

**ADDENDUM NO. 2**

**DATE:** August 22, 2025

**PROJECT:** UNCCH Phillips Hall 1958 HVAC Renovation  
SCO ID # 22-25029-02A  
UNC CIP # 21400

**OWNER:** University of North Carolina at Chapel Hill  
Giley Horney Building  
103 Airport Dr. Chapel Hill, NC 27599

**ENGINEER:** Dewberry Engineers Inc.  
2610 Wycliff Road, Suite 410, Raleigh, NC 27607

This Addendum, applicable to the work designated herein, shall be understood to be (and is) an Addendum to the contract documents and, as such, shall become part of and included in the contract.

1. Please see attached revised August 13, 2025, Preferred Brand Alternate Meeting Sign-in sheets. Some email addresses were entered incorrectly.
2. Please see attached revised August 13, 2025, Pre-Bid Meeting Minutes. The Pre-Bid Meeting Sign-in sheets. Some email addresses were entered incorrectly.
3. Revision - Prior Addendum referenced Division 23 section 230960 – BAS Operator Interface. See corrected section label. Please reference the Division 23 – 239060 – BAS Operator Interface section of the Project Manual as this section has been added.
4. The Blower Coil Unit Schedule note #1 states to refer to specification section 23 73 16 for additional requirements, which corresponds to the Air Handling Units. This shall be revised to specification section 23 73 11 for Blower Coil Units. This will be added to the Project Manual.
5. Specification Section 23 82 19 – Fan Coil Units has been added. This will be added to the Project Manual.
6. Please find the following questions and responses files attached to the end of this Addendum #2:

Attached:

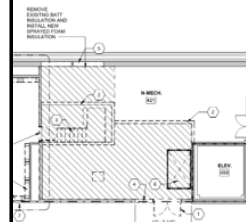
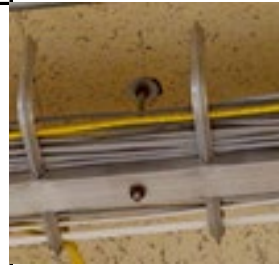
1. Appendix A - RFI Questions and responses.
2. Updated August 13, 2025 Pre-Bid Meeting Minutes with Sign-In Sheets
3. Updated August 13, 2025 Preferred Brand Pre-Bid Meeting Minutes with Sign-In Sheets.
4. Revised P-Sheets: 2025.08.22 - UNC Phillips Hall HVAC Upgrade - Addendum #2 - Plumbing Revisions.
5. Division 23 – 23 73 11 Blower Coil Units.
6. Division 23 – 23 82 19 Fan Coil Units

**End of Addendum No. 2**

**Appendix A – RFI Questions and Responses.**

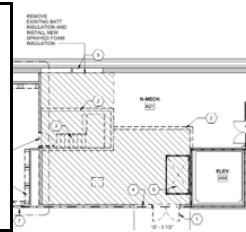
**UNCCH Phillips Hall 1958 RFI Log**

Question	Discipline	Date Received	Response
For the corridor walls that are being painted are we to paint all the door frames as well?	Architectural	8/15/2025	No, Doors and Frames are to remain as is.
For the corridor walls are we painting the glazed block or just the block above the glazed block?	Architectural	8/15/2025	Paint just the block above the glazed block.
For the new masonry walls are we to match the green glazed CMU block that is currently in the building? If so, do you have a spec for it?	Architectural	8/15/2025	Yes, match existing condition, please see below link (basis of design) and provide submittal and sample for approval of material to match. <a href="https://www.westbrookblock.com/resources/#toggle-id-1">https://www.westbrookblock.com/resources/#toggle-id-1</a>
It appears there is conduit attached to some of the 1x1 ceiling tile that we are demoing. Does the conduit rely on the 1x1 ceiling or is it attached from above? If it relies on the 1x1 ceiling can a drawing be provided showing where this conduit is and how we should reattach it?	Electrical	8/15/2025	Conduit is existing to remain and is attached by bolt to structure above.
Can you verify that none of the walls we are demoing are load bearing?	Structural	8/15/2025	Existing walls that are to be demolished are not load bearing.
The demo RCP calls for us to demo and reinstall existing ACT in several areas however the new RCP calls for us to install new ACT in these areas. Can you verify if we are to reinstall the existing or provide new?	Architectural	8/15/2025	Reinstall existing ACT with the exception of Room 265 and Room 365, these will have new installed.
Drawing A101 note 5 calls out partition type "U2" detailed on A601. I do not see a type U2 on this sheet. Can you clarify?	Architectural	8/15/2025	Reference Sheet A-601 U = UL #U415 W = UL #U905 J= UL #U425
The drawings call out several walls as "W", "J", "U".... I do not see these called out in the partition schedule. Can you verify?	Architectural	8/15/2025	Reference Sheet A-601 U = UL #U415 W = UL #U905 J= UL #U425
What is the new wall type separating classroom 265 from N-Mech 263?	Architectural	8/15/2025	Reference Sheet A-601 J= UL #U425
Theres a note on A-104 that states to remove batt insulation and install new sprayed foam. Can you clarify where this is needed?	Architectural	8/15/2025	Hatch area denote extents for insulation work.
072100 - There is no spec section for new Spray Foam Insulation. Please confirm type and thickness of spray foam insulation.	Architectural	8/14/2025	Spec attached.



**UNCCH Phillips Hall 1958 RFI Log**

Question	Discipline	Date Received	Response
AD-104 - Does the diagonal lined area on drawing AD-104 distinguish the location of spray foam insulation?	Architectural	8/14/2025	Hatch area denote extents for insulation work.
G-003 - Please clarify note 30 on construction plan which does not have a description in the notes	Mechanical	8/14/2025	On sheet G-003, key notes marked for note #29 shall refer to note #28 for storm water inlets and key notes marked #30 shall refer to note #29 for proposed crane location.
PD-111 & PD-112 - On P112, note 3 states to have the plumber provide a line item in their pricing for nitrogen piping. The bid form does not have a place to distinguish this value as a separate line item. Please revise the bid form to reflect the intent here.	Plumbing	8/14/2025	Refer to revised P-112 for defined scope. No line item unit pricing will be required.
AD-621 - Note 7 on AD-621 states to remove, protect and preserve lighting for reinstallation; this condition occurs in the office spaces. However, on the RCP plans (I-621), these same areas indicate to install new light fixtures (note 6). Please confirm whether these areas are to receive new light fixtures or to reuse existing.	Architectural	8/14/2025	Replace lighting is provided in ALT #7 – Office Lighting Replacement. Defer to UNC to provide decision on ALT.
AD-622 - Lastly, in the ACT going in rooms with plaster ceilings and no demo, is the design intent to have the ACT hanging off the existing plaster? Example: keynote 6 on AD-622 in room 164.	Architectural	8/14/2025	Yes, design intent is to hang from existing ceiling.
081113 - Please provide spec section 081113 "Hollow Metal Doors and Frames".	Architectural	8/14/2025	Spec attached.
A-605 - Door material type SCWV is referenced on the door schedule, but there is no indication as to what this material is. Please confirm if this is in reference to the flush wood door spec, or if this is another material.	Architectural	8/14/2025	Yes, SCWV is for the flush wood doors.
Can the prebid sign in sheet with contact information be shared?	PM	8/14/2025	Yes, it was sent with Addendum #1 on 8/18/2025.
1/S001 - Please provide the shoring requirements from the structural engineer, regarding the openings created for new AHUs. If the intent is for this to be delegated design, please clarify this	Structural	8/14/2025	All shoring required for this project shall be delegated design.
A-601 - Floor plans show tags labeled "J" "U" and "W". Please clarify if these match with the partition types on A-601.	Architectural	8/14/2025	Reference Sheet A-601 U = UL #U415 W = UL #U905 J= UL #U425
Can another jobsite walk be scheduled?	PM	8/14/2025	Yes, but will have to be scheduled with Dewberry and UNC-CH.
I-605 & I-610 - Room 420A calls for LVT-1 on drawing I-605 and finish schedule, however calls for Knitex carpet on I-160. Please clarify the floor type.	Architectural	8/14/2025	Please proceed with LVT-1 Flooring.



