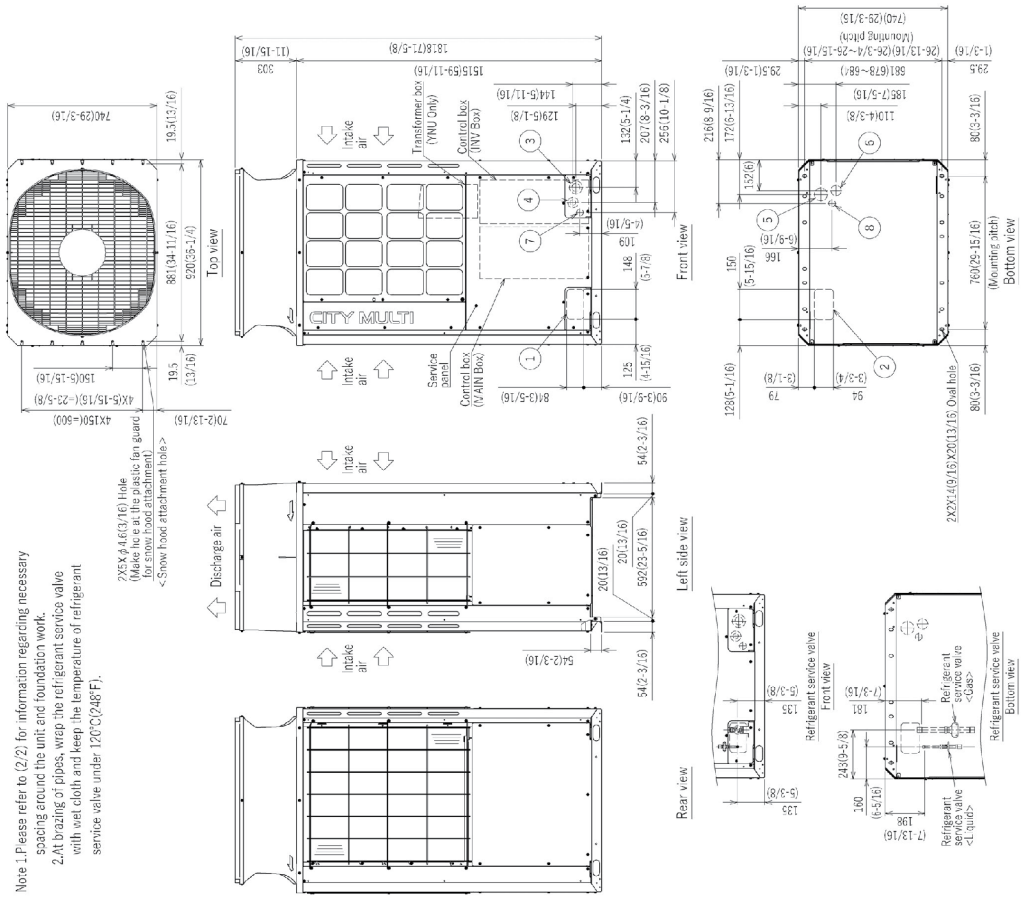
Unit: mm (in.)

Connecting pipe specifications

Model	Diameter			
	Refrigerant pipe *1		Service valve	
	Liquid	Gas	Liquid	Gas
(E)P72	ϕ9.52(3/8) Brazed	ϕ22.2(7/8) Brazed	ϕ9.52(3/8)	ϕ22.2(7/8)

*1 Connect the refrigerant pipe to the service valve according to the Installation Manual.

NO.	Usage	Specifications
①	For pipes	Front through hole: 148(5-7/8) X 84(3-5/16) Knockout hole
②		Bottom through hole: 190(5-15/16) X 94(3-3/4) Knockout hole
③		Front through hole: ϕ62.7(2-1/2) or ϕ34.5(1-3/8) Knockout hole
④	For wires	Front through hole: ϕ43.7(1-3/4) or ϕ22.2(7/8) Knockout hole
⑤		Bottom through hole: ϕ65(2-9/16) Knockout hole
⑥		Bottom through hole: ϕ52(2-1/16) Knockout hole
⑦	For transmission cables	Front through hole: ϕ34(1-3/8) Knockout hole
⑧		Bottom through hole: ϕ34(1-3/8) Knockout hole

