Brownsville Independent School District

Agenda Category: General Function **Board of Education Meeting:** 11-05-2025

Item Title: CSP #23-155 Aiken E.S. HVAC Upgrades, Phase I (Package 2) Project Substantial Completion

X **Action**
___ **Information**
___ **Discussion**

BACKGROUND:

CSP#23-155 Aiken E.S. HVAC Upgrades, Phase I (Package 2) Project, is ready for Substantial Completion acceptance by the Brownsville ISD Board of Trustees. The Project Engineer, General Contractor and, BISD Facilities Department Administration staff conducted a walk-thru to provide a Punch List. As a result, the Administration recommends substantial completion acceptance for this project.

Attached for reference find the following document(s).
Aiken E.S. HVAC Upgrades, Phase I (Package 2) Project:

- AIA Document G704-2017
- Punch List
- Commissioning Report
- CSP #23-155

FISCAL IMPLICATIONS:

None

RECOMMENDATION:

Recommend approval to authorize the Aiken E.S. HVAC Upgrades, Phase I (Package 2) Project, under CSP # 23-155, as substantially complete.

Alonso Guerrero
Submitted by: Health Services & Operations

Alonso Guerrero
Recommended by: Health Services & Operations

Mary D. Garza
Approved by: Interim-Chief Financial Officer

Approved for Submission to Board of Education:

Dr. Jesus H. Chavez, Superintendent

When Necessary, Additional Background May Follow This.

AIA Document G704 – 2017

Certificate of Substantial Completion

PROJECT: *(name and address)* BISD ESSER HVAC Upgrades at Aiken	**CONTRACT INFORMATION:** Contract For: Central Air Heating Services Date: 05/23/2024	**CERTIFICATE INFORMATION:** Certificate Number: 001 Date: 05/23/2024
OWNER: *(name and address)* Brownsville ISD 1900 E. Price Rd., Brownsville, TX 78521	**ARCHITECT:** *(name and address)* Halff Associates, Inc. (as Consultant not Architect) 5000 West Military Highway Suite 100. McAllen, Texas	**CONTRACTOR:** *(name and address)* Centrail Air Heating Services 3028 Wilson Rd., Harlingen, TX, 78552

The Work identified below has been reviewed and found, to the Architect's best knowledge, information, and belief, to be substantially complete. Substantial Completion is the stage in the progress of the Work when the Work or designated portion is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. The date of Substantial Completion of the Project or portion designated below is the date established by this Certificate.
(Identify the Work, or portion thereof, that is substantially complete.)

Halff Associates, Inc. (as Consultant not Architect) ARCHITECT *(Firm Name)*	SIGNATURE	Gabriel Benavides, PE Vice President Director of MEP PRINTED NAME AND TITLE	05/23/2024 DATE OF SUBSTANTIAL COMPLETION

WARRANTIES
The date of Substantial Completion of the Project or portion designated above is also the date of commencement of applicable warranties required by the Contract Documents, except as stated below:
(Identify warranties that do not commence on the date of Substantial Completion, if any, and indicate their date of commencement.)

WORK TO BE COMPLETED OR CORRECTED
A list of items to be completed or corrected is attached hereto, or transmitted as agreed upon by the parties, and identified as follows:
(Identify the list of Work to be completed or corrected.)

The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. Unless otherwise agreed to in writing, the date of commencement of warranties for items on the attached list will be the date of issuance of the final Certificate of Payment or the date of final payment, whichever occurs first. The Contractor will complete or correct the Work on the list of items attached hereto within thirty (30) days from the above date of Substantial Completion.

Cost estimate of Work to be completed or corrected: $10,000

The responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work, insurance, and other items identified below shall be as follows:
(Note: Owner's and Contractor's legal and insurance counsel should review insurance requirements and coverage.)

The Owner and Contractor hereby accept the responsibilities assigned to them in this Certificate of Substantial Completion:

CAHS CONTRACTOR *(Firm Name)*	Colin Eubanks SIGNATURE	Colin Eubanks (PM) PRINTED NAME AND TITLE	05/23/2024 DATE
Brownsville I.S.D. OWNER *(Firm Name)*	SIGNATURE	Manuel Hinojosa. FAIA PRINTED NAME AND TITLE	May 14 2025 DATE

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Punch List

To:	Manuel Hinojosa	**Date:**	5/31/2024
From:	Luis E Hernandez Nava	**AVO:**	45813.001
Email:	lhernandeznava@halff.com	**Project:**	ESSER HVAC Upgrades at Aiken
Contract for:	BISD ESSER HVAC Upgrades at Aiken Elementary		

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

ITEM NO.	LOCATION (AREA)	DESCRIPTION	COMPLETION DATE	A/E CHECK DATE
1.	Mechanical Room	New chilled water lines (supply and return) are missing labels.		
2.	Mechanical Room	New chilled water lines connecting to existing appear to be leaking on top of relocated pumps' VFDs. VFDs are missing covers. General Contractor shall relocate VFD to avoid water leakages on top of electrical equipment and repair chilled water lines leaking.		
3.	Mechanical Room	Secondary pump not working and missing labels.		
4.	OUA	Typical of ALL OAUs: Outside air lover penetration is not sealed properly. The General Contractor shall properly seal all penetrations through the exterior wall. Pipe penetration through the exterior is not properly capped or sealed. Unconditioned air can infiltrate into the space through these penetrations.		

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ITEM NO.	LOCATION (AREA)	DESCRIPTION	COMPLETION DATE	A/E CHECK DATE
		The ductwork connecting the louver to OAU is not sealed properly. The actuator controlling the motorized damper has not been installed. All OAU were down at the time of the site visit. The condensate pump is not installed properly or is missing. The condensate line is not connected to the pump. If a condensate pump is not required, the General Contractor shall provide credit to the Owner. Duct hangers not attached to ductwork.		
5.	OAU	OAU disconnect is installed, but the work appears to be in progress since the box is open with wires exposed. Air Flow Monitor Stations (AFMS) are not installed on OAUs.		
6.	BCU	Typical of ALL BCUs: The filter installed is not the adequate size for the BCU. BCU labels installed do not match the rooms' numbers on the second floor.		
7.	T-STAT	Typical of all T-Stats: The thermostat does not provide RH setpoint or current levels.		
8.	Lobby	Condensate pipe not insulated/installed properly to the BCU. The ceiling tile shows visible water stains due to condensation.		

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ITEM NO.	LOCATION (AREA)	DESCRIPTION	COMPLETION DATE	A/E CHECK DATE
9.	Classroom C107	Lights not working after equipment installation.		
10.	Classroom C108	Lights not working after equipment installation.		
11.	A101	The room feels humid. The T-stat does not show RH%.		
12.	A102	The room feels humid. The T-stat does not show RH%.		
13.	A103	The room feels humid. The T-stat does not show RH%.		
14.	A104	The room feels humid. The T-stat does not show RH%.		
15.	A105	The room feels humid. The T-stat does not show RH%.		
16.	A106	The room feels humid. The T-stat does not show RH%.		
17.	A107	The room feels humid. The T-stat does not show RH%.		
18.	A108	The room feels humid. The T-stat does not show RH%.		
19.	B214	The room feels humid. The T-stat does not show RH%.		
20.	B216	The room feels humid. The T-stat does not show RH%.		
21.	B218	The room feels humid. The T-stat does not show RH%.		
22.	Controls	New OAU, Pumps, Exhaust Fans and BCUs have not been integrated into existing controls system.		
23.	Classrooms	The General Contractor shall replace all ceiling tiles in poor shape. The General Contractor shall remove any material no longer		

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ITEM NO.	LOCATION (AREA)	DESCRIPTION	COMPLETION DATE	A/E CHECK DATE
		used and keep all classrooms ready to be occupied.		

☐ Attachments

SIGNED: Luis Hernandez Nava, PE, CPD

COPIES: ☐ Owner ☐ Contractor ☐ File

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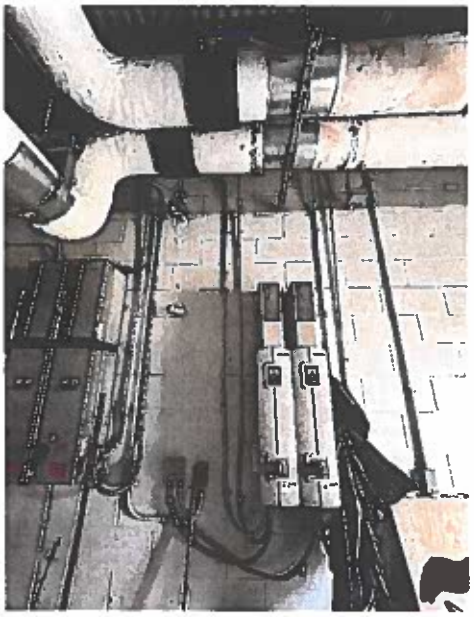

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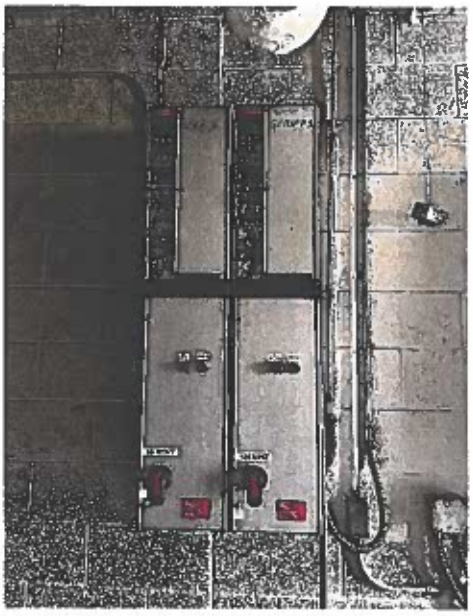