**UNCCH Phillips Hall 1958 RFI Log**

Question	Discipline	Date Received	Response
Discrepancy in SS construction: spec 2.2.A – SS interior liner only at the cooling coil ; spec 2.2.a.2 – SS entire unit interior. Dewberry to confirm entire interior should be SS and not just the CC section only.	Mechanical	8/18/2025	Specification 23 72 16, 2.2.A.2 states the interior lining for all AHU sections shall be 18-gauge stainless steel.
Discrepancy in fan qty: spec 2.3.F - minimum of 3 fans, but schedule for AHU-5 has 2 scheduled. Confirm two fans is acceptable	Mechanical	8/18/2025	Specification 23 72 16, 2.3.F states that fan arrays shall have at least three (3) fans, which conflicts with the Air Handling Unit Schedule that states 2 fans for AHU-5. The Air Handling Unit Schedule shall take priority for fan quantities.
Qty VFDs per array? Please clarify. One VFD/fan, One VFD/two fans?	Mechanical	8/18/2025	As stated in the Air Handling Unit Schedule, one (1) VFD shall be provided per fan.
See attached Mechanical controls diagram.(Pg. M-602 of mech plans) Please have the engineer box in the applicable sections of the drawing relevant to the AHU scope. The relief fans external to the units are shown as part of the diagram, and there are sensors (return temp, return humidity, etc...) to be confirmed as part of the AHU scope OR controls scope? Diagram attached for reference.	Mechanical	8/18/2025	The Mechanical Contractor will be responsible for providing the complete Division 23 installation and has the authority to determine how the materials and labor are sub-divided amongst their suppliers and sub-contractors. The BAS controls sub-contractor typically provides all work, including sensors and devices, specified in Sections 23 90 00 through 23 92 10. Equipment suppliers typically provide all components specified in applicable equipment sections. Please note Section 23 90 10 includes control valves and control dampers, although they reference other sections for more detail. Variable speed drives are not listed under Section 23 90 10 and are typically supplied by a separate supplier per Section 23 05 14, 1.3.B, with some exceptions.
We believe that the edited section in Division 02 is 02 82 00 - Asbestos Removal. We see that this section has changes and is only 27 pages now. Please confirm that this is the only section in Division 02 that has changed.	Hazardous Mat	8/21/2025	Yes, the number of pages were reduced.
There are 5 spec sections in Division 23 dealing with BAS. We are not seeing a new spec in the revised project manual for 23 09 60 - BAS Operator Interface. It likely should have a spec number of 23 90 60?? Please confirm. Has any of the original 5 changed?	Mechanical	8/21/2025	Spec section 239060 BAS Operator Interface was added. 230960 was a typo in the Addendum #1 and will be addressed in Addendum #2 to be 239060. All other Division 23 sections remained unchanged.



Engineers  
Planners  
Surveyors

## Pre-Bid Sign-In Sheet

Dewberry Engineers Inc.  
2610 Wycliff Road, Suite 410  
Raleigh, North Carolina 27607-3073

(919) 881-9939 Phone  
(919) 881-9923 Fax

**Project:** UNCCH Phillips Hall 1958 HVAC Renovations

**Dewberry Project No:** 50180848

**SCO ID #:** 22-25029-02A

**Date/Time:** August 13, 2025 / 10:00am

**Subject:** Pre-Bid Meeting

<b>Name</b>	<b>Company</b>	<b>Phone #</b>	<b>Email</b>
<u>John Rocan</u>	<u>JR Mechanical</u>	<u>704-248-8378</u>	<u><a href="mailto:jrocan@jrmechanical.com">jrocan@jrmechanical.com</a></u>
<u>Lisa Biehle</u>	<u>Messer Construction</u>	<u>513-978-2856</u>	<u><a href="mailto:lbiehle@messer.com">lbiehle@messer.com</a></u>
<u>Kevin Rose</u>	<u>WATCO</u>	<u>919-772-7191</u>	<u><a href="mailto:krose@watcocorp.com">krose@watcocorp.com</a></u>
<u>Austin Ricco</u>	<u>BAR Construction</u>	<u>336-274-2477</u>	<u><a href="mailto:bids@barconstruction.com">bids@barconstruction.com</a></u>
<u>Andy Swofford</u>	<u>MECHWORKS IHC</u>	<u>336-333-2535</u>	<u><a href="mailto:aswofford@mechworksinc.com">aswofford@mechworksinc.com</a></u>
<u>Mike Ingram</u>	<u>AEI</u>	<u>919-605-1712</u>	<u><a href="mailto:mingram@aeieng.com">mingram@aeieng.com</a></u>
<u>Anthony Beale</u>	<u>UNC</u>	<u>919-904-0101</u>	<u><a href="mailto:anthony.beale@fac.unc.edu">anthony.beale@fac.unc.edu</a></u>
<u>Kyle Coble</u>	<u>UNC</u>	<u>919-869-5977</u>	<u><a href="mailto:kyle.coble@fac.unc.edu">kyle.coble@fac.unc.edu</a></u>
<u>Mike Brewington</u>	<u>Indicor Mechanical Inc</u>	<u>336-267-7829</u>	<u><a href="mailto:mike@indicormechanical.com">mike@indicormechanical.com</a></u>
<u>Adam Hurley</u>	<u>Indicor Mechanical Inc</u>	<u>336-465-4957</u>	<u><a href="mailto:adam@indicormechanical.com">adam@indicormechanical.com</a></u>