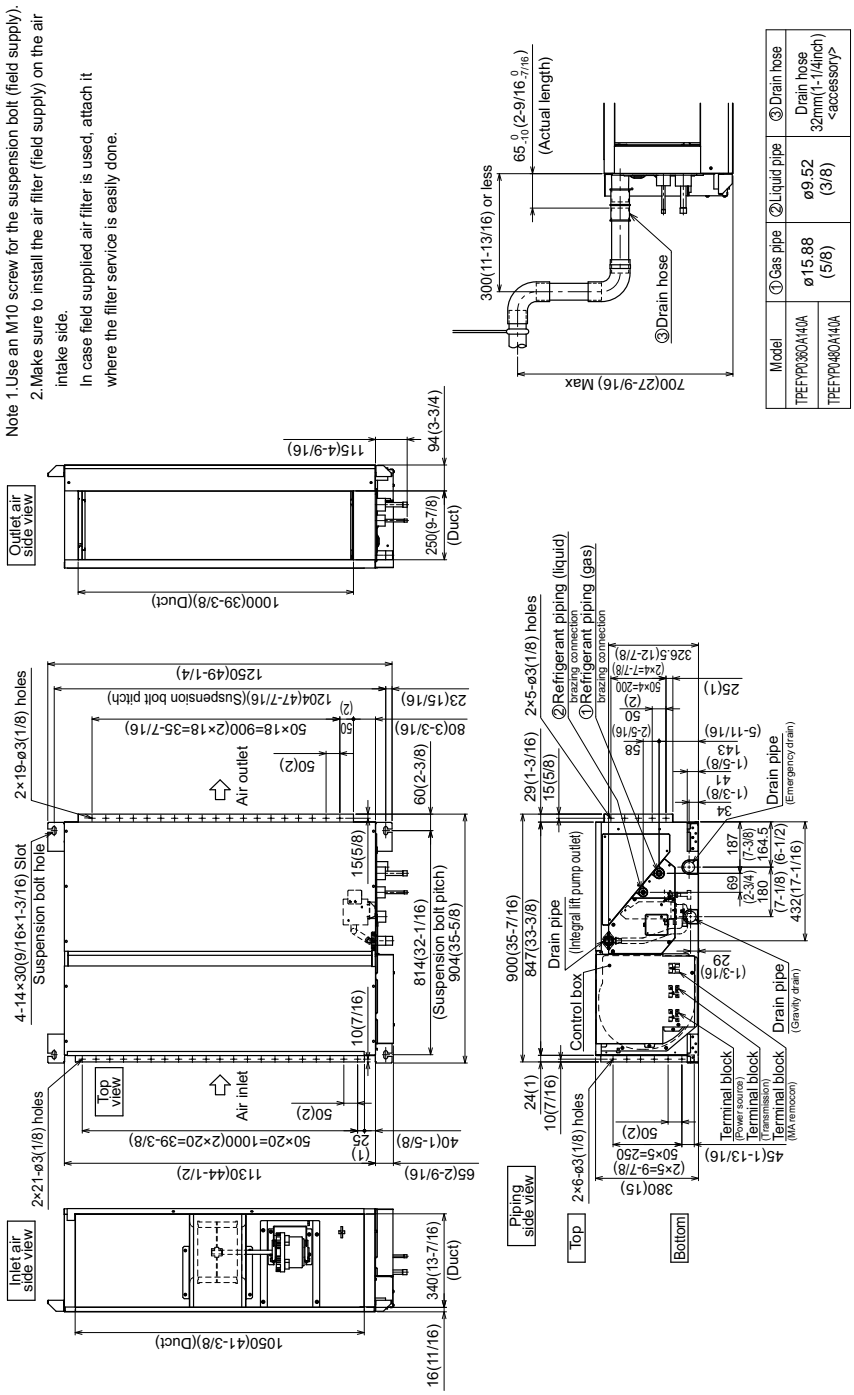


Note 1.Please refer to (2/2) for information regarding necessary spacing around the unit and foundation work.
2.At brazing of pipes, wrap the refrigerant service valve with wet cloth and keep the temperature of refrigerant service valve under 120°C(248°F).

Model: TPEFYP048OA140A – DIMENSIONS

TPEFYP(036/048)OA140A

Unit: mm (in.)



Stationary Refrigeration and Air Conditioning

Ozone Depleting Substances (ODS) Required Records

REQUIREMENT **Any** federal employee, contractor, or Self Help Section 233 projects that work on equipment containing refrigerant **SHALL** complete this form and provide the requested information.

LAW Section 608 of the Clean Air Act prohibits the knowing release of refrigerant during the maintenance, service, repair, or disposal of air-conditioning (AC) and refrigeration equipment. The EPA requires proper refrigerant management practices by technicians, owners and operators of refrigeration and AC systems, and others.

REQUIRED INFORMATION

Contract or Work Order Number: _____
Date of Service: _____
Date Completed: _____
Technician's Name: _____
Building Number: _____
Equipment Manufacturer, Model Number, and Serial Number: _____
Type of Refrigerant: _____
Full charge of refrigerant: _____
Service required: _____
Describe Work Done: _____
Initial Verification Test: _____
Date & Method: _____
Follow Up Verification Test: _____
Date and Method: _____

If a leak is detected
Leak detection date: _____
Refrigerant recovered (in lbs.): _____
Refrigerant reinstalled (in lbs.): _____
Refrigerant leaked or added (in lbs.): _____
Date refrigerant was last added: _____
Days since last charge of refrigerant: _____

ATTACH TO THIS FORM

1. Technician's Certification to work on Refrigeration Type
2. Disposal Manifest of any refrigerant removed

Return this form and attachments to:
Tom Valentour
Clean Air Act Program Manager
NAVFAC WASHINGTON
Naval Support Facility Dahlgren
18329 Thompson Road, Suite 226
Dahlgren, VA 22448
Thomas.m.valentour.civ@us.navy.mil
(540) 842-1062

https://www.epa.gov/section608