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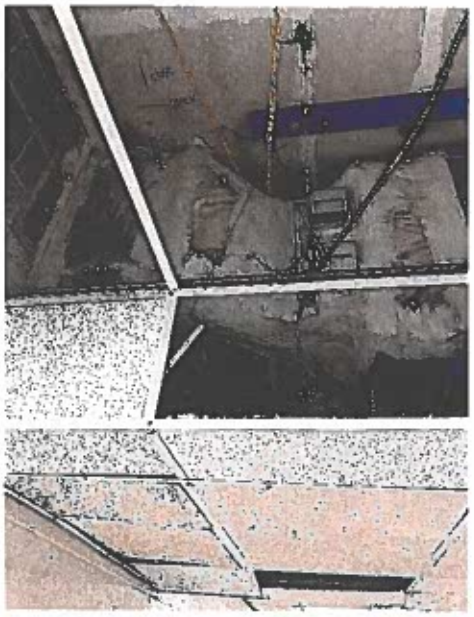

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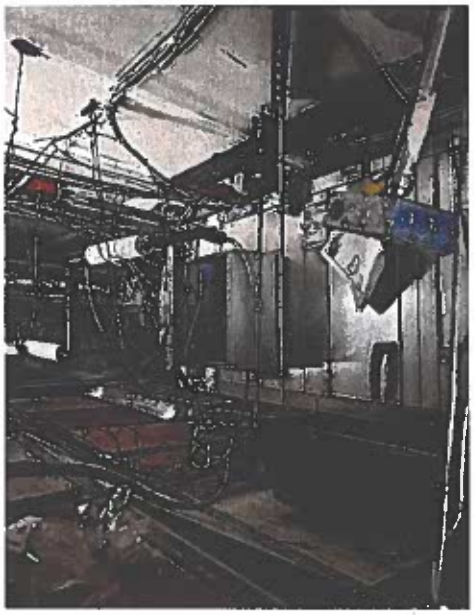

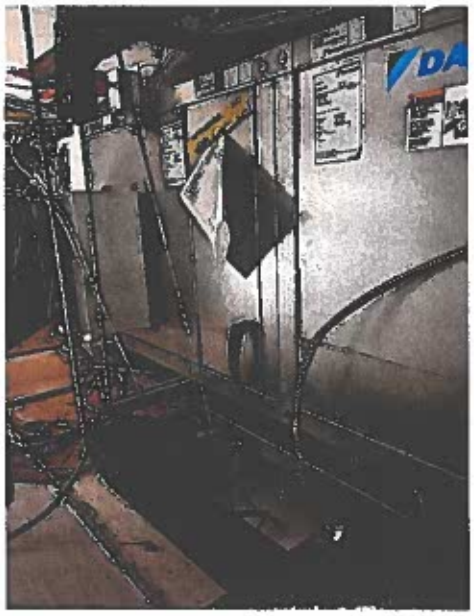

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Final
Commissioning Report

Prepared for:

BISD – Aiken Elementary School

Friday, March 14, 2025

1025 Morningside Rd, Brownsville, Tx 78521

Texas Board of Professional Engineers

Registered Firm #F-312

Scope of Services for BISD – Commissioning

SCOPE OF WORK

Commissioning shall be provided by the Commissioning Agent (CxA), Halff Associates, Inc., to confirm the installed system's compliance with the Construction Documents for operation capacity and compliance with the project's Sequences of Operations (SOO).

- Confirmation of Owner-Provided-Requirements (OPR)
- Establishing communication between CxA and contractors
- Verification of integration between the DDC system and the connected equipment
- Graphics review of the BAS system for accuracy and usefulness
- Periodic sampling of the Test, Adjust, and Balance (TAB)
- Construction Document's SOO review
- Trend comparison between BAS and CxA's independent readings
- Witness Manufacturer's required startup of equipment
- Observe functional testing of equipment in compliance with the SOO

Commissioning Team Contact Information

Team Member	Company	Contact Person	Office #	Mobile #	Email Address
Owner	Brownsville Independent School District	Manuel Hinojosa	956-698-2400		Mhinojosa1@bisd.us
Engineer of Record	Halff	Luis Hernandez Nava	956-664-0286		lhernandeznava@halff.com
Commissioning Agent	Halff	Dean Lizzotte	956-664-0286	956-369-9253	Dlizzotte@halff.com
General Contractor	Central Air and Heating	Colin Eubanks	926-428-4509	956-572-1738	colin.eubanks@cahsinc.com
Mechanical SubCon	Central Air and Heating	Colin Eubanks	926-428-4509	956-572-1738	colin.eubanks@cahsinc.com
Electrical SubCon	Pete's Electric LLC		956-230-8340		PETESELECTRICCO@AOL.COM
Controls SubCon	Automated Logic	Raul Gonzalez	210-825-9354		raul.gonzalez@carrier.com
Test and Balance SubCon	Testing & CX Service	Art Olivares	956-874-5889		art@testandcx.com

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Commissioning Communications Log

Description	Date	Form of Communication	Sent To	Sent By
Initial Cx Plan		Email	Fernando Villarreal	Dean Lizzotte
Graphics Comments	8/13/24	Email	Coling Eubanks	Dean Lizzotte
Graphics Comments	9/9/24	Email	Coling Eubanks	Dean Lizzotte
Prefunctional Testing Attempt	9/11/24	Site Visit	----	Dean Lizzotte
Project Status Update	9/19/24	Email	Coling Eubanks	Dean Lizzotte
Controls Meeting	9/19/24	Teams Meeting	Colin Eubanks	Dean Lizzotte
Prefunctional Testing Attempt	10/11/24	Site Visit	----	Dean Lizzotte
Prefunctional Testing Attempt	10/16/24	Site Visit	----	Dean Lizzotte
Prefunctional Testing Attempt	10/17/24	Site Visit	----	Dean Lizzotte
Status Meeting	11/1/24	Teams Meeting	Colin Eubanks	Dean Lizzotte
BAS Status Update	10/8/24	Email	Coling Eubanks	Luis Hernandez Nava
TAB Report Follow Up	12/19/24	Email	Coling Eubanks	Luis Hernandez Nava
Graphics Status Update	12/4/24	Email	Coling Eubanks	Dean Lizzotte
TAB Report Follow Up	1/8/24	Email	Coling Eubanks	Luis Hernandez Nava
Final Cx Report	3/14/25	Email	Manuel Hinojosa	Dean Lizzotte

Pre-functional Startup Testing

Introduction

The purpose of the pre-functional start-up testing is to verify that installation checklists and proper start-up protocols are followed. This allows for an alignment of the Owner's project requirements with the contractor's work. Any identified issues shall be documented in the issues and resolutions log for either the commissioning progress report or the final commissioning report. The pre-functional start-up scripts shall be provided by the equipment manufacturer.

Communication

Documentation for pre-functional startup checklists is attached and represents manufacturers recommended practices for start-up. The documents shall be signed by the Cx agent, owner's representative, and contractor representative. An example of an Issues and Resolutions Log is also attached.

Procedures

1. The Contractor shall perform the startup while the CxA witnesses and observes the operation.
2. If any issues occur, they shall be promptly documented into the Issues and Resolution Log.
3. The potential resolution shall be submitted.
4. After the issue has been resolved the process shall be re-attempted.
5. If startup completes without any reported issues then the document shall be signed by witnessing parties: the CxA, the Contractor's representative, and the Owner's representative.

Notes: Any equipment started without witnessing by the CxA shall be documented.

Multiple communication attempts and site visits were attempted for the Aiken Elementary HVAC Renovation process pre-functional testing. Units in scope appear to be functioning. However, the commissioning process could not be performed due to the contractor being unable to provide sufficient documentation regarding testing and balance in order to observe operation.

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Graphics Review

Introduction

The purpose of the graphics review is to align the Controls Subcontractor with the Owner's project requirements. The review shall examine the general aesthetics of the BAS system, verification that all the equipment is readily available, and reporting accuracy. The graphics review requires the CxA to receive access to the BAS during and after installation.

Communication

Documentation for pre-graphics review is attached. The documents after the competition shall be signed by the CxA, Owner's representative, and Contractor representative. An example of a Issues and Resolutions Log is also attached.

Procedures

1. Access to the project's BAS
2. Analysis shall be performed for any graphical glitches or major issues.
3. The individual views shall be compared against the installed schedules to verify if all the proper equipment is on the screen.
4. The information on the BAS shall be compared to the information from the installed equipment itself or if available testing instrumentation.
5. The alarms shall then be tested to verify proper setup.
6. Any identified issues shall be documented in the Issues and Resolutions Log.
7. If resolved the building automation system shall be reviewed once more.
8. When the review has been completed the document shall be signed by the witnessing parties including up to the CxA, the Owner's representative, and the Contractor's representative.

Notes: The CxA shall need remote access to the BAS during and after the graphics review.

