25010 – Randolph Central – High School HVAC Upgrade
Addendum 1

December 3, 2025

General Notifications

Modifications described herein shall be incorporated into the project documents. All other work described in the project documents shall remain unchanged.

Acknowledge receipt of this Addendum by noting it on the Bid Form. Failure to do so may subject bidder to disqualification. This Addendum is a part of the contract documents.

Pre-Bid Meeting Minutes

The attached meeting minutes are a summary of the three pre-bid meetings held on the project.

Pre-Bid Sign-In Sheet. Attendance at a minimum of one of the pre-bid meetings is required for prime bidders.

Bidding Questions and Answers

The below questions have been submitted either electronically or asked during the pre-bid walkthrough.

Question 1: What is the last day of School for the current school year?

Answer 1: May 21, 2026 is the last scheduled day of school but there is a teachers workday on May 22, 2026. There is a possibility of the last day being May 28, 2026 depending on the number of snow days taken over the course of the school year.

Question 2: Are background checks required.

Answer 2: Yes, provide background checks as part of Contractor's formal security program. Refer to Section 013553.

Question 3: Will mobile furniture be moved by the owner?

Answer 3: Yes.

Question 4: Can piping in Unit B routed from the ceiling down to the science wing be exposed?

Answer 4: Yes. The exposed piping (insulation jacket) is required to be painted to match the wall and escutcheons required at ceiling and wall penetrations.

Question 4: Is there glycol in the hydronic system?

Answer 4: No

Question 5: Is the roof under warranty? If so, what company is the warranty under?

Answer 5: The roof is not under warranty, contact Simmons Roof Maintenance in Muncie Indiana (765) 808-7884 with questions.

Question 6: What is the current roofing system?

Answer 6: The roof system over the Cafeteria area is TPO.

Question 7: Regarding the Cafeteria piping, the 4" mains are shown in Alternate 2. The piping wouldn't be there for Alternates 1 and 3 if Alternate 2 isn't accepted. Please confirm this is correct.

Answer 7: Sheet M302 has been updated to clarify the scope split between the Base Bid and Alternate scope.

Changes to the Drawings

Modify the attached drawings below as indicated in the clouded areas.

1. Sheet M102 – ADDED demolition scope in Kitchen.
2. Sheet M103 – ADDED demolition scope in Kitchen, Dry Storage, and Kitchen Office areas; Clarified scope between Alternate 3 and Alternate 4.
3. Sheet M202 – ADDED new scope in Kitchen.
4. Sheet M203 – ADDED new scope in Kitchen, Dry Storage, and Kitchen Office areas; ADDED new scope to Kiln area.
5. Sheet M302 – ADDED new scope in Kitchen; Clarified scope division between Base Bid, Alternate 2, and Alternate 3.
6. Sheet M303 – ADDED new scope in Kitchen, Dry Storage, and Kitchen Office areas.
7. Sheet M304 – ADDED duct replacement scope on the roof.
8. Sheet M600 – MODIFIED Grille/Register and Diffuser Schedule; Modified Fan Coil Unit Schedule.
9. Sheet M800 – MODIFIED Detail 4 to include rigid duct to diffuser connection.
10. Sheet E102 - ADDED new scope in Kitchen.
11. Sheet E103 - ADDED new scope in Kitchen, Dry Storage, and Kitchen Office areas.
12. Sheet E201 - ADDED new scope at all Fan Coil Units.
13. Sheet E202 - ADDED new scope at all Fan Coil Units and in Kitchen.
14. Sheet E203 - ADDED new scope at all Fan Coil Units and in Kitchen, Dry Storage, and Kitchen Office areas.
15. Sheet E601 - ADDED circuit breakers in all four panels.

Changes to the Specifications

Section 220700 – Mechanical Insulation

1. Revise this Section as indicated in **red** text in the attached revised section.

Section 238219 – Fan Coil Units

1. At Article 2.02:
    a. Revise Paragraph C, subparagraph 6 to read "Division 26 contractor shall provide 120V/1/60 outlet at the unit for powering condensate pump. The Contractor shall provide field installed condensate pump(s) as scheduled and noted in Paragraph H."
    b. Revise Paragraph D, subparagraph 7 to read "Division 26 contractor shall provide 120V/1/60 outlet at the unit for powering condensate pump. The Contractor shall provide field installed condensate pump(s) as scheduled and noted in Paragraph H".
    c. Revise Paragraph H to read: "Condensate Pump: Provide a field installed condensate pump, 115V plug-in type condensate pump equal to Little Giant VCMA-20UL Pro.

Attachments

1. Pre-Bid Meeting Minutes
2. Pre-Bid Sign-In Sheet.
3. Sheet M102 – Penthouse Mechanical Demolition Plan
4. Sheet M103 – Mechanical First Floor Demolition Plans
5. Sheet M202 – Mechanical First Floor Plan – Unit C
6. Sheet M203 – Mechanical First Floor Plan – Unit B
7. Sheet M302 – Mechanical Piping First Floor Plan – Unit C and G
8. Sheet M303 – Mechanical Piping First Floor Plan – Unit E
9. Sheet M304 – Mechanical Piping Second Floor Plan – Unit C and G
10. Sheet M600 – Mechanical Schedules
11. Sheet M800 – Mechanical Details
12. Sheet E102 - Electrical First Floor Demolition Plan – Unit C
13. Sheet E103 - Electrical First Floor Demolition Plan – Unit E
14. Sheet E201 - Electrical First Floor Power/Systems Plan – Unit B
15. Sheet E202 - Electrical First Floor Power/Systems Plan – Unit C & G
16. Sheet E203 - Electrical First Floor Power/Systems Plan – Unit E
17. Sheet E601 – Electrical Schedules
18. Section 220700 – Mechanical Insulation

End of ADDENDUM 1

Prebid Meeting – Minutes

Meeting Date: 11-24-2025; 3:30 PM EST

Project: Randolph Central School Corporation High School HVAC Equipment Replacement

Agenda Items:

1. Introductions
   A. Owner:
      1. Randolph Central School Corporation.
   B. Owner's Representatives
      1. Roland Abraham - Superintendent.
      2. Mike Stump – Facilities Director
   C. Consultant – ATP Engineering
      1. Andy Enloe – Mechanical (akenloe@atp-eng.com)
      2. Brian Abel – Electrical (babel@apt-eng.com)
2. Project Description
   A. The project consists of work in the High School.
      1. Replace the existing VRF air conditioning system with a new hydronic based fan coil unit system in various areas of the existing high school. The project also includes alternates for the work shown.
3. **Davis-Bacon Act and Related Requirements**
   A. **Refer to Section 007346. This project must conform to the Davis-Bacon Act and provide the prevailing wages published by the U.S. Department of Labor**.
4. Project Schedule
   A. Project completion date shall be no later than July 27, 2026.
      1. Work is required to be performed during school holiday periods (winter break, spring break, summer break) when the spaces involved will be accessible to the Contractor.
      2. Access to perform site observations in occupied areas is allowed if coordinated with the Owner. This type of work is expected to happen after normal school hours and/or on weekends.
5. Electronic File Transfer:
   A. The project will utilize a web-based document management system.
   B. The successful contractor may suggest utilizing an existing platform that they have access to and are familiar with (such as Procore, Plan Grid, eBuilder, etc.), however the contractor will be responsible to provide licenses for the owner and engineer to use the system.

C. If the successful Contractor does not suggest a platform, Bluebeam Session will be utilized. The successful Contractor will be responsible to provide their own Bluebeam license(s) and a two license(s) for the Owner to access Bluebeam Session.

D. The selected platform will be the location for RFI's, Submittal, ASI's, PR's and pay applications.

E. Contractors must have appropriate hardware/software to create and read PDF documents.

6. Protocol for Questions prior to Bidding:

   A. Questions shall be submitted in writing via e-mail to ATP Engineering, akenloe@atp-eng.com. The last day for questions is noon on December 2, 2025.

7. Bids will be accepted at or before 11:00 P.M. Eastern Time on December 8, 2025

   A. Submit bids in person at the Randolph Central School Corporation office. The address is 407 E. Fourth Street, Winchester, Indiana 47394.

   B. Public Bid Opening: Bids will be read aloud.

   C. Late Bids will not be accepted.

8. Documents are available from Eastern Engineering. Contact Eastern for deposit and purchase information.

9. Alternates – There are four project Alternate Bids. Refer to Section 012300 for a Description of Alternates.

   A. Alternate No. 1 – Unit C Administration Area.

   B. Alternate No. 2 – Unit C Cafeteria.

   C. Alternate No. 3 – Unit C/E Kitchen/Serving

   D. Alternate No. 4 – Unit E Classrooms

10. Parking, Dumpster and Staging

    A. There should be adequate space on site for these items. Coordinate exact locations and requirements with the Owner.

11. Concurrent Projects

    A. None.

12. A tour of project spaces was taken by the Contractors in attendance.

ATP ENGINEERING

11-24-2025

Prebid Meeting – Sign-In Sheet

Randolph Central School Corporation
High School HVAC Equipment Replacement

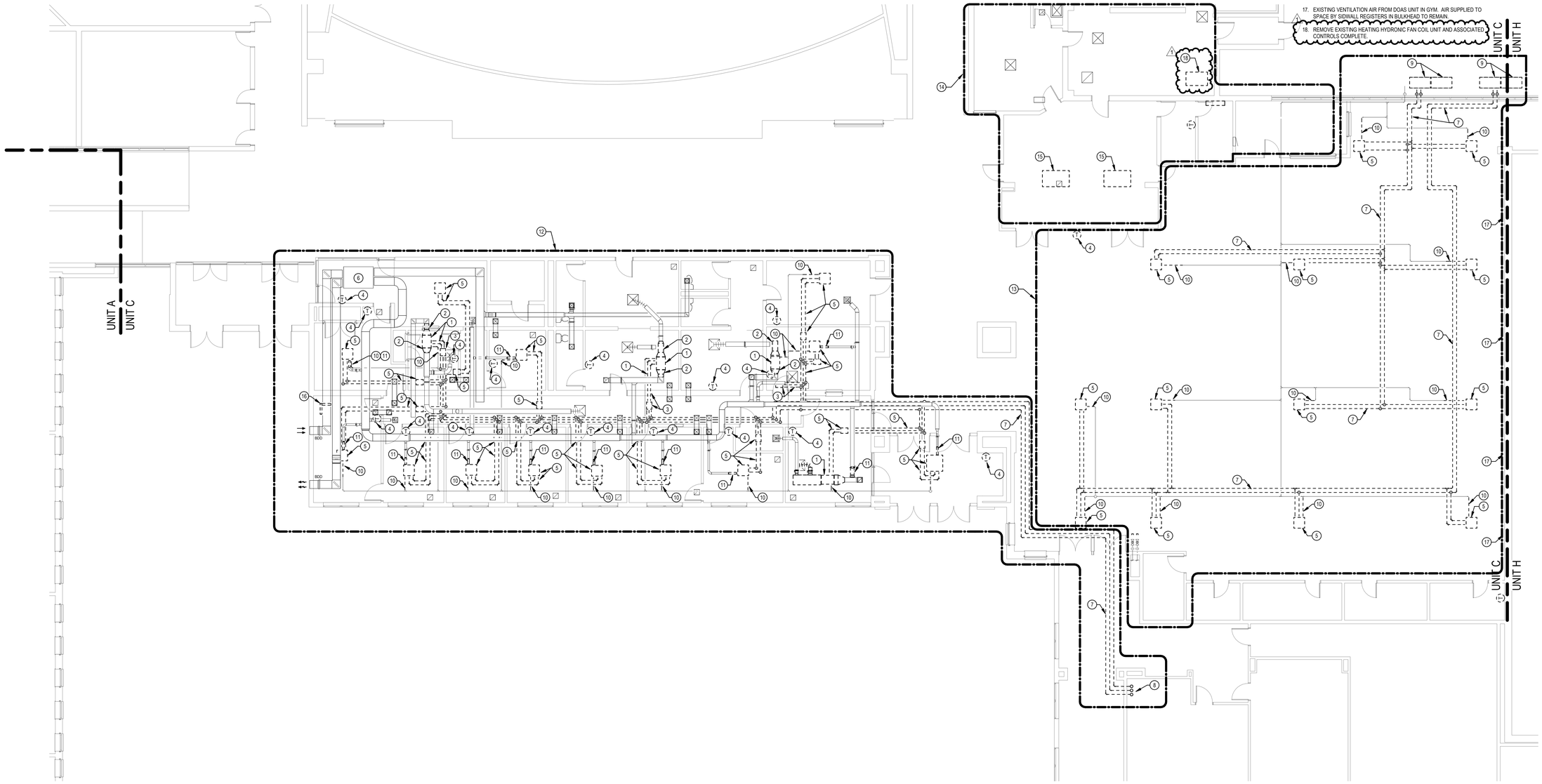
Company	Name	Phone Number	Email
Frieje Engineering Solutions	BRIAN FENNIG	260-385-5352	bfenning@fes-co.com
Quality Plumbing + Heating	Andy Skeen	765-748-4447	Estimating@QPH.com
J+J Electric	Matt Terhaar	(765) 546-2277	MTerhaar@jandjelectric.net
J&J Electric	Jody Steed	765 669-0100	Jsteed@jandjelectric.NET