<b>Name</b>	<b>Company</b>	<b>Phone #</b>	<b>Email</b>
<u>Louis Wilson</u>	<u>HM Kern</u>	<u>336-668-3213</u>	<u><a href="mailto:estimating@hmkern.com">estimating@hmkern.com</a></u>
<u>Ryan Otten</u>	<u>ENFRA</u>	<u>262-391-6672</u>	<u><a href="mailto:ryan.otten@enfrasolutions.com">ryan.otten@enfrasolutions.com</a></u>
<u>Jake Bowman</u>	<u>Muter Construction</u>	<u>919-495-9677</u>	<u><a href="mailto:jbowman@muterconstruction.com">jbowman@muterconstruction.com</a></u>
<u>Spencer Peterson</u>	<u>Whiting-Turner</u>	<u>919-268-3791</u>	<u><a href="mailto:spencer.peterson@whiting-turner.com">spencer.peterson@whiting-turner.com</a></u>
<u>Conner King</u>	<u>Whiting-Turner</u>	<u>919-971-8889</u>	<u><a href="mailto:conner.king@whiting-turner.com">conner.king@whiting-turner.com</a></u>
<u>Jeremy Croom</u>	<u>Whiting-Turner</u>	<u>919-323-9624</u>	<u><a href="mailto:jeremy.croom@whiting-turner.com">jeremy.croom@whiting-turner.com</a></u>
<u>Jason Laney</u>	<u>Watson Elec</u>	<u>919-864-0603</u>	<u><a href="mailto:jason.laney@watsonelec.com">jason.laney@watsonelec.com</a></u>
<u>Brandon Yerger</u>	<u>DEDC</u>	<u>302-229-5597</u>	<u><a href="mailto:byerger@dedc-eng.com">byerger@dedc-eng.com</a></u>
<u>James Duffy</u>	<u>Titan Electrical</u>	<u>919-441-3155</u>	<u><a href="mailto:james.duffy@titanelectricalsolutions.com">james.duffy@titanelectricalsolutions.com</a></u>
<u>Chris Duven</u>	<u>Titan Electrical</u>	<u>919-713-3660</u>	<u><a href="mailto:chris.duven@titanelectricalsolutions.com">chris.duven@titanelectricalsolutions.com</a></u>
<u>Mel Kegley</u>	<u>UNC CAS</u>	<u>513-907-9070</u>	<u><a href="mailto:melkeg@unc.edu">melkeg@unc.edu</a></u>
<u>Kaz Aoyagi</u>	<u>ABL</u>	<u>919-696-3304</u>	<u><a href="mailto:kaoyagi@ablmechanical.com">kaoyagi@ablmechanical.com</a></u>
<u>Marcus Hawkins</u>	<u>Hawkins Plastering</u>	<u>919-414-2352</u>	<u><a href="mailto:plaster41@gmail.com">plaster41@gmail.com</a></u>
<u>Travis Langley</u>	<u>Lomax Construction</u>	<u>336-992-7000</u>	<u><a href="mailto:bids@lomaxconstruction.com">bids@lomaxconstruction.com</a></u>
<u>Glenn Collins</u>	<u>DARI</u>	<u>919-369-7477</u>	<u><a href="mailto:dgcollins@daricorp.com">dgcollins@daricorp.com</a></u>
<u>Billy Jones</u>	<u>Marlando Crane &amp; Rigging</u>	<u>919-810-1935</u>	<u><a href="mailto:billyj@morlandocrane.com">billyj@morlandocrane.com</a></u>





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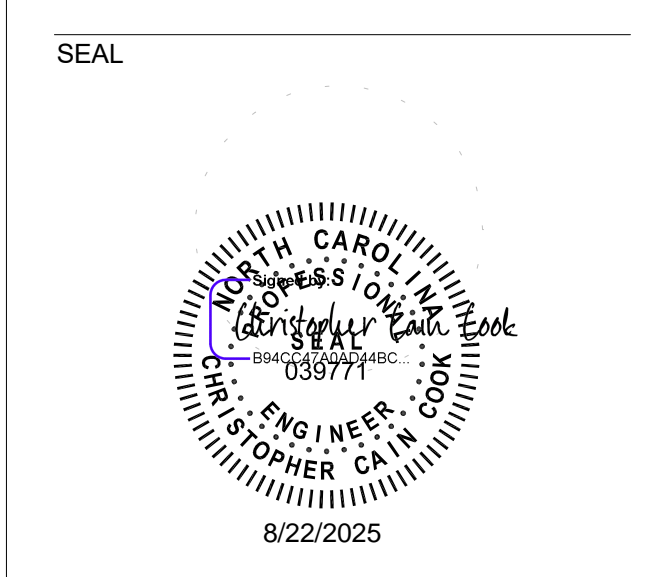
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<u>Lisa Biehle</u>	<u>Messer Construction</u>	<u>513-978-2856</u>	<u><a href="mailto:lbiehle@messer.com">lbiehle@messer.com</a></u>
<u>Kevin Rose</u>	<u>WATCO</u>	<u>919-772-7191</u>	<u><a href="mailto:krose@watcocorp.com">krose@watcocorp.com</a></u>
<u>Austin Ricco</u>	<u>BAR Construction</u>	<u>336-274-2477</u>	<u><a href="mailto:bids@barconstruction.com">bids@barconstruction.com</a></u>
<u>Andy Swofford</u>	<u>MECHWORKS IHC</u>	<u>336-333-2535</u>	<u><a href="mailto:aswofford@mechworksinc.com">aswofford@mechworksinc.com</a></u>
<u>Mike Ingram</u>	<u>AEI</u>	<u>919-605-1712</u>	<u><a href="mailto:mingram@aeieng.com">mingram@aeieng.com</a></u>
<u>Anthony Beale</u>	<u>UNC</u>	<u>919-904-0101</u>	<u><a href="mailto:anthony.beale@fac.unc.edu">anthony.beale@fac.unc.edu</a></u>
<u>Kyle Coble</u>	<u>UNC</u>	<u>919-869-5977</u>	<u><a href="mailto:kyle.coble@fac.unc.edu">kyle.coble@fac.unc.edu</a></u>
<u>Mike Brewington</u>	<u>Indicor Mechanical Inc</u>	<u>336-267-7829</u>	<u><a href="mailto:mike@indicormechnical.com">mike@indicormechnical.com</a></u>
<u>Adam Hurley</u>	<u>Indicor Mechanical Inc</u>	<u>336-465-4957</u>	<u><a href="mailto:adam@indicormechnical.com">adam@indicormechnical.com</a></u>

<b>Name</b>	<b>Company</b>	<b>Phone #</b>	<b>Email</b>
<u>Louis Wilson</u>	<u>HM Kern</u>	<u>336-668-3213</u>	<u><a href="mailto:estimating@hmkern.com">estimating@hmkern.com</a></u>
<u>Ryan Otten</u>	<u>ENFRA</u>	<u>262-391-6672</u>	<u><a href="mailto:ryan.otten@enfrasolutions.com">ryan.otten@enfrasolutions.com</a></u>
<u>Jake Bowman</u>	<u>Muter Construction</u>	<u>919-495-9677</u>	<u><a href="mailto:jbowman@muterconstruction.com">jbowman@muterconstruction.com</a></u>
<u>Spencer Peterson</u>	<u>Whiting-Turner</u>	<u>919-268-3791</u>	<u><a href="mailto:spencer.peterson@whiting-turner.com">spencer.peterson@whiting-turner.com</a></u>
<u>Conner King</u>	<u>Whiting-Turner</u>	<u>919-971-8889</u>	<u><a href="mailto:conner.king@whiting-turner.com">conner.king@whiting-turner.com</a></u>
<u>Jeremy Croom</u>	<u>Whiting-Turner</u>	<u>919-323-9624</u>	<u><a href="mailto:jeremy.croom@whiting-turner.com">jeremy.croom@whiting-turner.com</a></u>
<u>Jason Laney</u>	<u>Watson Elec</u>	<u>919-864-0603</u>	<u><a href="mailto:jason.laney@watsonelec.com">jason.laney@watsonelec.com</a></u>
<u>Brandon Yerger</u>	<u>DEDC</u>	<u>302-229-5597</u>	<u><a href="mailto:byerger@dedc-eng.com">byerger@dedc-eng.com</a></u>
<u>James Duffy</u>	<u>Titan Electrical</u>	<u>919-441-3155</u>	<u><a href="mailto:james.duffy@titanelectricalsolutions.com">james.duffy@titanelectricalsolutions.com</a></u>
<u>Chris Duven</u>	<u>Titan Electrical</u>	<u>919-713-3660</u>	<u><a href="mailto:chris.duven@titanelectricalsolutions.com">chris.duven@titanelectricalsolutions.com</a></u>
<u>Mel Kegley</u>	<u>UNC CAS</u>	<u>513-907-9070</u>	<u><a href="mailto:melkeg@unc.edu">melkeg@unc.edu</a></u>
<u>Kaz Aoyagi</u>	<u>ABL</u>	<u>919-696-3304</u>	<u><a href="mailto:kaoyagi@ablmechanical.com">kaoyagi@ablmechanical.com</a></u>
<u>Marcus Hawkins</u>	<u>Hawkins Plastering</u>	<u>919-414-2352</u>	<u><a href="mailto:plaster41@gmail.com">plaster41@gmail.com</a></u>
<u>Travis Langley</u>	<u>Lomax Construction</u>	<u>336-992-7000</u>	<u><a href="mailto:bids@lomaxconstruction.com">bids@lomaxconstruction.com</a></u>
<u>Glenn Collins</u>	<u>DARI</u>	<u>919-369-7477</u>	<u><a href="mailto:dgcollins@daricorp.com">dgcollins@daricorp.com</a></u>
<u>Billy Jones</u>	<u>Marlando Crane &amp; Rigging</u>	<u>919-810-1935</u>	<u><a href="mailto:billyj@morlandocrane.com">billyj@morlandocrane.com</a></u>