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Graphics Review

Job Name	Esser Aiken Elementary		
	Yes	No	Initials
Are all the VFD's displayed on the screen?		X	DL
Are all dedicated outside air systems displayed on the screen?	X		DL
Are all pumps displayed on the screen?	X		DL
Are all chillers displayed on the screen?	X		DL
Are the all the fan arrays displayed on the screen?	X		DL
Are all roof-top units displayed?	X		DL
Are all boilers displayed on the screen?		X	DL
Are all water coils displayed on the screen?	X		DL
Are all flow rates displayed on the screen?	X		DL
Are all pressures displayed on the screen?	X		DL
Are all maintenance reminders displayed on the screen?	X		DL
Do the graphics make sense for the general user?	X		DL
Do all the alarms display accurately and prominently?	X		DL

Notes:

Halff Cx Agent		**General Contractors Representative**		**Owners Representative**	
Signed*:		Signed:		Signed:	
Name:	Dan Lizotte	Name:		Name:	
Company:	Halff	Company:		Company:	
Date:	3/8/25	Date:		Date:	
Phone/Emails:	dlizotte@halff.com	Phone/Emails:		Phone/Emails:	

*Initialing Authority

Sequence of Operations Review and Verification

Introduction

The purpose of the sequence of operations review is to verify that the equipment functions normally during intended conditions. The SOO review and data logger confirmation must be performed after TAB and controls subcontractors have concluded their work.

Communication

The documents after the completion shall be signed by the CxA, the Owner's representative, and the Contractor representative. The Issues and Resolution Log is attached.

Procedures

1. First, a sample of equipment is taken from the schedule.
2. The controls sequences for the selected sample are tested and verified per the Construction Documents.
3. The data collected shall span a month after the completion of the SOO review.
4. The CxA shall review the data from the BAS and the CxA data loggers for the same areas to ensure the HVAC system stability.

   Note: Multiple communication attempts and site visits were attempted for the Aiken Elementary HVAC Renovation commissioning process. Units in scope appear to be functioning. However, the commissioning process could not be performed due to the contractor being unable to provide sufficient documentation regarding testing and balance in order to observe operation.

Deficiency Report

PROJECT: BISD - Aikens Elementary School HVAC Upgrades
LOCATION: BROWNSVILLE, TX
PROJECT #: 3220151

DATE: 5/28/2024
CONTACT: Art Olivares
AUTHOR: Arturo Olivares

Issue ID:	0001	Status:	Open	Issue Priority:	High
Equipment:	EDH-B102				Created Date: 14-May-24
Issue Description:					
The disconnect is off.					
Issue Type:	Not Operable				
Role Assignment:	Mechanical Contractor				
User Assignment:	Juan Coronado				
Comments / Signature:					

Issue ID:	0002	Status:	Open	Issue Priority:	High
Equipment:	EDH-B100				Created Date: 14-May-24
Issue Description:					
Heaters not responding.					
Issue Type:	Not Operable				
Role Assignment:	Controls Contractor				
User Assignment:	Juan Coronado				
Comments / Signature:					

Issue ID:	0004	Status:	Open	Issue Priority:	High
Equipment:	EDH-A108				Created Date: 14-May-24
Issue Description:					
Heaters not responding.					
Issue Type:	Not Operable				
Role Assignment:	Controls Contractor				
User Assignment:	Juan Coronado				
Comments / Signature:					

Issue ID:	0006	Status:	Open	Issue Priority:	High
Equipment:	EDH-A102				Created Date: 15-May-24
Issue Description:					
Heaters not responding.					
Issue Type:	Not Operable				
Role Assignment:	Controls Contractor				
User Assignment:	Juan Coronado				
Comments / Signature:					

Issue ID:	0007	Status:	Open	Issue Priority:	High
Equipment:	BCU-A105				Created Date: 15-May-24
Issue Description:					
Missing insulation					
Issue Type:	Observation				
Role Assignment:	Mechanical Contractor				
User Assignment:	Juan Coronado				
Comments / Signature:					

Deficiency Report

PROJECT: BISD - Aikens Elementary School HVAC Upgrades
LOCATION: BROWNSVILLE, TX
PROJECT #: 3220151

DATE: 5/28/2024
CONTACT: Art Olivares
AUTHOR: Arturo Olivares

Issue ID:	0009	Status:	Open	Issue Priority:	High
Equipment:	BCU-Admin				Created Date: 20-May-24

Issue Description:
Missing insulation

Issue Type: Observation
Role Assignment: Mechanical Contractor
User Assignment: Juan Coronado
Comments / Signature:

Issue Photos:

Name: .jpg
Captured: 5/20/2024 7:02 PM

Issue ID:	0010	Status:	Open	Issue Priority:	High
Equipment:	EDH-B212				Created Date: 22-May-24

Issue Description:
Heaters are shattering

Issue Type: Observation
Role Assignment: Mechanical Contractor
User Assignment: Juan Coronado
Comments / Signature:

Issue ID:	0011	Status:	Open	Issue Priority:	High
Equipment:	EDH-B217				Created Date: 22-May-24

Issue Description:
Heaters not responding.

Issue Type: Not Operable
Role Assignment: Controls Contractor
User Assignment: Juan Coronado
Comments / Signature:

Deficiency Report

PROJECT: BISD - Aikens Elementary School HVAC Upgrades
LOCATION: BROWNSVILLE, TX
PROJECT #: 3220151

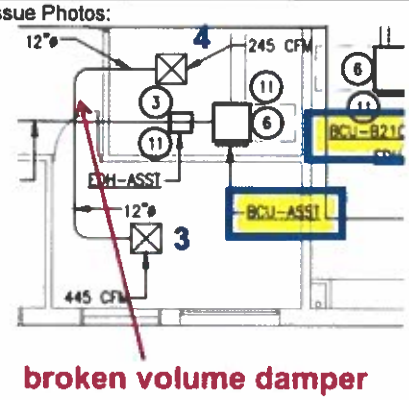
DATE: 5/28/2024
CONTACT: Art Olivares
AUTHOR: Arturo Olivares

Issue ID:	0012	Status:	Open	Issue Priority:	High
Equipment:	BCU-Asst/Outlet-04				Created Date: 23-May-24

Issue Description:
Has a broken volume damper

Issue Type: Incorrect Operation
Role Assignment: Mechanical Contractor
User Assignment: Juan Coronado
Comments / Signature:

Issue Photos:



broken volume damper

Name: pictures.png
Captured: 5/23/2024 7:30 PM

CAHS
A MODIBENT COMPANY

All ways forward.

WARRANTY

Installed at: Aiken Elementary School
6290 Southmost Rd
Brownsville, Texas 78521

Dates of Substantial Completion: June 02, 2024

Central Air & Heating Service will provide a 1-year comprehensive warranty on all products and equipment installation services provided under this contract from the dates above for each area as indicated. This warranty is restricted and governed by the Warranty Coverage Guideline (see reverse) and by the warranty certificates provided by the manufacturer enclosed.

- Daikin Applied, warranty included in closeout documentation.
- Bell & Gossett, warranty included in closeout documentation.

Warranty Service will only be performed during normal working hours 8:00 – 5:00 Monday thru Friday.

Warranty Service calls must be phoned in to:
Central Air & Heating Service, Inc.
Commercial Service Department
956-428-4509

Signature _____
Title PRESIDENT
Date 4-11-2024

STATE OF Texas
COUNTY OF Cameron

Acknowledged before me this 11th day of April 2024, by Jeff D. Matz (name), President (job title), of CAHS (company name).

ELIUD BANDA
Notary Public, State of Texas
Comm. Expires 04-24-2027
Notary ID 126053928

NOTARY PUBLIC, STATE OF TEXAS

CAHS
A MODIBENT COMPANY

All ways forward.

Warranty Coverage Guidelines

This document is to be utilized as a guideline for customers to clarify what labor and material costs are covered by the warranty and subsequently when a customer can expect to be billed for labor and material during a warranty period.

Warranty labor and parts are for equipment failure due to faulty parts or components or failure due to the installation technique of Central Air & Heating Service.

Not covered by warranty labor: Calls for repair or service after normal working hours and during holidays. All warranty is to be performed during normal working hours.

Not covered by warranty labor or parts:

1. ACTS OF GOD: Damages and or repairs necessary to equipment or devices as a result of natural disasters, Rainstorms, electrical storms, hurricanes, etc...
2. ELECTRICAL: Surges, Power outages, tripped breakers after power outages or surges. Damaged Equipment or components due to aforementioned.
3. MAINTENANCE ITEMS: Equipment failure or component failure due to lack of maintenance, Dirty Coils, Loose belts, loose connections, dirty filters, stopped up drains, missing covers, missing caps, rust and corrosion due to exposure to chemicals and gases.
4. Misuse and abuse: stripped screws, broken access levers and hinges, etc. are not covered under warranty and any equipment failure or malfunction resulting from these items is not covered.
5. Failure due to owner repairs and or maintenance: rewiring or wiring around safeties, improper belts, filters, etc.
6. Failures due to owner programming or scheduling which would change or alter initial commissioning of equipment.
7. Service Charges: CAHS will charge for dispatching a technician and his/her associated labor for all time incurred for responding to call (Service charge), Travel time, diagnosing problem and advising customer of corrective action taken or necessary repairs resulting from any of the items above 1-6.

It is in the Customer's best interest to perform a preliminary investigation and visual diagnostic of equipment and controls to verify that equipment is turned on, thermostat is set correctly, controls are asking equipment to run, filters, belts and drains are all in maintained condition, panels are all on, electrical voltages are correct and that there is no obvious reason for the unit not performing prior to requesting a call for service. Firstly, all this information would help in diagnosis and secondly, it may prevent unnecessary charges to the customer.