GENERAL NOTES:

1. CONTRACTOR SHALL REMOVE AND RE-INSTALL CEILINGS/CEILING TILES AS NECESSARY TO PROVIDE THE WORK INDICTAED. PROTECT EXISTING TILES DURING CONSTRUCTION AND REPLACE TILES THAT ARE DAMAGED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS NECESSARY TO PROVIDE THE WORK INDICATED.
3. PERFORM PRE-DEMOLITION TESET AND BALANCE MEASUREMENT OF ALL AIR TERMINAL OUTLETS AND INLETS, AS WELL AS ALL OUTSIDE AIR CONNECTIONS TO FAN COIL UNITS. SUBMIT REPORT TO THE ENGINEER OF RECORD FOR REVIEW.

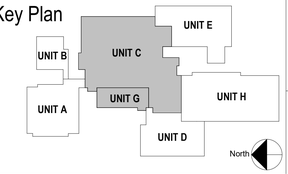
DEMOLITION NOTES:

1. REMOVE EXISTING VRF FAN COIL UNIT, RELATED REFRIGERANT PIPING, TYP.
2. REMOVE PORTION OF EXISTING DUCTWORK INDICATED. PREPARE DUCT FOR NEW CONNECTION.
3. REMOVE EXISTING BRANCH SELECTOR BOX AND RELATED REFRIGERANT PIPING, TYP.
4. REMOVE EXISTING VRF UNIT THERMOSTAT, TYP.
5. REMOVE EXISTING CEILING MOUNTED VRF FAN COIL CASSETTE, RELATED REFRIGERANT PIPING, AND BRANCH SELECTOR BOX, TYP.
6. EXISTING ERU UNIT SHALL REMAIN.
7. REMOVE EXISTING REFRIGERANT MAINS.
8. REMOVE EXISTING REFRIGERANT MAINS UP TO CONDENSING UNITS ON ROOF.
9. REMOVE EXISTING AIR COOLED CONDENSING UNITS, TYP.
10. REMOVE PORTION OF EXISTING CONDENSATE DRAIN INDICATED, TYP.
11. REMOVE PORTION OF EXISTING DUCT AS INDICATED. PREPARE DUCT FOR NEW CONNECTION, TYP.
12. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 1.
13. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 2.
14. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 3.
15. REMOVE EXISTING HEATING HYDRONIC FAN COIL UNITS. CAP SUPPLY AND RETURN PIPING AT MAIN.
16. REMOVE EXISTING DUCT HEATING COIL.
17. EXISTING VENTILATION AIR FROM DOAS UNIT IN GYM. AIR SUPPLIED TO SPACE BY SIDWALL REGISTERS IN BULKHEAD TO REMAIN.
18. REMOVE EXISTING HEATING HYDRONIC FAN COIL UNIT AND ASSOCIATED CONTROLS COMPLETE.



1 MECHANICAL FIRST FLOOR DEMOLITION - UNIT C AND G
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

DAVID SHUPE REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

Certified By:

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION * WINCHESTER INDIANA *

Title: **MECHANICAL FIRST FLOOR DEMOLITION PLAN - UNIT C AND G**

Project: **HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT**
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:

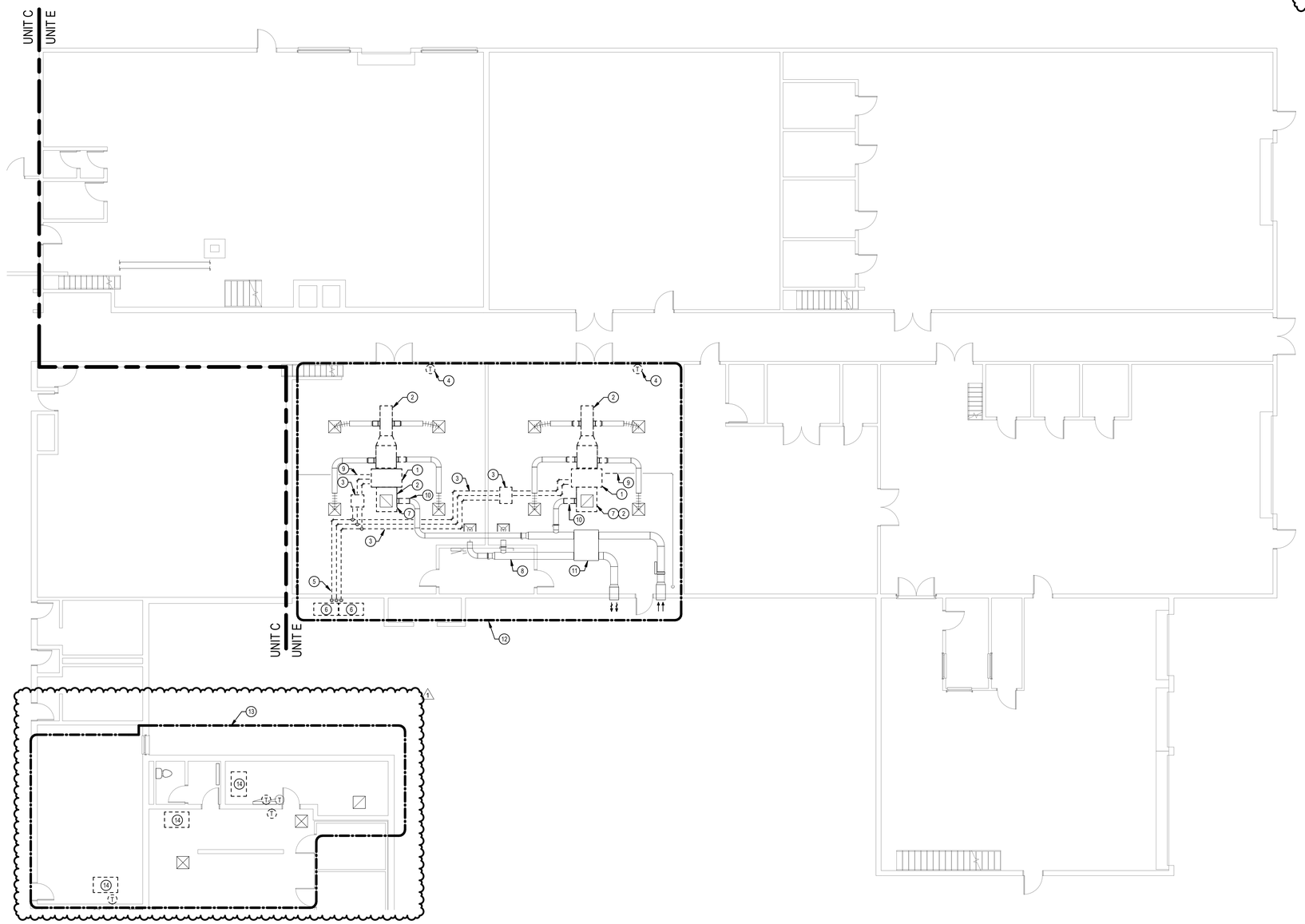
M102

GENERAL NOTES:

1. CONTRACTOR SHALL REMOVE AND RE-INSTALL CEILINGS/CEILING TILES AS NECESSARY TO PROVIDE THE WORK INDICTAED. PROTECT EXISTING TILES DURING CONSTRUCTION AND REPLACE TILES THAT ARE DAMAGED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS NECESSARY TO PROVIDE THE WORK INDICATED.
3. PERFORM PRE-DEMOLITION TESET AND BALANCE MEASUREMENT OF ALL AIR TERMINAL OUTLETS AND INLETS, AS WELL AS ALL OUTSIDE AIR CONNECTIONS TO FAN COIL UNITS. SUBMIT REPORT TO THE ENGINEER OF RECORD FOR REVIEW.

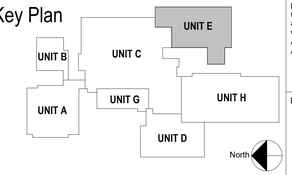
DEMOLITION NOTES: ◯

1. REMOVE EXISTING VRF FAN COIL UNIT, RELATED REFRIGERANT PIPING, TYP.
2. REMOVE PORTION OF EXISTING DUCTWORK INDICATED. PREPARE DUCT FOR NEW CONNECTION.
3. REMOVE EXISTING BRANCH SELECTOR BOX AND RELATED REFRIGERANT PIPING, TYP.
4. REMOVE EXISTING VRF UNIT THERMOSTAT, TYP.
5. REMOVE EXISTING REFRIGERANT MAINS FROM VRF CONDENSING UNIT, TYP.
6. REMOVE EXISTING VRF CONDENSING UNITS.
7. RETURN GRILLE AND EX RETURN RISER TO REMAIN.
8. EXISTING RELIEF AIR DUCT TO REMAIN.
9. REMOVE PORTION OF EXISTING CONDENSATE DRAIN INDICATED, TYP.
10. REMOVE PORTION OF EXISTING OUTSIDE AIR DUCT INDICATED. PREPARE DUCT FOR NEW CONNECTION, TYP.
11. EXISTING ENERGY RECOVERY UNIT TO REMAIN.
12. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 4.
13. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 3.
14. REMOVE EXISTING HEATING HYDRONIC FAN COIL UNIT AND ASSOCIATED CONTROLS COMPLETE.



1 MECHANICAL FIRST FLOOR DEMOLITION - UNIT E
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

Certified By:
DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: **MECHANICAL FIRST FLOOR DEMOLITION PLAN - UNIT E**

Project: **HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT**
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