SCALE

REVISIONS

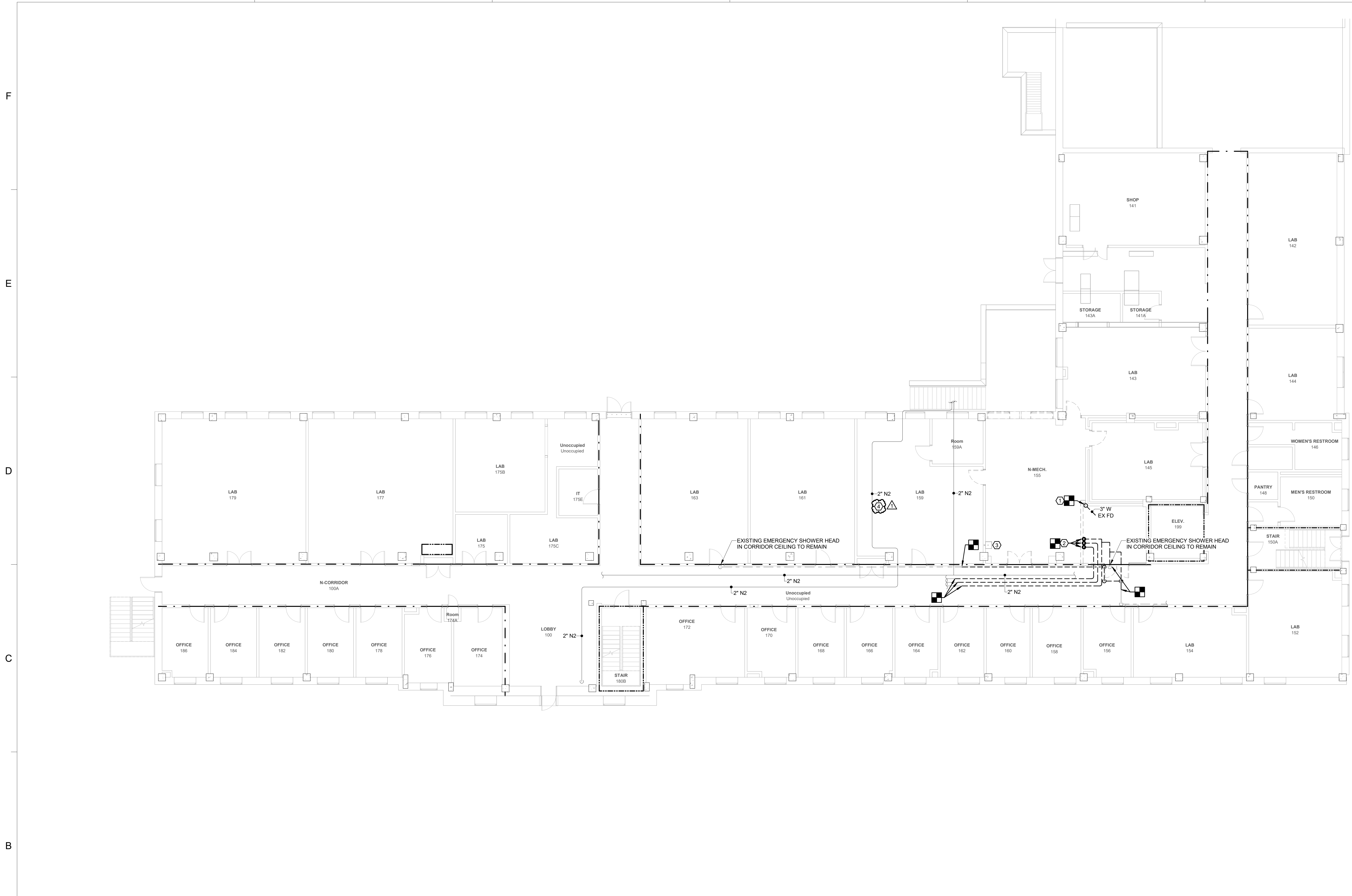
NO.	DESCRIPTION	DATE
1	ADDENDUM #2	08.22.2025

DRAWN BY TNA  
APPROVED BY CCC  
CHECKED BY CCC  
DATE 07/25/2025

TITLE  
**FIRST FLOOR PLUMBING DEMOLITION PLAN**

PROJECT NO. 50180848

**PD111**



**1 FIRST FLOOR PLUMBING DEMOLITION PLAN**  
Scale: 1/8" = 1'-0"

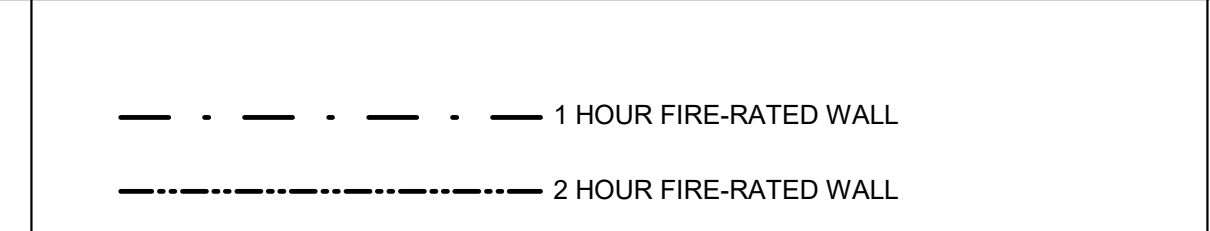
**GENERAL NOTES:**

- 1. REFER TO P-001 FOR ADDITIONAL GENERAL NOTES.
- 2. COORDINATE PLUMBING WORK WITH HVAC EQUIPMENT REPLACEMENT.