Final
Commissioning Report

Prepared for:

BISD – ESSER AIKEN Elementary

halff

Tuesday, September 23, 2025

6290 Southmost Rd., Brownsville, Tx 785421

Texas Board of Professional Engineers

Registered Firm #F-312

Colin Eubanks

CAHS

Scope of Services for BISD – Commissioning

SCOPE OF WORK

Commissioning shall be provided by the Commissioning Agent (CxA), Halff Associates, Inc., to confirm the installed system's compliance with the Construction Documents for operation capacity and compliance with the project's Sequences of Operations (SOO).

- Confirmation of Owner-Provided-Requirements (OPR)
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- Trend comparison between BAS and CxA's independent readings
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- Observe functional testing of equipment in compliance with the SOO

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Engineer of Record	Halff	Luis Hernandez Nava	956-664-0286		lhernandeznava@halff.com
Commissioning Agent	Halff	Dean Lizzotte	956-664-0286	956-369-9253	Dlizzotte@halff.com
General Contractor	Central Air and Heating	Colin Eubanks	926-428-4509	956-572-1738	colin.eubanks@cahsinc.com
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Controls SubCon	Automated Logic	Raul Gonzalez	210-825-9354		raul.gonzalez@carrier.com
Test and Balance SubCon	Testing & CX Service	Art Olivares	956-874-5889		art@testandcx.com

halff

Commissioning Communications Log

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Prefunctional Testing Attempt	10/16/24	Site Visit	----	Dean Lizzotte
Prefunctional Testing Attempt	10/17/24	Site Visit	----	Dean Lizzotte
Status Meeting	11/1/24	Teams Meeting	Colin Eubanks	Dean Lizzotte
BAS Status Update	10/8/24	Email	Coling Eubanks	Luis Hernandez Nava
TAB Report Follow Up	12/19/24	Email	Coling Eubanks	Luis Hernandez Nava
Graphics Status Update	12/4/24	Email	Coling Eubanks	Dean Lizzotte
TAB Report Follow Up	1/8/24	Email	Coling Eubanks	Luis Hernandez Nava
Final Commissioning Report	3/14/25	Email	Miguel Hinojosa	Dean Lizzotte
Prefunctional Testing	5/20/25	Site Visit	----	Dean Lizzotte
Final Commissioning Report	9/223/25	Email	Miguel Hinojosa	Dean Lizzotte

Pre-functional Startup Testing

Introduction

The purpose of the pre-functional start-up testing is to verify that installation checklists and proper start-up protocols are followed. This allows for an alignment of the Owner's project requirements with the contractor's work. Any identified issues shall be documented in the issues and resolutions log for either the commissioning progress report or the final commissioning report. The pre-functional start-up scripts shall be provided by the equipment manufacturer.

Communication

Documentation for pre-functional startup checklists is attached and represents manufacturers recommended practices for start-up. The documents shall be signed by the Cx agent, owner's representative, and contractor representative. An example of an Issues and Resolutions Log is also attached.

Procedures

1. The Contractor shall perform the startup while the CxA witnesses and observes the operation.
2. If any issues occur, they shall be promptly documented into the Issues and Resolution Log.
3. The potential resolution shall be submitted.
4. After the issue has been resolved the process shall be re-attempted.
5. If startup completes without any reported issues then the document shall be signed by witnessing parties: the CxA, the Contractor's representative, and the Owner's representative.

Notes: Any equipment started without witnessing by the CxA shall be documented.

Multiple communication attempts and site visits were attempted for the Aiken Elementary HVAC Renovation process pre-functional testing. Units in scope appear to be functioning. However, the commissioning process could not be performed due to the contractor being unable to provide sufficient documentation regarding testing and balance in order to observe operation.

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Pre-Functional Checklist – Blower Coil Unit

Job Name	BISD Aiken - HVAC Renovations
Installation Location	BC4-C108
AVO	45813.006
Serial Number	E-0349503014 00
Model Number(s)	BC.H.D.010

Fan Coil Unit	Witnessed	N/A	Initials	See Notes
Verify inlet and outlet duct lengths are approximately two- or three-wheel diameters long before and after the fan.	✓		DL	
Verify discharge is orientated in the same direction as originally ordered.	✓		DL	
Check all fasteners for tightness. Check the setscrews in the wheel hub (and pulleys, if applicable).	✓		DL	
Start the fan and shut it off immediately to check the rotation of the wheel	✓		DL	
Vibration Isolators: Make certain all connectors are tight and that all washers are in.	✓		DL	
Check pulley for proper alignment for BSQ-M Fans.		✓	DL	

Notes:

Halff Cx Agent
Signed*:
Name: Dean Lizotte
Company: Halff
Date: 10-17-24
Phone/Emails: dlizotte@halff.com
*Initialing Authority

General Contractors Representative
Signed:
Name: Ken Ballesteros
Company: CMS
Date: 10-17-2024
Phone/Emails: 956-244-4207

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

halff

Pre-Functional Checklist – Chilled Water Dedicated Outdoor Air System Unit

Job Name	BISD Aiken - HVAC Renovations
Installation Location	OAU-5
Serial Number	CAH0056 VCM
Model Number(s)	E 034950 302300
A.V.O. Number(s)	45183.006

Chilled Water Outdoor Air Unit	Witnessed	N/A	Initials	See Notes
Verify voltage is present and landed at equipment.	✓		DL	
Verify gas piping is complete and landed at each component. Inlet gas pressure to be between 7 in. wg and 14 in. wg.		✓	DL	
Verify field installed sensors installed.	✓		DL	
Verify control wiring installed and landed.	✓		DL	✓
Verify accessories installed.	✓		DL	
Check ductwork installed (all runs in place, final tie in complete).	✓		DL	
Check that drain lines are installed and properly terminated.	✓		DL	
Verify Phase Monitor:		✓	DL	
Verify voltage on phase monitor.		✓	DL	
Check UC600 Setpoints:			DL	
Verify Duct Static Pressure setpoint	✓		DL	
Verify Minimum OA Damper position	✓		DL	
rify Maximum OA Damper position	✓		DL	
Verify Supply Air Flow Setpoint.	✓		DL	
Verify Exhaust Air Flow Setpoint.		✓	DL	
Identify Airflow Monitoring:	✓		DL	

Notes: BISD to provide FA wiring & controls; Condensate pump missing on light

Halff Cx Agent
Signed*: [signature]
Name: Dean Littlefield
Company: Halff
Date: 10-17-24
Phone/Emails: dlittlefield@halff.com
*Initialing Authority

General Contractors Representative
Signed: [signature]
Name: Ray Ballesteros
Company: CAHS
Date: 10-17-2024
Phone/Emails: 956-264-4207

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

halff

Pre-Functional Checklist – Chilled Water Dedicated Outdoor Air System Unit

Job Name	BISD Aiken - HVAC Renovations
Installation Location	OAU-6
Serial Number	FBQY2307025G2
Model Number(s)	CAH00060VCM
A.V.O. Number(s)	45813.006

Chilled Water Outdoor Air Unit	Witnessed	N/A	Initials	See Notes
Verify voltage is present and landed at equipment.	✓		DE	
Verify gas piping is complete and landed at each component. Inlet gas pressure to be between 7 in. wg and 14 in. wg.		✓	DL	
Verify field installed sensors installed.	✓		DL	
Verify control wiring installed and landed.	✓		DL	✓
Verify accessories installed.	✓		DL	
Check ductwork installed (all runs in place, final tie in complete).	✓		DL	
Check that drain lines are installed and properly terminated.			DL	✓
Verify Phase Monitor:		✓	DL	
Verify voltage on phase monitor.		✓	DL	
Check UC600 Setpoints:		✓	DL	
Verify Duct Static Pressure setpoint	✓		DL	
Verify Minimum OA Damper position	✓		DL	
Verify Maximum OA Damper position	✓		DL	
Verify Supply Air Flow Setpoint.	✓		DL	
Verify Exhaust Air Flow Setpoint.		✓	DL	
Identify Airflow Monitoring:	✓		DL	

Notes: BISD to provide FA wiring + Controls; Drain pan pooling + leaking

Halff Cx Agent	General Contractors Representative	Owners Representative
Signed*:	Signed:	Signed:
Name: Dean Lizzotte	Name: Ray Ballesteros	Name:
Company: Halff	Company:	Company:
Date: 9-11-24	Date:	Date:
Phone/Emails: dlizzotte@halff.com	Phone/Emails:	Phone/Emails:

*Initialing Authority

halff

Pre-Functional Checklist – Chilled Water Dedicated Outdoor Air System Unit

Job Name	BISD Aiken HVAC Renovation
Installation Location	OAU-2
Serial Number	FBQU130702562
Model Number(s)	CAH006GVCM
A.V.O. Number(s)	45813.006

Chilled Water Outdoor Air Unit	Witnessed	N/A	Initials	See Notes
Verify voltage is present and landed at equipment.	✓		DL	
Verify gas piping is complete and landed at each component. Inlet gas pressure to be between 7 in. wg and 14 in. wg.		✓	DL	
Verify field installed sensors installed.	✓		DL	
Verify control wiring installed and landed.	✓		DL	
Verify accessories installed.	✓		DL	
Check ductwork installed (all runs in place, final tie in complete).	✓		DL	
Check that drain lines are installed and properly terminated.	✓			✓
Verify Phase Monitor:		✓		
Verify voltage on phase monitor.		✓		
Check UC600 Setpoints:		✓	DL	
Verify Duct Static Pressure setpoint	✓		DL	
Verify Minimum OA Damper position	✓		DL	
Verify Maximum OA Damper position	✓		DL	
Verify Supply Air Flow Setpoint.	✓		DL	
Verify Exhaust Air Flow Setpoint.		✓	DL	
Identify Airflow Monitoring:	✓		DL	