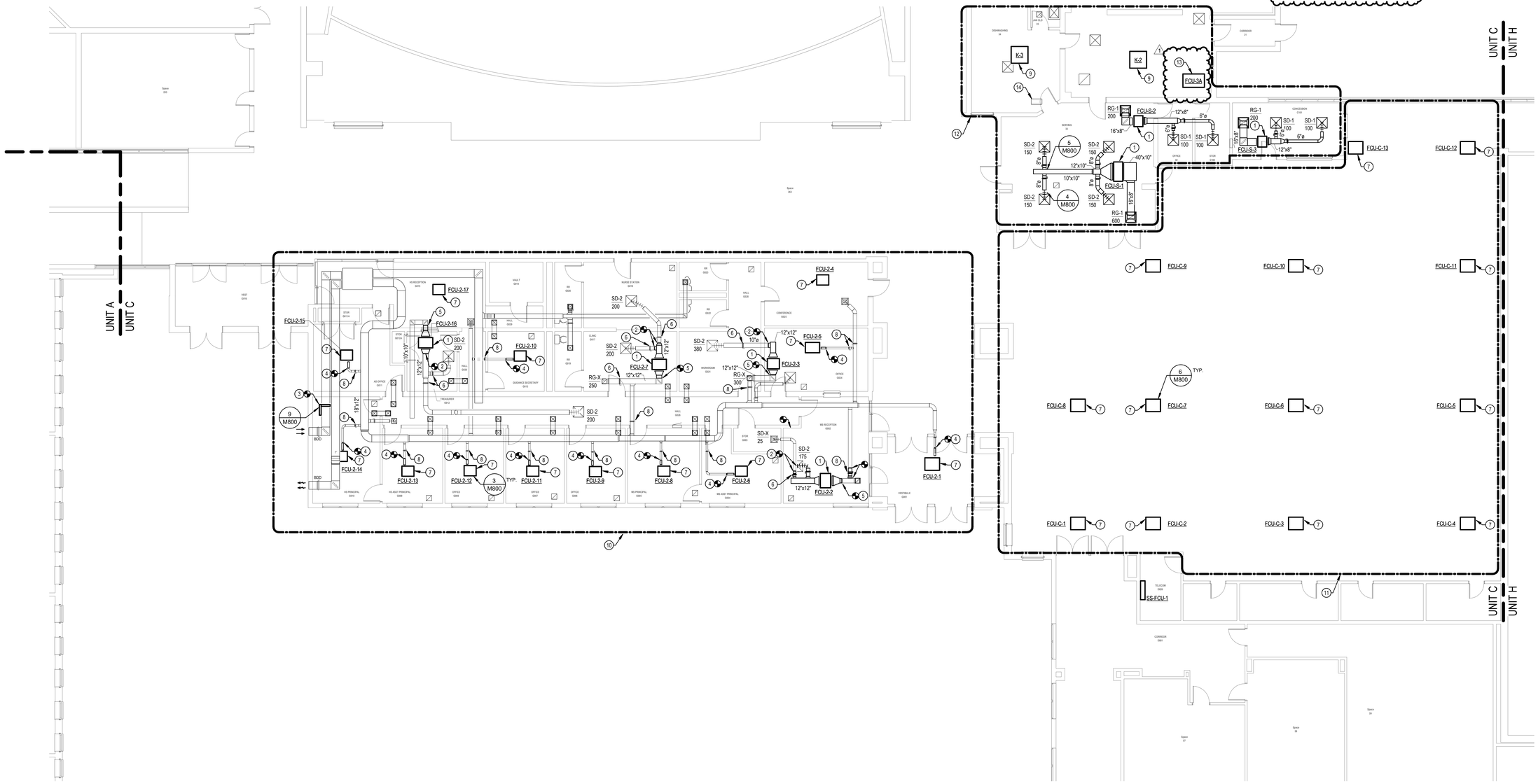
Drawing Number:
M103

GENERAL NOTES:

1. CONTRACTOR SHALL REMOVE AND RE-INSTALL CEILINGS/CEILING TILES AS NECESSARY TO PROVIDE THE WORK INDICTAED. PROTECT EXISTING TILES DURING CONSTRUCTION AND REPLACE TILES THAT ARE DAMAGED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS NECESSARY TO PROVIDE THE WORK INDICATED.

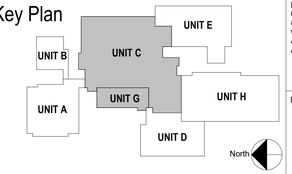
PLAN NOTES: (◯)

1. HYDRONIC FAN COIL UNIT.
2. CONNECT EXISTING DUCT TO NEW SUPPLY MAIN. MATCH EXISTING DUCT DIMENSIONS, TYP.
3. PROVIDE NEW DUCT MOUNTED REHEAT COIL IN EXISTING LOCATION PREVIOUSLY REMOVED.
4. CONNECT OUTSIDE AIR TO EXISTING OUTSIDE AIR MAIN. MATCH EXISTING DUCT DIMENSIONS, TYP.
5. CONNECT RETURN DUCT TO EXISTING RETURN DUCT. MATCH EXISTING DUCT DIMENSIONS, TYP.
6. BALANCE SUPPLY DIFFUSERS AND RETURN GRILLES TO CFM INDICATED, TYP.
7. CASSETTE FAN COIL UNIT. INSTALL IN EXISTING UNIT LOCATION.
8. BALANCE OUTSIDE AIR TO CFM AS SCHEDULED IN THE FAN COIL SCHEDULE ON M600.
9. SPLIT-SYSTEM EVAPORATOR INSTALLED IN CELING.
10. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 1.
11. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 2.
12. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 3.
13. EXISTING FAN COIL UNIT TO REMAIN.
14. EXISTING UNIT HEATER TO REMAIN.
15. FAN COIL UNIT. INSTALL IN EXISTING UNIT LOCATION.



1 MECHANICAL FIRST FLOOR - UNIT C AND G
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

Certified By:
DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: **MECHANICAL FIRST FLOOR PLAN - UNIT C AND G**

Project: **HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT**
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