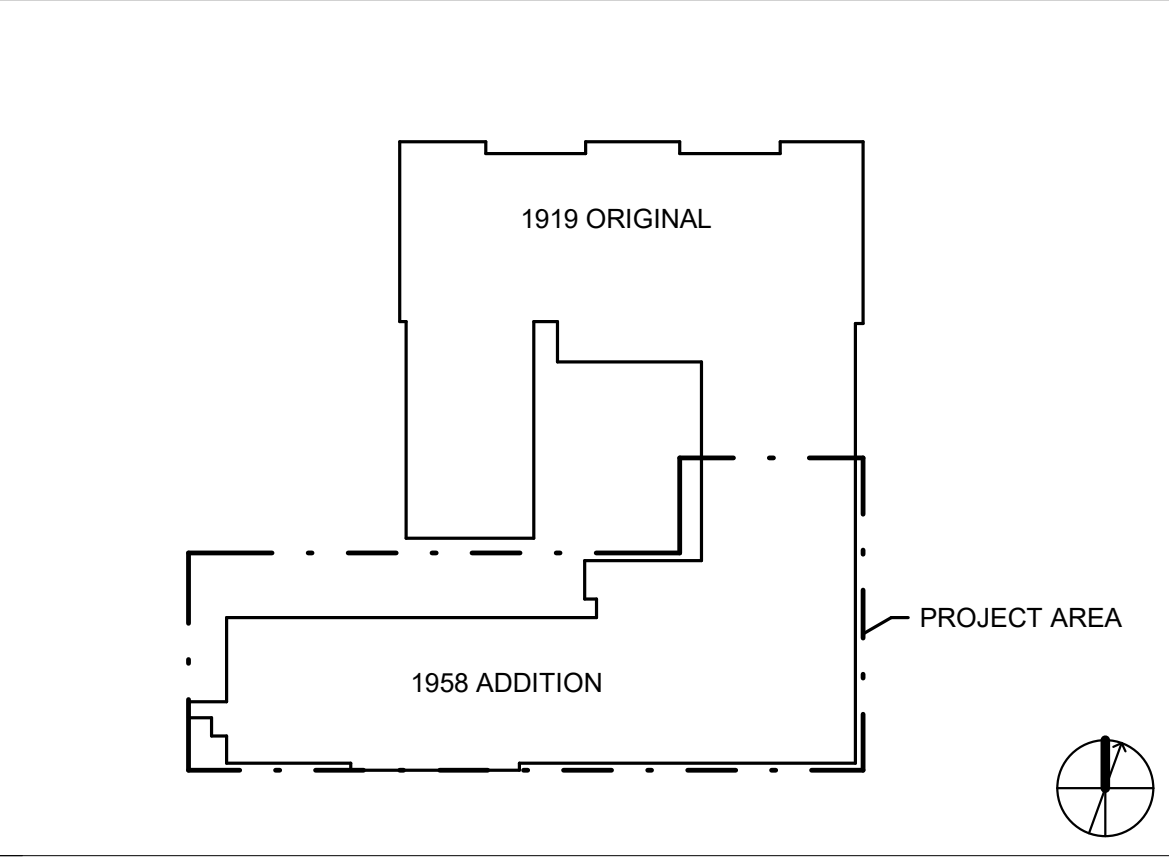
**KEYNOTES:**

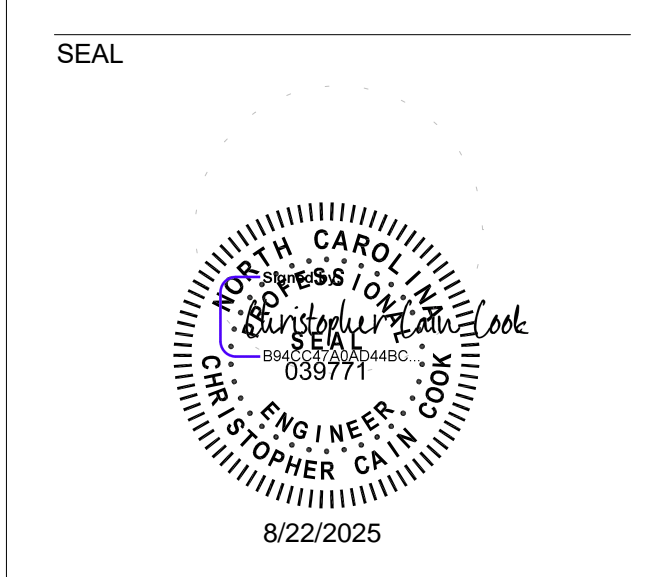
- 1. DEMOLISH STORM STACK FROM THE FIRST FLOOR UP TO THE ATTIC.
- 2. DEMOLISH EXISTING DOMESTIC WATER RISERS UP FROM GROUND FLOOR.
- 3. DEMOLISH EXISTING SINK AND PIPE CONNECTIONS BACK TO MAIN AND CAP.
- 4. PLUMBING CONTRACTOR TO PROVIDE PRICING TO REWORK SEVENTY-FIVE (75) LINEAR FEET OF NITROGEN PIPING INSIDE LAB 159 TO AVOID DUCTWORK SHOULD DEMOLITION REVEAL INADEQUATE HEIGHT TO PREVENT CONFLICTS BETWEEN THE EXISTING NITROGEN PIPING AND THE NEW DUCTWORK INSTALLATION. REFER TO MECHANICAL PLANS FOR ADDITIONAL DETAILS REGARDING THE NEW DUCTWORK. PRICING TO BE BASED UPON HARD-DRAWN COPPER PIPING WITH CAST COPPER FITTINGS AND BRAZED JOINTS. COST SHALL INCLUDE ALL HANGERS AND SUPPORTS REQUIRED FOR PIPING REWORK.