Notes: Drain pan pooling + leaking; BISD to provide FA wiring & controls

Halff Cx Agent	General Contractors Representative	Owners Representative
Signed*:	Signed:	Signed:
Name: DeBellotte	Name: Ray Ballesteros	Name:
Company: Halff	Company:	Company:
Date: 9-11-24	Date:	Date:
Phone/Emails: cl.220400@halff.com	Phone/Emails:	Phone/Emails:

*Initialing Authority

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Pre-Functional Checklist – Chilled Water Dedicated Outdoor Air System Unit

Job Name	BISD Aiken HVAC Renovation
Installation Location	OAU - 10
Serial Number	FB0U230702563
Model Number(s)	CAH0056VCM
A.V.O. Number(s)	45813.006

Chilled Water Outdoor Air Unit	Witnessed	N/A	Initials	See Notes
Verify voltage is present and landed at equipment.	✓		DL	
Verify gas piping is complete and landed at each component. Inlet gas pressure to be between 7 in. wg and 14 in. wg.		✓	DL	
Verify field installed sensors installed.	✓		DL	
Verify control wiring installed and landed.	✓		DL	
Verify accessories installed.	✓		DL	
Check ductwork installed (all runs in place, final tie in complete).	✓		DL	
Check that drain lines are installed and properly terminated.			DL	
Verify Phase Monitor:		✓	DL	
Verify voltage on phase monitor.		✓	DL	
Check UC600 Setpoints:		✓	DL	
Verify Duct Static Pressure setpoint	✓		DL	
Verify Minimum OA Damper position	✓		DL	
Verify Maximum OA Damper position	✓		DL	
Verify Supply Air Flow Setpoint.	✓		DL	
Verify Exhaust Air Flow Setpoint.		✓	DL	
Identify Airflow Monitoring:	✓		DL	

Notes: BISD to provide FA wiring & Controls

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:		Signed:		Signed:	
Name:	Dean Lizzotte	Name:	Ray Ballesteros	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	10-17-24	Date:	10-17-24	Date:	
Phone/Emails:	dl: Dlizzotte@halff.com	Phone/Emails:	956-249-4207	Phone/Emails:	

*Initialing Authority

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Pre-Functional Checklist – Chilled Water Dedicated Outdoor Air System Unit

Job Name	BISD Aiken HVAC Renovation
Installation Location	OAU-9
Serial Number	---423070256
Model Number(s)	CAH0056VCM
A.V.O. Number(s)	

Chilled Water Outdoor Air Unit	Witnessed	N/A	Initials	See Notes
Verify voltage is present and landed at equipment.				
Verify gas piping is complete and landed at each component. Inlet gas pressure to be between 7 in. wg and 14 in. wg.				
Verify field installed sensors installed.				
Verify control wiring installed and landed.				
Verify accessories installed.				
Check ductwork installed (all runs in place, final tie in complete).				
Check that drain lines are installed and properly terminated.				
Verify Phase Monitor:				
Verify voltage on phase monitor.				
Check UC600 Setpoints:				
Verify Duct Static Pressure setpoint				
Verify Minimum OA Damper position				
rify Maximum OA Damper position				
Verify Supply Air Flow Setpoint.				
Verify Exhaust Air Flow Setpoint.				
Identify Airflow Monitoring:				

Notes: Rheat Contactor Clicking; Missing Accesspanel for OA damper

Halff Cx Agent
Signed*: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____
*Initialing Authority

General Contractors Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

Owners Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

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Pre-Functional Checklist – Chilled Water Dedicated Outdoor Air System Unit

Job Name	BISD Aiken HVAC Replacement
Installation Location	GAU-7
Serial Number	FB0423070252517
Model Number(s)	CAH00606VCM
A.V.O. Number(s)	45813.606

Chilled Water Outdoor Air Unit	Witnessed	N/A	Initials	See Notes
Verify voltage is present and landed at equipment.	✓		DL	
Verify gas piping is complete and landed at each component. Inlet gas pressure to be between 7 in. wg and 14 in. wg.		✓	DL	
Verify field installed sensors installed.	✓		DL	
Verify control wiring installed and landed.	✓		DL	
Verify accessories installed.	✓		DL	
Check ductwork installed (all runs in place, final tie in complete).	✓		DL	
Check that drain lines are installed and properly terminated.	✓		DL	
Verify Phase Monitor:		✓	DL	
Verify voltage on phase monitor.		✓	DL	
Check UC600 Setpoints:		✓	DL	
Verify Duct Static Pressure setpoint	✓		DL	
Verify Minimum OA Damper position	✓		DL	
Verify Maximum OA Damper position	✓		DL	
Verify Supply Air Flow Setpoint.	✓		DL	
Verify Exhaust Air Flow Setpoint.		✓	DL	
Identify Airflow Monitoring:	✓		DL	

Notes: missing pre-filter

Halff Cx Agent	General Contractors Representative	Owners Representative
Signed*:	Signed:	Signed:
Name: Dean L	Name: Ray Ballesteros	Name:
Company: Halff	Company:	Company:
Date: 9-11-24	Date:	Date:
Phone/Emails: dli@halff.com	Phone/Emails:	Phone/Emails:

*Initialing Authority

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Pre-Functional Checklist – Blower Coil Unit

Job Name	BISD Aiken HVAC Renovation
Installation Location	BCU - C108
AVO	45816-006
Serial Number	
Model Number(s)	

Fan Coil Unit	Witnessed	N/A	Initials	See Notes
Verify inlet and outlet duct lengths are approximately two- or three-wheel diameters long before and after the fan.				
Verify discharge is orientated in the same direction as originally ordered.				
Check all fasteners for tightness. Check the setscrews in the wheel hub (and pulleys, if applicable).				
Start the fan and shut it off immediately to check the rotation of the wheel				
Vibration Isolators: Make certain all connectors are tight and that all washers are in.				
Check pulley for proper alignment for BSQ-M Fans.		✓		
Notes:				

Halff Cx Agent
Signed*: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____
*Initialing Authority

General Contractors Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

Owners Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

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Pre-Functional Checklist – Blower Coil Unit

Job Name	BISD Aiken - HVAC Renovation
Installation Location	BCU-L03
AVO	45816.001
Serial Number	E0349503300
Model Number(s)	BC-H1.D.016

Fan Coil Unit	Witnessed	N/A	Initials	See Notes
Verify inlet and outlet duct lengths are approximately two- or three-wheel diameters long before and after the fan.	✓		DL	
Verify discharge is orientated in the same direction as originally ordered.	✓		DL	
Check all fasteners for tightness. Check the setscrews in the wheel hub (and pulleys, if applicable).	✓		DL	
Start the fan and shut it off immediately to check the rotation of the wheel	✓		DL	
Vibration Isolators: Make certain all connectors are tight and that all washers are in.	✓		DL	
Check pulley for proper alignment for BSQ-M Fans.		✓	DL	
Notes:				

Halff Cx Agent
Signed*: [signature]
Name: Dean Lizotte
Company: Halff
Date: 10-17-25
Phone/Emails: dlizotte@halff.com
*Initialing Authority

General Contractors Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

Owners Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	B218 2nd floor
Customer Order Number	
Model Number(s)	FD345030206
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.				
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify Incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).			✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	B218 2nd floor
Customer Order Number	
Model Number(s)	E03495 0302500
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: Miguel A. Guerra
Name: Miguel A. Guerra
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed: Martinez
Name: FRANK Martinez
Company: CMH2
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent		**General Contractors Representative**		**Owners Representative**	
Signed*:	Miguel A. García	Signed:		Signed:	
Name:	Miguel García	Name:	FRANK Martinez	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	B217 2nd floor
Customer Order Number	
Model Number(s)	FO34X030120
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all ~~460/208~~ voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).			✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	B217 2nd Floor
Customer Order Number	
Model Number(s)	E034P5030230O
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: Miguel A. Gonzalez
Name: Miguel Gonzalez
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed: F Martinez
Name: FRANK MARTINEZ
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:	Miguel Garcia	Signed:	Michael Flores Martinez	Signed:	
Name:	Miguel Garcia	Name:	Flores Martinez	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	3202 2nd floor
Customer Order Number	
Model Number(s)	EO3495030120O
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).			✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	B 202 2nd floor
Customer Order Number	
Model Number(s)	4034950302600
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: Miguel A. Garcia
Name: Miguel Garcia
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed:
Name: FRANK Martinez
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

halff

29.) Start unit.				
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:	Miguel Aguirre	Signed:	Mathew	Signed:	
Name:	Miguel Aguirre	Name:	FRANK Mathew	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initialing Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	B201 2nd Floor
Customer Order Number	
Model Number(s)	E03495030 2000
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all ~~460/208~~ 115 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.				
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).			✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	B201 2nd floor
Customer Order Number	
Model Number(s)	E03495030 2100
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: Miguel Garcia
Name: Miguel Garcia
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed:
Name: Frank Martinez
Company: CMS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent
Signed*: Miguel C.
Name: Miguel Cantu
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed:
Name: FRANK MARTINEZ
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	B101 1st floor
Customer Order Number	
Model Number(s)	E03495030 1600
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all ~~460/208~~ 115 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).			✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	B101 1st floor
Customer Order Number	
Model Number(s)	E03 49503 0220
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:	Miguel A. Vazquez	Signed:	Manuel	Signed:	
Name:	Miguel Angel Vazquez	Name:	FRANK Martinez	Name:	
Company:	Halff	Company:	CAES	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.				
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	-			
36.) Complete operating log and obtain required signature				
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:	Miguel Garza	Signed:	Frank Montez	Signed:	
Name:	Miguel Garza	Name:	Frank Montez	Name:	
Company:	Halff	Company:	CAH2	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	A107 1st floor
Customer Order Number	
Model Number(s)	E03495030130D
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			N/A	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			N/A	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			N/A	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			N/A	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).		✓		
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	A107 1st Floor
Customer Order Number	
Model Number(s)	E03495030240O
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: Miguel C. Guevara
Name: Miguel Guevara
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed:
Name: FRANK MARTINEZ
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
	Notes:			