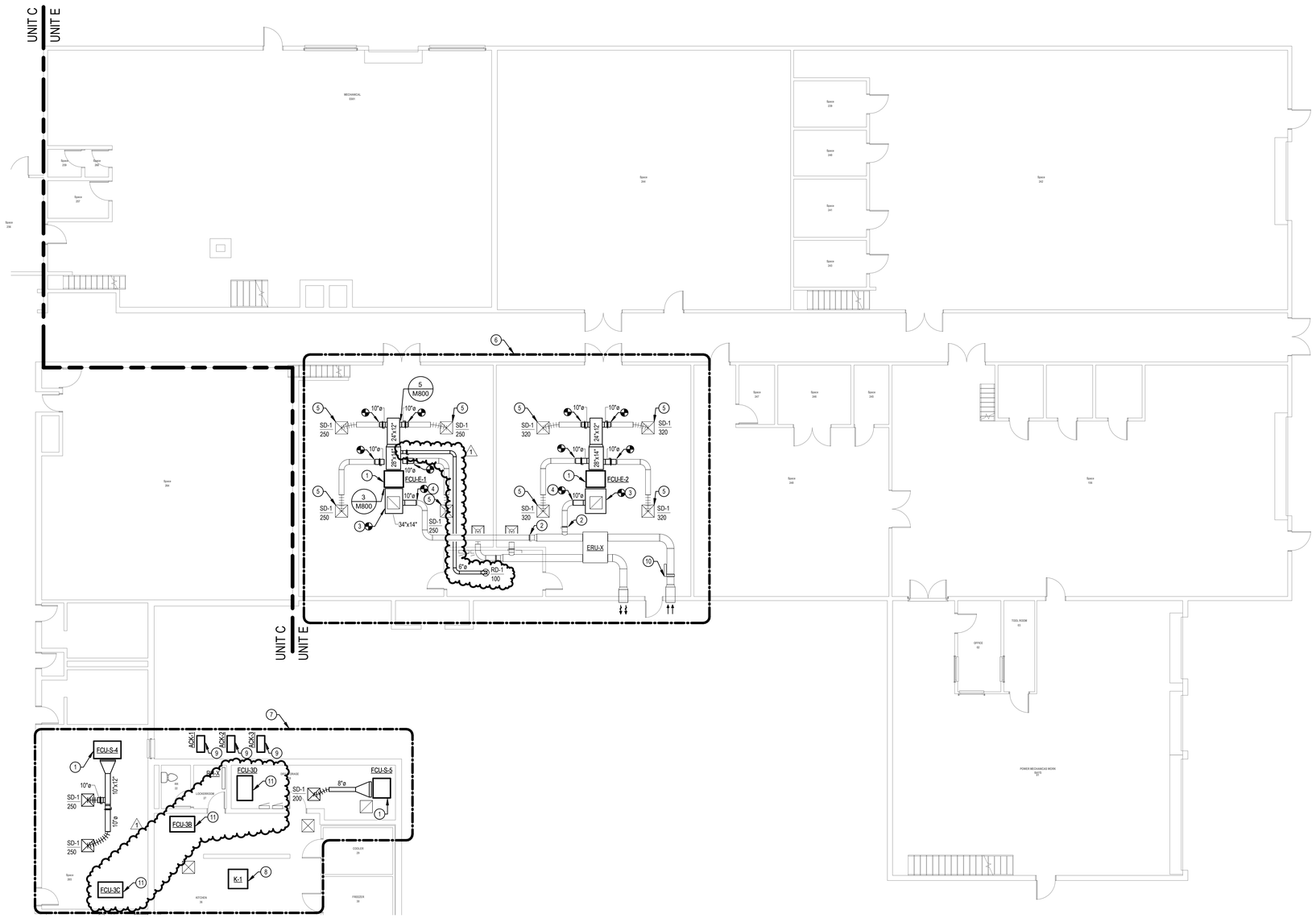
Drawing Number:
M202

GENERAL NOTES:

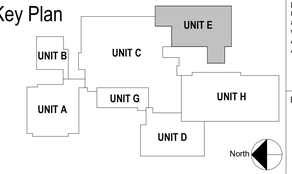
1. CONTRACTOR SHALL REMOVE AND RE-INSTALL CEILINGS/CEILING TILES AS NECESSARY TO PROVIDE THE WORK INDICTAED. PROTECT EXISTING TILES DURING CONSTRUCTION AND REPLACE TILES THAT ARE DAMAGED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS NECESSARY TO PROVIDE THE WORK INDICATED.

PLAN NOTES:

1. HYDRONIC FAN COIL UNIT.
2. BALANCE OUTSIDE AIR TO CFM AS SCHEDULED IN THE FAN COIL SCHEDULE ON M600.
3. CONNECT NEW RETURN MAIN TO EXISTING RETURN, TYP.
4. CONNECT OUTSIDE AIR TO EXISTING OUTSIDE AIR MAIN. MATCH EXISTING DUCT DIMENSIONS, TYP.
5. BALANCE SUPPLY DIFFUSERS AND RETURN GRILLES TO CFM INDICATED, TYP.
6. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 4.
7. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 3.
8. DX REFRIGERANT FAN COIL UNIT.
9. AIR COOLED CONDENSING UNIT.
10. EXISTING DUCT HEATER TO REMAIN.
11. FAN COIL UNIT. INSTALL IN EXISTING UNIT LOCATION.