**WALL RATING LEGEND:**



**KEYPLAN:**





SCALE

REVISIONS

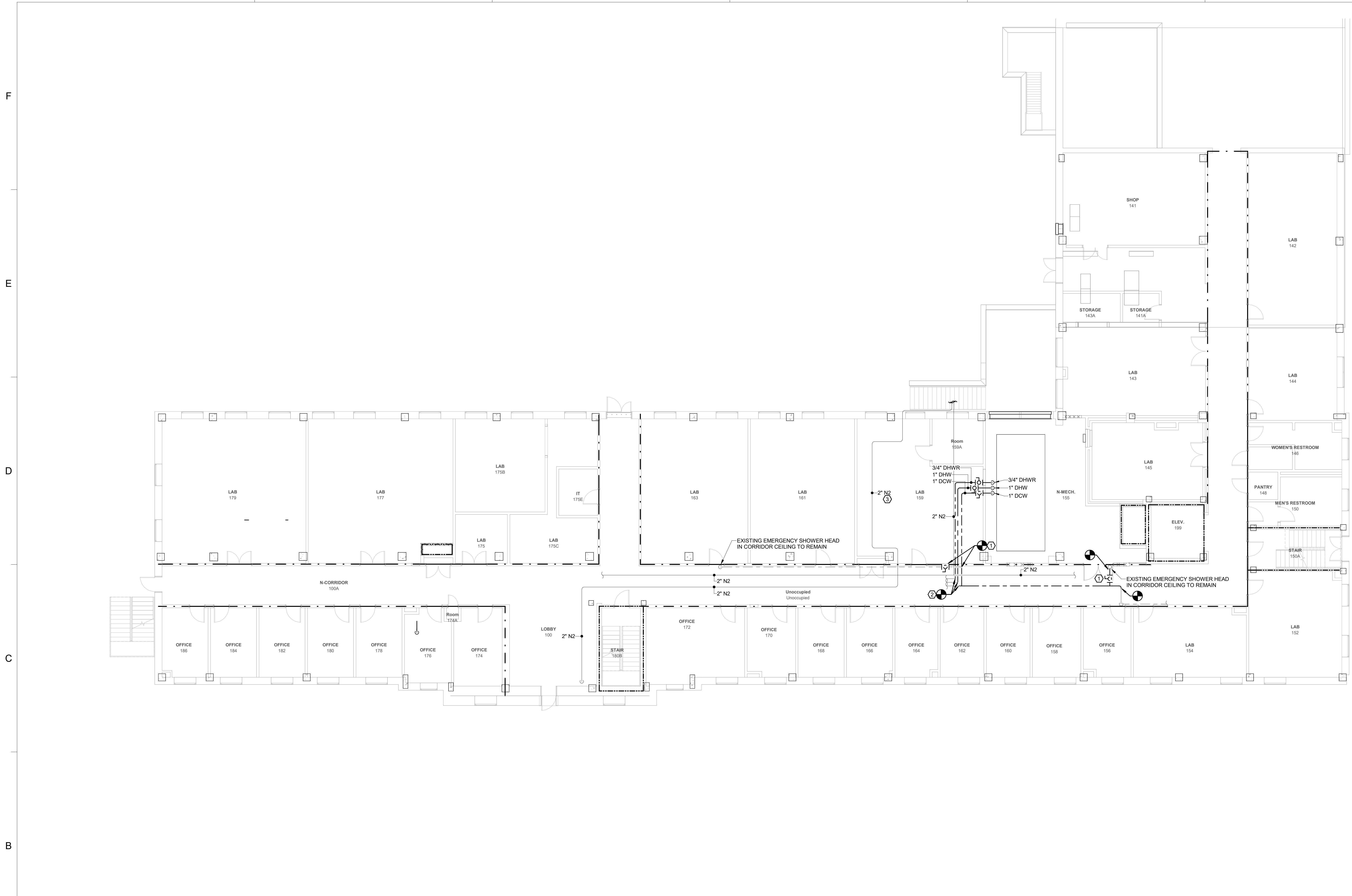
NO.	DESCRIPTION	DATE
1	ADDENDUM #2	08.22.2025

DRAWN BY: TNA  
 APPROVED BY: CCC  
 CHECKED BY: CCC  
 DATE: 07/25/2025

TITLE  
**FIRST FLOOR DOMESTIC WATER PLAN**

PROJECT NO. 50180848

**P-112**



**1 FIRST FLOOR DOMESTIC WATER PLAN**  
 Scale: 1/8" = 1'-0"

**GENERAL NOTES:**

- REFER TO P-001 FOR ADDITIONAL GENERAL NOTES.
- COORDINATE PLUMBING WORK WITH HVAC EQUIPMENT REPLACEMENT.

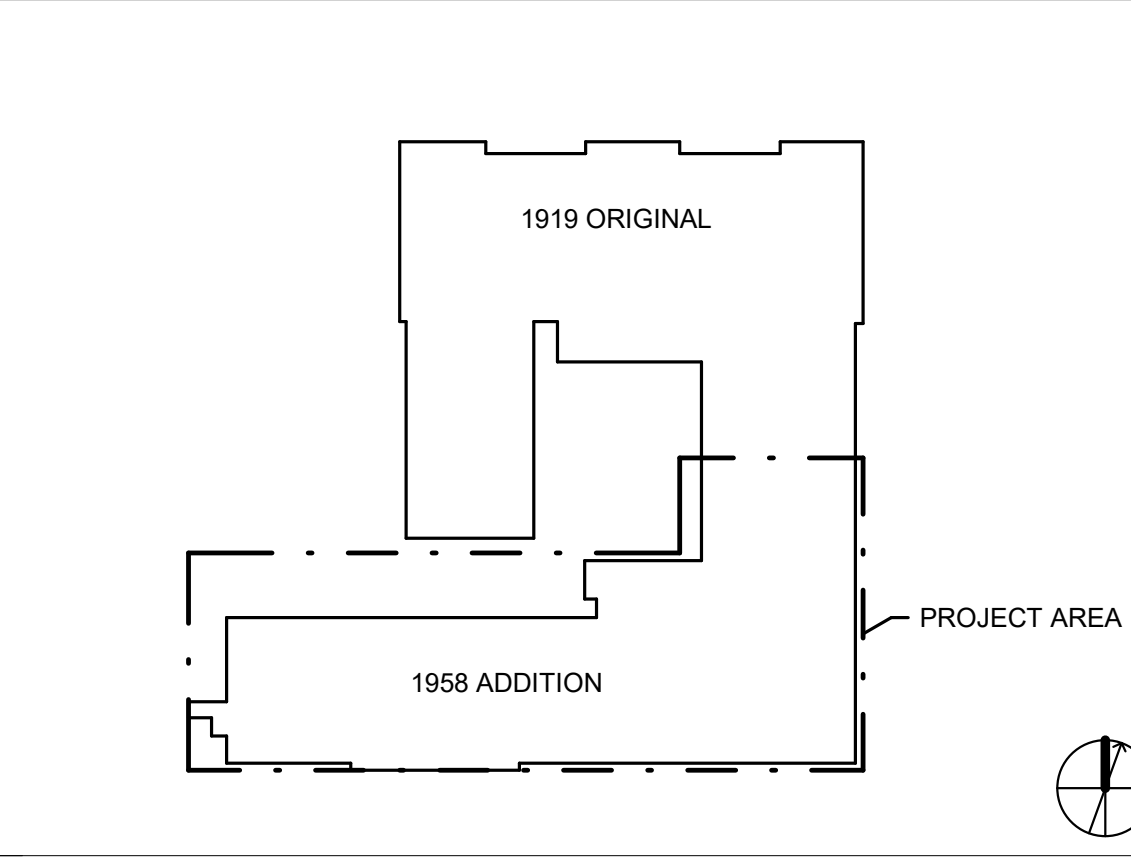
**KEYNOTES:**

- PROVIDE ISOLATION VALVE FOR EMERGENCY FIXTURE LOCKED OPEN. COORDINATE LOCKS WITH UNC FACILITIES.
- CONNECT NEW DOMESTIC WATER SERVICE TO EXISTING DOMESTIC WATER MAINS. PROVIDE ISOLATION VALVES IN DROPS.
- PLUMBING CONTRACTOR TO PROVIDE PRICING TO REWORK SEVENTY-FIVE (75) LINEAR FEET OF NITROGEN PIPING INSIDE LAB 159 TO AVOID DUCTWORK SHOULD DEMOLITION REVEAL INADEQUATE HEIGHT TO PREVENT CONFLICTS BETWEEN THE EXISTING NITROGEN PIPING AND THE NEW DUCTWORK INSTALLATION. REFER TO MECHANICAL PLANS FOR ADDITIONAL DETAILS REGARDING THE NEW DUCTWORK. PRICING TO BE BASED UPON HARD-DRAWN COPPER PIPING WITH CAST COPPER FITTINGS AND BRAZED JOINTS. COST SHALL INCLUDE ALL HANGERS AND SUPPORTS REQUIRED FOR PIPING REWORK.

**WALL RATING LEGEND:**

- 1 HOUR FIRE-RATED WALL
- 2 HOUR FIRE-RATED WALL

**KEYPLAN:**



## SECTION 23 73 11 – BLOWER COIL UNITS

### PART 1 - GENERAL

#### 1.1. SUMMARY

- A. Section includes packaged indoor blower coil units.