Halff Cx Agent		General Contractor Representative		Owners Representative	
Signed*:	Miguel Cortez	Signed:		Signed:	
Name:	Miguel Cortez	Name:	FRANK Martinez	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	6/20/25	Date:	5/10/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	1st Floor A-108
Customer Order Number	
Model Number(s)	E034950 30400
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).	✓		✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	1st floor A-108
Customer Order Number	
Model Number(s)	E034950302300
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:	[signature]	Signed:	[signature]	Signed:	
Name:	Miguel Barrera	Name:	FRANK MATHEZ	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
	Notes:			

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:		Signed:		Signed:	
Name:	Michael Galvan	Name:	FRANK MATHEWS	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	1st Floor - BCU-C108
Customer Order Number	
Model Number(s)	ED34495030 1400
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓			
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).	✓		✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	1st floor - C108
Customer Order Number	
Model Number(s)	E034950302300
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.	✓		✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: [signature]
Name: Miguel Guerra
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed: [signature]
Name: FRANK MARTINEZ
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent		**General Contractors Representative**		**Owners Representative**	
Signed*:		Signed:		Signed:	
Name:	Miguel Garcia	Name:	FRANK MONTALVO	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initialing Authority

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	#38 BCU-C107 1st floor
Customer Order Number	
Model Number(s)	E03495030300 (part #) BC.H.D.016.1.A.L.N.Y.Y.Y.A.Y.N.N.Y.
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.			✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.			✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.			✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.			✓	
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).	✓		✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	1st Floor RM C107
Customer Order Number	
Model Number(s)	E03495030240O
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel	✓			
Verify proper drain tap installation			✓	
Check condensing fans for any damage or misalignment.	✓			
Inspect all coils within the unit.	✓		✓	
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.			✓	
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/			✓	
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: [signature]
Name: Miguel Gallegos
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed: [signature]
Name: FRANK Martinez
Company: CATS
Date: 5/20/25
Phone/Emails: [signature]

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

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29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.	✓			
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent	General Contractors Representative	Owners Representative
Signed*: Nigel Gareth	Signed:	Signed:
Name: Nigel Gareth	Name: FRANK MARTINEZ	Name:
Company: Halff	Company: CAHS	Company:
Date: 5/20/25	Date: 5/20/25	Date:
Phone/Emails:	Phone/Emails:	Phone/Emails:
*Initiating Authority		

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Pre-Functional Checklist – Air Handler Unit

Job Name	
Installation Location	#30 BCU-B111
Customer Order Number	
Model Number(s)	*BCHA054ARD030C3C2011B01000A0000000W000
G.O. Number(s)	

	Yes	No	N/A	Initials
1.) Make sure the unit is level to the pad and all shims are under each section correctly.	✓			
2.) Disconnect all 460/208 voltage and perform lock-out / tag-out.	✓			
3.) Review inside trim make sure that it's done and sealed. Unit exterior; inspected outside trim; check for damage, inspect paint, and that all doors open properly.	✓			
4.) Check external power outlets for correct polarity.			✓	
5.) Ensure supply-air and return-air ducts have been connected.	✓			
6.) On steam supplied 'Wing coils' inspect adjustment on clam shells to 2mm gap or less, make sure damper linkage IA installed properly Review if damper fail open or close, if it goes off on a safety.			✓	
7.) Inspect the entire motor for signs of rust and corrosion. If evidence of rust in motor exists check motor winding by verifying a winding resistance of >6 meg-ohms (if lower, dry out winding and re-test).	✓			
8.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
9.) Verify all the unit wiring connections are tight at the motor, disconnect, and VFDS. Measure for correct incoming voltage on all three legs, check for phasing.	✓			
10.) Verify damper operation; make sure damper move freely and do not bind and linkage alignment moves freely.	✓		✓	
11.) Ensure all air unit filters (including Hepa if equipped) are in place and properly positioned within the unit and tight using the correct filter retainers and the filters air flow is in the right direction.	✓			
12.) Verify the freeze stat is operational by placing in an ice bath or use of a compatible method for bringing the temp. down.	✓		✓	
13.) All unit drain lines and traps properly installed; (review trap size and static) also check for operation and leaks.	✓			
14.) Check drain pans, opening, and condensate line for obstructions, check upper drain pan piping so it is hitting lower dan pan.	✓		✓	
15.) Visually inspect all piping and valves for any apparent signs of leakage.	✓			
16.) When applicable for steam coils, turn steam on full for a minimum of 10 minutes prior to opening the fresh air.			✓	
17.) All coil fins inspected and straightened.	✓			
18.) Verify hold down bolts and channels from fan sections are removed if internally isolated (if not, notify contractor to correct) Review isolation spring and adjust as needed. Inspect for tears and loose screw on the flex connection.	✓			
19.) Inspect all fan wheels to confirm proper rotation direction and move freely by gaining access through removal of wire.	✓			
20.) Verify proper torque to the shaft bearings, fan wheel, and drive sheave set screws.	✓			
21.) Verify all fan belts are properly tensioned after confirming the sheaves are in proper alignment (see O.M.).			✓	
22.) Inspect the fan motor bearings and blower bearings for proper lubrication ensuring no moisture is present.			✓	
23.) If excessive vibration exists ensure unit vibration is tested to not exceed 6% of original designed speed.			✓	
24.) Prior to start-up, bump-start the unit to confirm fan wheel rotates as indicated by the arrow located on fan housing.	✓			
25.) Verify incoming voltage imbalance is <2%.	✓			
26.) Close and secure all access doors.	✓		✓	
27.) Check mechanical drawing for static operating pressure (if not available, confirm with associated sales engineer).			✓	
28.) Listen for vibration, noise, or signs of overheating (bearings may run hot during break-in).	✓			

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Pre-Functional Checklist – Dedicated Outdoor Air System

Job Name	
Installation Location	B-111
Customer Order Number	
Model Number(s)	*E034950302200
G.O. Number(s)	

	Yes	No	N/A	Initials
Disconnect and lock-out all power switches	✓			
Remove any foreign objects that are located in the unit	✓			
Check all fasteners, set screws, and locking collars on the fans, bearing	✓			
Rotate the fan wheels and energy recovery wheels (if applicable) by hand and ensure no part are rubbing.			✓	
Verify that non-motorized dampers open and close properly.	✓			
Check the tightness of all factory wiring connections.	✓			
Verify control wire gauge	✓			
Verify diameter seal settings on the energy recovery wheel			✓	
Verify proper drain tap installation	✓			
Check condensing fans for any damage or misalignment.			✓	
Inspect all coils within the unit.	✓			
If there is an indirect gas-fired furnace in this unit, refer to the manual provided with the unit for prestart-up information.		✓		
The unit contains a crankcase heater for each compressor which needs power supplied to it 24 hours prior to start-up/		✓		
Supply air temperature sensor is installed in ductwork and wired back to unit controller.	✓			
Room temperature and humidity sensor is installed and wired back to unit controller	✓			

Halff Cx Agent
Signed*: Miguel Gaytan
Name: Miguel Gaytan
Company: Halff
Date: 5/30/25
Phone/Emails:
*Initiating Authority

General Contractors Representative
Signed:
Name: Frank Mathews
Company: CAHS
Date: 5/30/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

halff

29.) Start unit.	✓			
30.) Fan amperages within nameplate specs.	✓			
31.) Inspect for all installing hardware and trim pieces.	✓			
32.) Verify linkage operation on Wing coils along with piping and piping components.	✓			
33.) Verify sequence of operation on Humidifiers and compare existing piping to recommendations in IOM.			✓	
34.) Check operation of High Static limit switch and/or relief doors/dampers during startup.			✓	
35.) Recheck safety grating over floor opening for correct installation and being secured properly.				
36.) Complete operating log and obtain required signature	✓			
37.) Record all model, serial, and sales number from unit. Record all numbers from motors, wing coils. Record all filter sizes and total numbers	✓			
Notes:				

Halff Cx Agent		General Contractors Representative		Owners Representative	
Signed*:	Miguel Chavez	Signed:	Matthez	Signed:	
Name:	Miguel Chavez	Name:	FRANK MARTINEZ	Name:	
Company:	Halff	Company:	CAHS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Variable Frequency Drive

Job Name	
Installation Location	PUMP ROOM PUMP #1
Customer Order Number	
Model Number(s)	[redacted] 7IBIB021TD / 01613ET3E21ST3
G.O. Number(s)	CIMP-7U4AC021FAA S# 10806317 80

Motor Information	Witnessed	N/A	Initials
SF 1.15			FM
HP 10			FM
Amps [redacted] 14.4/12.2			FM
Voltage 230/460			FM
RPM 1760			FM
PF 0.84			FM

Electrical/Mechanical	Yes	No	N/A	Initials
All hardware, electrical, and mechanical connections tight	✓			FM
VFD motor rotation check	✓			FM
Bypass (if no reason)	✓			FM