#### 1.2. SUBMITTALS

- A. Product Submittals: For each type of product indicated.
  - 1. Product Data: For each unit indicated, provide unit dimensions and weight; cabinet material, metal thickness, insulation, and accessories; certified fan-performance curves with system operating conditions indicated; motor ratings, electrical characteristics, and certified coil-performance ratings with system operating conditions indicated; dampers; and filters with performance characteristics.
- B. Close-Out Submittals:
  - 1. Operation and Maintenance Data: For units to include operation and maintenance manuals, including maintenance schedules and repair part lists for motors, coils, integral controls, and filters.

#### 1.3. QUALITY ASSURANCE

- A. Fabricate and label refrigeration system according to ASHRAE 15, "Safety Standard for Refrigeration Systems."
- B. Electrical Components, Devices and Accessories: UL listed and labeled as defined by NFPA 70, the National Electric Code, or equivalent by a qualified testing agency marked for the intended location and application and accepted by the Authority Having Jurisdiction and Engineer.
- C. Mechanical Equipment and Materials: UL listed and labeled as defined by State Building Codes or equivalent by a qualified testing agency marked for the intended location and application and accepted by the Authority Having Jurisdiction and Engineer.
- D. Testing and listing laboratories of mechanical and electrical equipment shall be accredited by the North Carolina Building Code Council (NCBCC).

#### 1.4. COORDINATION

- A. Coordinate sizes and locations of concrete bases with actual equipment provided.

- B. Coordinate sizes and locations of structural-steel support members, if any, with actual equipment provided.
- C. Coordinate location of piping and electrical rough-ins.

#### 1.5. WARRANTY

- A. Warranty: Parts and labor warranty of 1 year for the entire unit from the date of Owner Acceptance.

#### 1.6. EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Filters: Two set(s) for each blower coil unit.
  - 2. Fan Belts: Two set(s) for each blower coil unit fan.

### PART 2 - PRODUCTS

#### 2.1. MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Airtherm (BBH/BDH series)
  - 2. Carrier (39S series)
  - 3. Enviro-Tec (H/V/VB/VR series)
  - 4. Greenheck (LFC/VFC series)
  - 5. Johnson Controls/York (BCU series)
  - 6. Titus (TB series)
  - 7. Trane Company (BC series)

#### 2.2. HORIZONTAL AND VERTICAL BLOWER COIL UNITS

- A. Blower Coil Unit Configurations: Provide vertical and horizontal unit configurations as indicated in the documents.
- B. Factory-packaged and tested units rated according to AHRI 440, ASHRAE 33 and UL 1995.
- C. Casing Fabrication: Factory-fabricated and constructed wall, roof and floor single-wall 18-gauge galvanized steel casing panels with 1-inch (R-4) insulation, board or

- coated glass fiber with foil-face, and formed galvanized steel channel framing. No through-metal casing thermal breaks. All joints shall be water-resistant sealed. Casing shall meet ASHRAE 111 with less than 2.0% leakage at 1.0-inches w.g. pressure. Unit shall have removable access panels to maintain all components.
1. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84 by a qualified testing agency.
- D. Fan and Motor: Removable fan and motor board. Motors shall be permanently-lubricated, multispeed; resiliently mounted on motor board that comply with Section 230513. Connect motor to chassis wiring with plug connection.
1. Direct-Driven Fans: Double width, forward curved, centrifugal; with permanently lubricated, multispeed motor resiliently mounted in the fan inlet. Aluminum or painted-steel wheels, and painted-steel or galvanized-steel fan scrolls.
- E. Heating and Cooling Coils: Provide units with coil types indicated in the documents.
1. Coil Configuration: Dual coil units shall have separate heating and cooling coils with the heating coil in the reheat position regardless of control sequence.
  2. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch , rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.
- F. Hydronic Piping Package: Factory-fabricated coil piping packages with Type L copper tube with wrought-copper fittings and brazed joints. Label piping to indicate service, inlet, and outlet.
1. Control Valves: Two or three-way control valves with modulating actuators as indicated on the drawings.
  2. Isolation Valves: Ball valves.
  3. Y-Pattern Strainers: Install with 1/2-inch NPS hose-end ball valve blowdown valve in drain connection.
  4. Hose Kits: 24-inch long hoses with minimum diameter to match unit piping connections rated for minimum 400-psig working pressure and operating temperatures from 35 to 210 deg F.
  5. Wrought-Copper Unions
- G. Drain Pans: ABS plastic or stainless steel main drain pans with drain piping connections fabricated to comply with ASHRAE 62.1.
1. Auxiliary Drain Pans: ABS plastic or stainless steel auxiliary pans shall be provided when factory-fabricated piping packages are included or when otherwise indicated in the documents.
  2. Condensate Drain Pan Overflow Safety Switch: Low-voltage, float-type safety switch designed for condensate drain pan high-level alarm for unit shutdown and alarming. Switch shall shutdown unit when condensate levels in the drain pan

reach the high-level mark. Little Giant Pump/Franklin Electric (ACS series) or Engineer approved equal.

- H. Filters: 1-inch, MERV-8 complying with Section 234100.
- I. Electrical Connection: Factory wired motors and controls for a single point electrical connection. Electrical components shall comply with NFPA 70 and Division 26.
- J. DDC Controls: Controls shall be field installed by the building automation system (BAS) installer. Refer to Sequences of Operation and Section 230900 for requirements.

## PART 3 - EXECUTION

### 3.1. EXAMINATION

- A. Examine roughing-in for piping and electrical connections to verify actual locations before blower coil unit installation.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2. INSTALLATION

- A. Install blower coil units level and plumb.
- B. Install blower coil units to comply with NFPA 90A.
- C. Suspend blower coil units from structure with elastomeric hangers.
- D. Verify locations of thermostats, humidistats, and other exposed control sensors with drawings and room details before installation. Install devices 48-inches above finished floor.
- E. Install new filters in each blower coil unit within two weeks after Substantial Completion.

### 3.3. CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:
  - 1. Install piping adjacent to machine to allow service and maintenance.
  - 2. Connect piping to blower coil unit factory hydronic piping package. Install piping package if shipped loose.
  - 3. Connect condensate drain to indirect waste.
    - a. Install condensate trap of adequate depth to seal against fan pressure. Install cleanouts in piping at changes of direction.

- B. Connect supply-air and return-air ducts to blower coil units with flexible duct connectors specified in Section 233300.
- C. Ground and connect equipment according to comply with NFPA 70 and Division 26.

#### 3.4. FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - 2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
  - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
- B. Remove and replace malfunctioning units and retest as specified above.
- C. Prepare test and inspection reports.

#### 3.5. ADJUSTING

- A. Adjust initial temperature and humidity set points.
- B. Replace fan and motor pulleys as required to achieve design airflow. Coordinate with the TAB Contractor.

#### 3.6. DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain blower coil units.

END OF SECTION

## SECTION 23 82 19 – FAN COIL UNITS

### PART 1 - GENERAL

#### 1.1. SUMMARY

- A. Section includes fan coil units.

#### 1.2. SUBMITTALS

- A. Product Submittals: For each type of product, including rated capacities, operating characteristics, and furnished specialties and accessories.
  - 1. Paint Samples: For units with factory-applied color finishes.
- B. Close-Out Submittals:
  - 1. Operation and Maintenance Data: For fan coil units to include in emergency, operation, and maintenance manuals, including maintenance schedules and repair part lists for motors, coils, integral controls, and filters.

#### 1.3. MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
  - 1. Fan Coil Unit Filters: Furnish one spare filters for each filter installed.
  - 2. Fan Belts: Furnish one spare fan belts for each unit installed.

#### 1.4. QUALITY ASSURANCE

- A. Electrical Components, Devices and Accessories: UL listed and labeled as defined by NFPA 70, the National Electric Code, or equivalent by a qualified testing agency marked for the intended location and application and accepted by the Authority Having Jurisdiction and Engineer.
- B. Mechanical Equipment and Materials: UL listed and labeled as defined by State Building Codes or equivalent by a qualified testing agency marked for the intended location and application and accepted by the Authority Having Jurisdiction and Engineer.
- C. Testing and listing laboratories of mechanical and electrical equipment shall be accredited by the North Carolina Building Code Council (NCBCC).

#### 1.5. COORDINATION

- A. Coordinate layout and installation of fan coil units and suspension system components with other construction that penetrates or is supported by ceilings, including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.
- B. Coordinate size and location of wall sleeves for outdoor-air intake.

## PART 2 - PRODUCTS

### 2.1. GENERAL REQUIREMENTS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
  - 1. Airtherm
  - 2. Carrier
  - 3. Daikin/McQuay
  - 4. Greenheck
  - 5. Johnson Controls/York
  - 6. Trane
- B. Factory-packaged and tested units rated according to AHRI 440, ASHRAE 33 and UL 1995.
- C. Coil Section Insulation: 1/2-inch thick, coated glass fiber, foil-covered closed-cell foam or matte-finish closed-cell foam complying with ASTM C 1071 and attached with adhesive complying with ASTM C 916.
  - 1. Surface-Burning Characteristics: Insulation and adhesive shall have a combined maximum flame-spread index of 25 and smoke-developed index of 50 when tested according to ASTM E 84 by a qualified testing agency.
- D. Heating and Cooling Coils: Provide units with coil types indicated in the documents.
  - 1. Coil Configuration: Dual coil units shall have separate heating and cooling coils with the heating coil in the reheat position regardless of control sequence.
  - 2. Hydronic Coils: Copper tube, with mechanically bonded aluminum fins spaced no closer than 0.1 inch , rated for a minimum working pressure of 200 psig and a maximum entering-water temperature of 220 deg F. Include manual air vent and drain valve.
- E. Hydronic Piping Package: Factory-fabricated coil piping packages with Type L copper tube with wrought-copper fittings and brazed joints. Label piping to indicate service, inlet, and outlet.
  - 1. Control Valves: Two or three-way control valves with modulating actuators as indicated on the drawings.

2. Isolation Valves: Ball valves.
  3. Y-Pattern Strainers: Install with 1/2-inch NPS hose-end ball valve blowdown valve in drain connection.
  4. Hose Kits: 24-inch long hoses with minimum diameter to match unit piping connections rated for minimum 400-psig working pressure and operating temperatures from 35 to 210 deg F.
  5. Wrought-Copper Unions
- F. Drain Pans: ABS plastic or stainless steel main drain pans with drain piping connections fabricated to comply with ASHRAE 62.1.
1. Integral Condensate Pump: Provide units with integral condensate pumps where gravity drainage cannot be achieved.
  2. Auxiliary Drain Pans: ABS plastic or stainless steel auxiliary pans shall be provided when factory-fabricated piping packages are included or when otherwise indicated in the documents.
  3. Condensate Drain Pan Overflow Safety Switch: Low-voltage, float-type safety switch designed for condensate drain pan high-level alarm for unit shutdown and alarming. Switch shall shutdown unit when condensate levels in the drain pan reach the high-level mark. Little Giant Pump/Franklin Electric (ACS series) or equal.
    - a. Switches installed above ceilings shall be rated for plenum use and comply with UL 508.
- G. Filters: 1-inch, MERV-8 complying with Section 234100.
- H. Electrical Connection: Factory wired motors and controls for a single point electrical connection.
- I. DDC Controls: Controls shall be field installed by the building automation system (BAS) installer. Refer to Sequences of Operation and Section 230900 for requirements.

## 2.2. HORIZONTAL AND VERTICAL FAN COIL UNITS

- A. Fan Coil Unit Configurations: Provide unit configurations as indicated in the documents.
1. Horizontal Types:
    - a. Fully exposed, mounted below finished ceiling.
    - b. Recessed, flush-mounted to ceiling.
    - c. Fully concealed, mounted above accessible ceiling.
  2. Vertical Types:
    - a. Fully exposed, wall-mounted with flat or sloped top.

- b. Semi-recessed in wall cavity.
  - c. Fully-recessed in wall cavity.
- B. Chassis: Minimum 18-gauge thick galvanized steel. Floor-mounted units shall have leveling screws. Exposed unit surfaces shall have a baked powder-coat finish and removable access panel. Finish shall be one of the manufacturer's standard or published optional colors as selected by the Owner/Engineer.
- 1. Horizontal Unit Bottom Panels: Fastened to unit with cam fasteners and hinge and attached with safety chain; with integral stamped grilles.
  - 2. Vertical Unit Front Panels: Removable, steel, with integral stamped discharge grille and channel-formed edges, cam fasteners, and insulation on back of panel.
  - 3. Grilles: Supply and return grille orientations as indicated.
- C. Fan and Motor: Removable fan and motor board. Motors shall be permanently-lubricated, multispeed; resiliently mounted on motor board that comply with Section 230513. Connect motor to chassis wiring with plug connection.
- 1. Direct-Driven Fans: Double width, forward curved, centrifugal; with permanently lubricated, multispeed motor resiliently mounted in the fan inlet. Aluminum or painted-steel wheels, and painted-steel or galvanized-steel fan scrolls.

## PART 3 - EXECUTION

### 3.1. EXAMINATION

- A. Examine areas, with Installer present, to receive fan coil units for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for piping and electrical connections to verify actual locations before fan coil unit installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2. INSTALLATION

- A. Install fan coil units level and plumb.
- B. Install fan coil units to comply with NFPA 90A.
- C. Suspend fan coil units from structure with elastomeric hangers.
- D. Verify locations of thermostats, humidistats, and other exposed control sensors with drawings and room details before installation. Install devices 48-inches above finished floor.
- E. Install new filters in each fan coil unit within two weeks after Owner Acceptance.

### 3.3. CONNECTIONS

- A. Piping installation requirements are specified in other Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:
  - 1. Install piping adjacent to machine to allow service and maintenance.
  - 2. Connect piping to fan coil unit factory hydronic piping package. Install piping package if shipped loose.
  - 3. Connect condensate drain to indirect waste.
    - a. Install condensate trap of adequate depth to seal against fan pressure. Install cleanouts in piping at changes of direction.
- B. Connect supply-air and return-air ducts to fan coil units with flexible duct connectors specified in Section 233300 "Air Duct Accessories."
- C. Ground and connect equipment according to comply with NFPA 70 and Division 26.

### 3.4. FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
  - 1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
  - 2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
  - 3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.
- B. Remove and replace malfunctioning units and retest as specified above.
- C. Prepare test and inspection reports.

### 3.5. ADJUSTING

- A. Adjust initial temperature and humidity set points.
- B. Replace fan and motor pulleys as required to achieve design airflow. Coordinate with the TAB Contractor.

### 3.6. DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fan coil units.

END OF SECTION