Electrical Start-Up (measurements at full speed)	Phase A	Phase B	Phase C	Initials
VFD motor rotation check	YES			
By-pass current	12.2	12.2	12.2	
Display current				

Voltage	L1-L2	L2-L3	L3-L1	Initials
AC Input voltage	484.7	488.8	488.7	FM

Software	Version	Initials
Software Version		

Miscellaneous	Yes	No	N/A	Initials
Is the VFD properly fused per the manual	✓			FM
Is the VFD mounted per Installation Manual instructions	✓			FM
Are all control wires present and terminated	✓			FM
What type of follower: (check one) 0-10 VDC () 4 to 20 mA () PID () Other () None ()				FM

Notes:

Halff Cx Agent
Signed*: Miguel Garcia
Name: Miguel Garcia
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractor Representative
Signed:
Name: FRANK MARTINEZ
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

VFD #3
S/N 7502004154

PUMP #3
CAT # EM2333T
SPEC - G9PC11T597G1

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Pre-Functional Checklist – Variable Frequency Drive

Job Name	
Installation Location	PUMP ROOM
Customer Order Number	
Model Number(s)	CIMR-2U4A0021FAA / pump #2 / 0101187ET3E215T-S
G.O. Number(s)	S/N 1077266K165

Motor Information		Witnessed	N/A	Initials
SF	1.15			
HP	10			
Amps	24.4/12.2			
Voltage	230/460			
RPM	1760			
PF	0.84			

Electrical/Mechanical	Yes	No	N/A	Initials
All hardware, electrical, and mechanical connections tight				
VFD motor rotation check				
Bypass (if no reason)				

Electrical Start-Up (measurements at full speed)	Phase A	Phase B	Phase C	Initials
VFD motor rotation check				
By-pass current				
Display current				

Voltage	L1-L2	L2-L3	L3-L1	Initials
AC Input voltage				

Software	Version	Initials
Software Version		

Miscellaneous	Yes	No	N/A	Initials
Is the VFD properly fused per the manual				
Is the VFD mounted per Installation Manual instructions				
Are all control wires present and terminated				
What type of follower: (check one) 0-10 VDC () 4 to 20 mA () PID () Other () None ()				

Notes: MOTOR HAS A TAG PUMP #2

Halff Cx Agent		General Contractor Representative		Owners Representative	
Signed*:	Miguel G. Jr.	Signed:		Signed:	
Name:	Miguel Contreras	Name:	FRANK MARTINEZ	Name:	
Company:	Halff	Company:	CDAS	Company:	
Date:	5/20/25	Date:	5/20/25	Date:	
Phone/Emails:		Phone/Emails:		Phone/Emails:	

*Initiating Authority

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Pre-Functional Checklist – Variable Frequency Drive

Pump #4

Job Name	
Installation Location	
Customer Order Number	Cat. No./EM2333T
Model Number(s)	M16U2400/SW750100Y154 Spec 09P011T597G1
G.O. Number(s)	

Motor Information	Witnessed	N/A	Initials
SF			
HP			
Amps			
Voltage			
RPM			
PF			

Electrical/Mechanical	Yes	No	N/A	Initials
All hardware, electrical, and mechanical connections tight				
VFD motor rotation check				
Bypass (if no reason)				

Electrical Start-Up (measurements at full speed)	Phase A	Phase B	Phase C	Initials
VFD motor rotation check				
By-pass current				
Display current				

Voltage	L1-L2	L2-L3	L3-L1	Initials
AC Input voltage				

Software	Version	Initials
Software Version		

Miscellaneous	Yes	No	N/A	Initials
Is the VFD properly fused per the manual				
Is the VFD mounted per Installation Manual instructions				
Are all control wires present and terminated				
What type of follower: (check one) 0-10 VDC () 4 to 20 mA () PID () Other () None ()				

Notes: Not working

Halff Cx Agent
Signed*: Miguel Garcia
Name: Miguel Garcia
Company: Halff
Date: 5/20/25
Phone/Emails:
*Initiating Authority

General Contractor Representative
Signed:
Name: FRANK Martinez
Company: CAHS
Date: 5/20/25
Phone/Emails:

Owners Representative
Signed:
Name:
Company:
Date:
Phone/Emails:

halff

Graphics Review

Introduction

The purpose of the graphics review is to align the Controls Subcontractor with the Owner's project requirements. The review shall examine the general aesthetics of the BAS system, verification that all the equipment is readily available, and reporting accuracy. The graphics review requires the CxA to receive access to the BAS during and after installation.

Communication

Documentation for pre-graphics review is attached. The documents after the competition shall be signed by the CxA, Owner's representative, and Contractor representative. An example of a Issues and Resolutions Log is also attached.

Procedures

1. Access to the project's BAS
2. Analysis shall be performed for any graphical glitches or major issues.
3. The individual views shall be compared against the installed schedules to verify if all the proper equipment is on the screen.
4. The information on the BAS shall be compared to the information from the installed equipment itself or if available testing instrumentation.
5. The alarms shall then be tested to verify proper setup.
6. Any identified issues shall be documented in the Issues and Resolutions Log.
7. If resolved the building automation system shall be reviewed once more.
8. When the review has been completed the document shall be signed by the witnessing parties including up to the CxA, the Owner's representative, and the Contractor's representative.

Notes: The CxA shall need remote access to the BAS during and after the graphics review.

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Unit Status

Date: 9/16/2024

AVO: 45813.01

Project: BISD Esser Aiken Elementary

Contract for: Brownsville ISD

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Unit	LOCATION	FAN COMMAND (START / STOP)	FIRE ALARM CONTACT (THROUGH RIB RELAY)	CURRENT STATUS (SUPPLY FAN)	OVERFLOW DRAIN PAN (FLOAT SWITCH)	CHILLED WATER CONTROL VALVE COMMAND (0-10VDC)	RE-HEAT ELECTRIC SCR COMMAND (0-10VDC)	ECM FAN COMMAND (0-10VDC) 0 - 100% SPEED	ZONE TEMPERATURE SENSOR (WALL MOUNT) (°F)	ZONE HUMIDITY SENSOR (WALL MOUNT) (%RH)	COOLING COIL TEMPERATURE (PROBE) (°F)	DISCHARGE AIR TEMP (PROBE) (°F)
BCU-A101	1ST FLOOR											
BCU-A102	1ST FLOOR											
BCU-A103	1ST FLOOR											
BCU-A104	1ST FLOOR											
BCU-A105	1ST FLOOR											
BCU-A106	1ST FLOOR											
BCU-A107	1ST FLOOR											
BCU-A108	1ST FLOOR											

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Unit	LOCATION	FAN COMMAND (START / STOP)	FIRE ALARM CONTACT (THROUGH RIB RELAY)	CURRENT STATUS (SUPPLY FAN)	OVERFLOW DRAIN PAN (FLOAT SWITCH)	CHILLED WATER CONTROL VALVE COMMAND (0-10VDC)	RE-HEAT ELECTRIC SCR COMMAND (0-10VDC)	ECM FAN COMMAND (0-10VDC) 0 - 100% SPEED	ZONE TEMPERATURE SENSOR (WALL MOUNT) (°F)	ZONE HUMIDITY SENSOR (WALL MOUNT) (%RH)	COOLING COIL TEMPERATURE (PROBE) (°F)	DISCHARGE AIR TEMP (PROBE) (°F)
BCU-B100	1ST FLOOR											
BCU-B101	1ST FLOOR											
BCU-B102	1ST FLOOR											
BCU-B103	1ST FLOOR											
BCU-B104	1ST FLOOR											
BCU-B105	1ST FLOOR											
BCU-B106	1ST FLOOR											
BCU-B107	1ST FLOOR											
BCU-B108	1ST FLOOR											
BCU-B109	1ST FLOOR											
BCU-B110	1ST FLOOR											
BCU-B111	1ST FLOOR											
BCU-B112	1ST FLOOR											
BCU-C101	1ST FLOOR											
BCU-C102	1ST FLOOR											

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Unit	LOCATION	FAN COMMAND (START / STOP)	FIRE ALARM CONTACT (THROUGH RIB RELAY)	CURRENT STATUS (SUPPLY FAN)	OVERFLOW DRAIN PAN (FLOAT SWITCH)	CHILLED WATER CONTROL VALVE COMMAND (0-10VDC)	RE-HEAT ELECTRIC SCR COMMAND (0-10VDC)	ECM FAN COMMAND (0-10VDC) 0 - 100% SPEED	ZONE TEMPERATURE SENSOR (WALL MOUNT) (°F)	ZONE HUMIDITY SENSOR (WALL MOUNT) (%RH)	COOLING COIL TEMPERATURE (PROBE) (°F)	DISCHARGE AIR TEMP (PROBE) (°F)
BCU-C103	1ST FLOOR											
BCU-C104	1ST FLOOR											
BCU-C105	1ST FLOOR											
BCU-C106	1ST FLOOR											
BCU-C107	1ST FLOOR											
BCU-C108	1ST FLOOR											
BCU-LOBBY	1ST FLOOR											
BCU-T.LOUNGE	1ST FLOOR											
BCU-NURSE	1ST FLOOR											
BCU-ADMIN	1ST FLOOR											
BCU-PRINCIPAL	1ST FLOOR											
BCU-COUNSELORS	1ST FLOOR											
BCU-OFFICE	1ST FLOOR											
BCU-DIAG	1ST FLOOR											
BCU-B201	2ND FLOOR											

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Unit	LOCATION	FAN COMMAND (START / STOP)	FIRE ALARM CONTACT (THROUGH RIB RELAY)	CURRENT STATUS (SUPPLY FAN)	OVERFLOW DRAIN PAN (FLOAT SWITCH)	CHILLED WATER CONTROL VALVE COMMAND (0-10VDC)	RE-HEAT ELECTRIC SCR COMMAND (0-10VDC)	ECM FAN COMMAND (0-10VDC) 0 - 100% SPEED	ZONE TEMPERATURE SENSOR (WALL MOUNT) (°F)	ZONE HUMIDITY SENSOR (WALL MOUNT) (%RH)	COOLING COIL TEMPERATURE (PROBE) (°F)	DISCHARGE AIR TEMP (PROBE) (°F)
BCU-B202	2ND FLOOR											
BCU-B203	2ND FLOOR											
BCU-B204	2ND FLOOR											
BCU-B205	2ND FLOOR											
BCU-B206	2ND FLOOR											
BCU-B207	2ND FLOOR											
BCU-B208	2ND FLOOR											
BCU-B209	2ND FLOOR											
BCU-B210	2ND FLOOR											
BCU-B211	2ND FLOOR											
BCU-B212	2ND FLOOR											
BCU-B213	2ND FLOOR											
BCU-B214	2ND FLOOR											
BCU-B215	2ND FLOOR											
BCU-B216	2ND FLOOR											

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Unit	LOCATION	FAN COMMAND (START / STOP)	FIRE ALARM CONTACT (THROUGH RIB RELAY)	CURRENT STATUS (SUPPLY FAN)	OVERFLOW DRAIN PAN (FLOAT SWITCH)	CHILLED WATER CONTROL VALVE COMMAND (0-10VDC)	RE-HEAT ELECTRIC SCR COMMAND (0-10VDC)	ECM FAN COMMAND (0-10VDC) 0 - 100% SPEED	ZONE TEMPERATURE SENSOR (WALL MOUNT) (°F)	ZONE HUMIDITY SENSOR (WALL MOUNT) (%RH)	COOLING COIL TEMPERATURE (PROBE) (°F)	DISCHARGE AIR TEMP (PROBE) (°F)
BCU-B217	2ND FLOOR	X	X	X	X	X	X	X	X	X	X	X
BCU-B218	2ND FLOOR	X	X	X	X	X	X	X	X	X	X	X
BCU-ASST	2ND FLOOR	X	X	X	X	X	X	X	X	X	X	X
BCU-LOUNGE/IT	2ND FLOOR	X	X	X	X	X	X	X	X	X	X	X
BCU-HALL	2ND FLOOR	X	X	X	X	X	X	X	X	X	X	X

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Unit Status

Date: 9/16/2024

AVO: 45813.01

Project: BISD Esser Aiken Elementary

Contract for: Brownsville ISD

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

EXAUST FAN	FAN START/STOP COMMAND	FAN STATUS (CURRENT SENSOR SWTICH)	FAN FAIL ALARM
EF-1			
EF-2			
EF-3			
EF-4			
EF-5			
EF-6			
EF-7			
EF-8			

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EXAUST FAN	FAN START/STOP COMMAND	FAN STATUS (CURRENT SENSOR SWTICH)	FAN FAIL ALARM
EF-9			
EF-10			
EF-11			
EF-12			
EF-13			
EF-14			
EF-15			
EF-16			
EF-17			
EF-18			
EF-19			
EF-20			

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Aiken Elementary Summary Data			
UNIT	TEMPERATURE (F)	RH %	DEW POINT
BCU-A101	71.2	66	59.13
BCU-A102	71.9	60	57.33
BCU-A103	70	58	54.62
BCU-A104	70.3	60	55.83
BCU-A105	75	77	67.33
BCU-A106	71	68	59.97
BCU-A107	73.8	62	60.03
BCU-A108	69.7	63	56.62
BCU-B100	66	67	54.8
BCU-B101	67.8	62	54.38
BCU-B102	70.2	68	59.2
BCU-B103	66	65	53.97
BCU-B104	68	64	55.44
BCU-B105	67	64	54.49
BCU-B106	65.4	67	54.23
BCU-B107	66.1	68	55.3
BCU-B108	65.9	78	58.9
BCU-B109	68	73	59.08
BCU-B110	66.4	75	58.3
BCU-B111	68.5	67	57.18
BCU-B112	66.9	70	56.86
BCU-C101	68.6	68	57.68
BCU-C102	70	57	54.14
BCU-C103	67.6	62	54.19
BCU-C104	69.3	67	57.94
BCU-C105	69.5	66	57.71
BCU-C106	71.2	62	57.58
BCU-C107	71.2	65	58.8
BCU-C108	72.1	61	57.98
BCU-LOBBY	73.1	71	63.18
BCU-T.LOUNGE	70.2	67	58.79
BCU-NURSE	68.7	72	59.37
BCU-ADMIN	69.5	67	58.13
BCU-PRINCIPAL	70.5	63	57.36
BCU-COUNSELORS	70.3	72	60.9
BCU-OFFICE	69.7	66	57.9
BCU-DIAG	72.5	56	55.98
BCU-B201	69.6	67	58.22
BCU-B202	65	69	54.65
BCU-B203	71	62	57.39
BCU-B204	67.6	68	56.73
BCU-B205	69.3	64	56.67
BCU-B206	70.3	59	55.37
BCU-B207	68.1	77	60.67
BCU-B208	71.2	59	56.21
BCU-B209	67.9	70	57.82
BCU-B210	69.3	69	58.75
BCU-B211	68	61	54.12
BCU-B212	67.4	68	56.54
BCU-B213	69.7	59	54.81
BCU-B214	70.7	59	55.74
BCU-B215	69.7	59	54.81
BCU-B216	71.1	57	55.17
BCU-B217	63.5	72	54.38
BCU-B218	70.5	57	54.61
BCU-ASST	70.4	60	55.92
BCU-LOUNGE/IT	65.9	65	53.87
BCU-HALL	71.7	82	65.95

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Graphics Review

Job Name	Esser Aiken Elementary		
	Yes	No	Initials
Are all the VFD's displayed on the screen?		X	
Are all dedicated outside air systems displayed on the screen?	X		
Are all pumps displayed on the screen?	X		
Are all chillers displayed on the screen?	X		
Are the all the fan arrays displayed on the screen?	X		
Are all roof top units displayed?	X		
Are all boilers displayed on the screen?		X	
Are all water coils displayed on the screen?	X		
Are all flow rates displayed on the screen?	X		
Are all pressures displayed on the screen?	X		
Are all maintenance reminders displayed on the screen?	X		
Do the graphics make sense for the general user?	X		
Do all the alarms display accurately and prominently?	X		

Notes:

Halff Cx Agent
Signed*: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____
**initialing Authority*

General Contractors Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

Owners Representative
Signed: _____
Name: _____
Company: _____
Date: _____
Phone/Emails: _____

Sequence of Operations Review and Verification

Introduction

The purpose of the sequence of operations review is to verify that the equipment functions normally during intended conditions. The SOO review and data logger confirmation must be performed after TAB and controls subcontractors have concluded their work.

Communication

The documents after the completion shall be signed by the CxA, the Owner's representative, and the Contractor representative. The Issues and Resolution Log is attached.

Procedures

1. First, a sample of equipment is taken from the schedule.
2. The controls sequences for the selected sample are tested and verified per the Construction Documents.
3. The data collected shall span a month after the completion of the SOO review.
4. The CxA shall review the data from the BAS and the CxA data loggers for the same areas to ensure the HVAC system stability.

Brownsville Independent School District

Agenda Category: Bids / Proposals **Board of Education Meeting:** 09/13/2022

Item Title: CSP #23-155 ESSER Aiken ES HVAC Upgrades, Phase 1 (Package 2) Project

X Action
____ Information
____ Discussion

BACKGROUND:

On August 18, 2022, BISD Purchasing Department received and opened bid packages from one (1) vendor for CSP #23-155 ESSER Aiken ES HVAC Upgrades, Phase 1 (Package 2) project. On August 19, 2022, the ranking committee members evaluated the one (1) qualified vendor and selected Central Air and Heating Service, Inc. (CAHS) of Harlingen, Texas, which has received the highest-ranking scores and is recommended for the Construction Services. Administration recommends approving Central Air and Heating Service, Inc. for Construction Services for the project as mentioned above in the amount not to exceed $3,400,000.00. The construction project is scheduled to achieve substantial completion in two hundred fifteen (215) days contingent upon equipment delivery from the Notice to Proceed date. For reference, please find the attached documents as follows:

- Department Recommendation Forms
- The Bid Tabulation Sheet
- The average ranking scores for the one (1) competitive sealed proposal received
- The bid opening report received from submitted vendors
- Agenda – Project Authorization and Delivery method from Board of Trustees

FISCAL IMPLICATIONS:

ESSER III Fund 282 – $3,400,000.00

RECOMMENDATION:

Recommend awarding of CSP #23-155 ESSER Aiken ES HVAC Upgrades, Phase 1 (Package 2) project to Central Air and Heating Service, Inc. (CAHS) of Harlingen, Texas in the amount not to exceed $3,400,000.00, to authorize the Administration to enter negotiations, and to execute the contract. ESSER III Fund 282.

Fernando E Villarreal / Rosario Peña
Submitted by: Principal / Purchasing Director

Manuel Hinojosa, FAIA / David Robledo
Recommended by: District Architect / CFO

Dr. Nellie Cantu
Approved by: Deputy Superintendent 9-8-22

Approved for Submission to Board of Education:

Dr. René Gutiérrez
Superintendent

When Necessary, Additional Background May Follow This.