1 MECHANICAL FIRST FLOOR - UNIT E
1/8" = 1'-0"



ATP ENGINEERING

Certified By:
DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

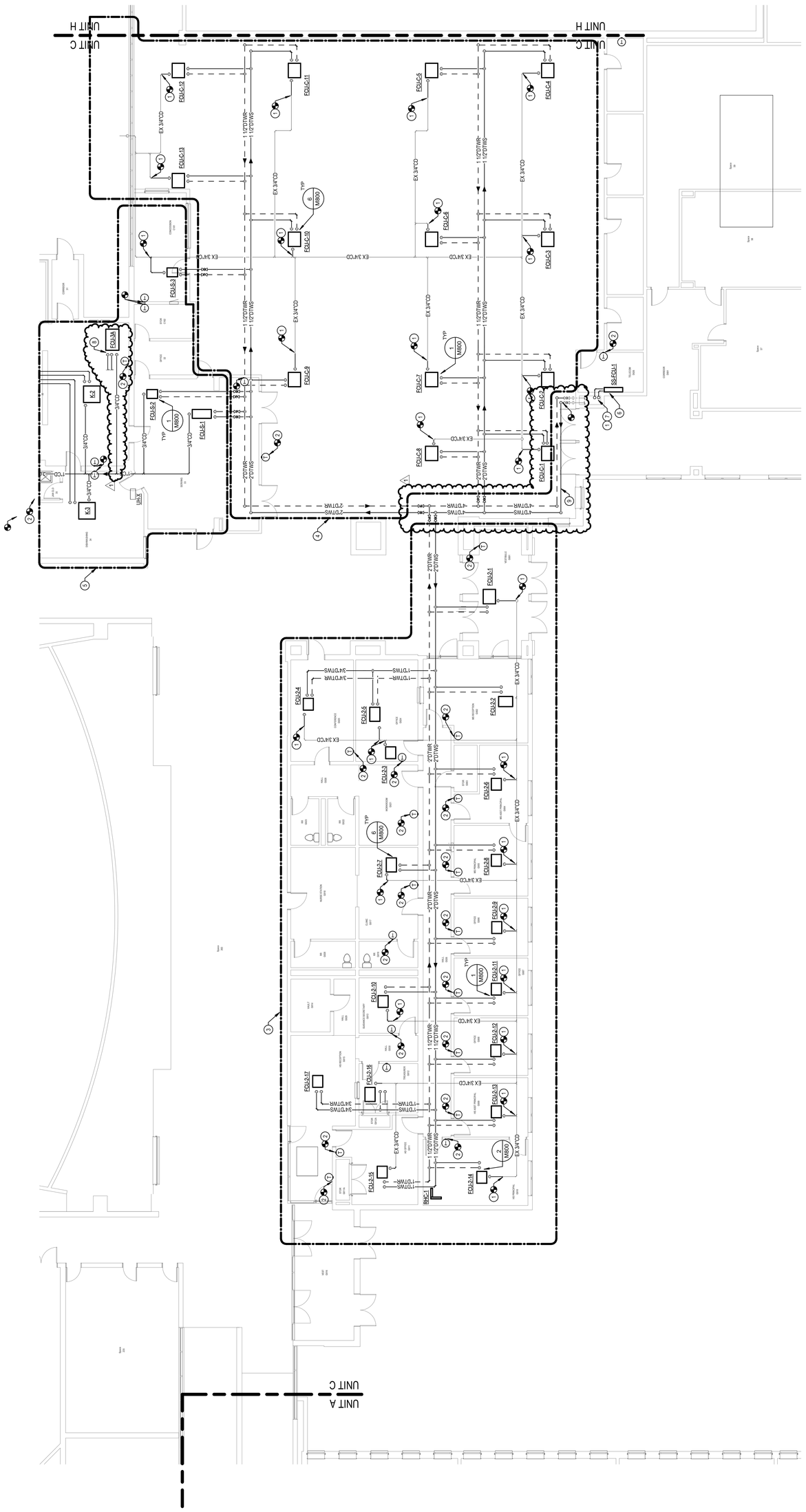
Title: **MECHANICAL FIRST FLOOR PLAN - UNIT E**

Project: **HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT**
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

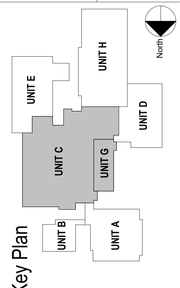
Drawing Number:
M203

PLAN NOTES:

1. CONNECT NEW CONDENSATE TO EXISTING. MATCH EXISTING PIPE SIZE. TYP.
2. SPACE TEMPERATURE SENSOR. INSTALL IN LOCATION WHERE PREVIOUS THERMOSTAT WAS LOCATED.
3. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 1.
4. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 2.
5. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 3.
6. WALL MOUNTED SPLIT SYSTEM FAN COIL UNIT. WORK TO BE INCLUDED IN BASE BID.
7. REFRIGERANT LINE SET UP TO ROOF. WORK TO BE INCLUDED IN BASE BID.
8. CONNECT NEW FAN COIL UNIT TO EXISTING DUAL TEMPERATURE SUPPLY AND RETURN MAINS.
9. THIS PORTION OF 4" DUAL TEMPERATURE WATER MAINS TO BE INCLUDED AS BASE BID SCOPE.



1 MECHANICAL PIPING FIRST FLOOR - UNIT C AND G
1/8" = 1'-0"



Drawing Number: M302

Title: MECHANICAL PIPING FIRST FLOOR PLAN - UNIT C AND G

Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawn By:	AKE
Checked By:	DAB
Project Status:	100% CONSTRUCTION DOCUMENTS
Date:	11.14.2025

Revisions		
Number	Date	Description
1	12/3/25	Addendum 1

Certified By:

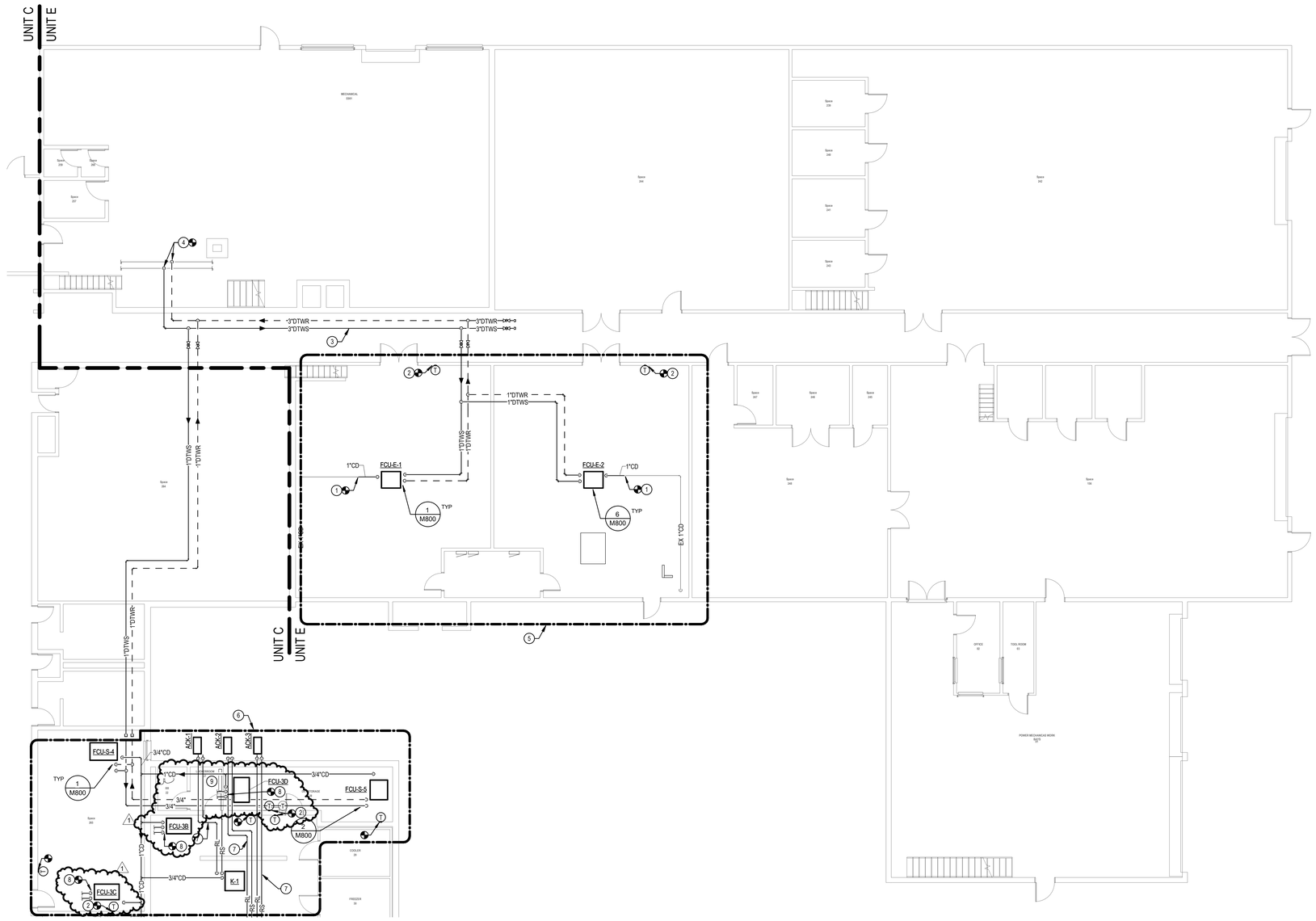
ATP ENGINEERING

GENERAL NOTES:

1. CONTRACTOR SHALL REMOVE AND RE-INSTALL CEILINGS/CEILING TILES AS NECESSARY TO PROVIDE THE WORK INDICTAED. PROTECT EXISTING TILES DURING CONSTRUCTION AND REPLACE TILES THAT ARE DAMAGED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS NECESSARY TO PROVIDE THE WORK INDICATED.
3. PERFORM PRE-DEMOLITION TESET AND BALANCE MEASUREMENT OF ALL AIR TERMINAL OUTLETS AND INLETS, AS WELL AS ALL OUTSIDE AIR CONNECTIONS TO FAN COIL UNITS. SUBMIT REPORT TO THE ENGINEER OF RECORD FOR REVIEW.

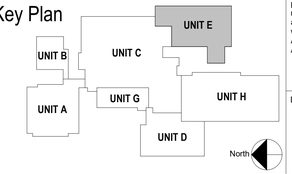
PLAN NOTES:

1. CONNECT NEW CONDENSATE TO EXISTING, MATCH EXISTING PIPE SIZE, TYP.
2. SPACE TEMPERATURE SENSOR. INSTALL IN LOCATION WHERE PREVIOUS THERMOSTAT WAS LOCATED.
3. ROUTE MAINS AS HIGH AS POSSIBLE THROUGH CORRIDOR.
4. CONNECT NEW CWS/CWR MAINS INTO EXISTING CWS/CWR MAINS.
5. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 4.
6. WORK CONTAINED WITHIN THIS AREA TO BE PERFORMED AS PART OF ALTERNATE 3.
7. REFRIGERANT LINE SET. SIZE PER MANUFACTURERS RECOMMENDATION.
8. CONNECT NEW FAN COIL UNIT TO EXSITING DUAL TEMPERATURE SUPPLY AND RETURN MAINS.
9. EXISTING RADIATION HEATER.



1 MECHANICAL PIPING FIRST FLOOR - UNIT E
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

Certified By:
DAVID SHUCK REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION * WINCHESTER INDIANA *

Title: **MECHANICAL PIPING FIRST FLOOR PLAN - UNIT E**

Project: **HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT**
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
M303

GENERAL NOTES:

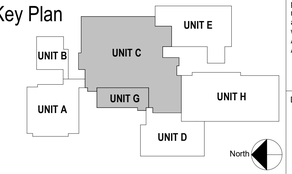
1. CONTRACTOR SHALL REMOVE AND RE-INSTALL CEILINGS/CEILING TILES AS NECESSARY TO PROVIDE THE WORK INDICTAED. PROTECT EXISTING TILES DURING CONSTRUCTION AND REPLACE TILES THAT ARE DAMAGED DURING CONSTRUCTION.
2. CONTRACTOR SHALL CUT AND PATCH EXISTING CONSTRUCTION AS NECESSARY TO PROVIDE THE WORK INDICATED.
3. PERFORM PRE-DEMOLITION TESET AND BALANCE MEASUREMENT OF ALL AIR TERMINAL OUTLETS AND INLETS, AS WELL AS ALL OUTSIDE AIR CONNECTIONS TO FAN COIL UNITS. SUBMIT REPORT TO THE ENGINEER OF RECORD FOR REVIEW.

PLAN NOTES:

1. AIR-COOLED CONDENSING UNIT MOUNTED ON SUPPORTS.
2. REFRIGERANT LINE SET THROUGH PIPING CHASE.
3. REFRIGERANT LINE SET. SIZE PER MANUFACTURERS RECOMMENDATIONS.
4. PRE-MANUFACTURED EQUIPMENT SUPPORT.
5. REPLACE EXISTING SECTION OF OUTSIDE AIR DUCT ON ROOF WITH NEW DUCT. INSULATE AND PROVIDE METAL JACKET PER SPECIFICATIONS. RE-USE EXISTING ROOF SUPPORTS.

1 MECHANICAL SECOND FLOOR - UNIT C AND G
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

Certified By:

DAVID SHUPE
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: **MECHANICAL PIPING SECOND FLOOR PLAN - UNIT C AND G**

Project:
HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
M304

FAN COIL UNIT SCHEDULE

			FAN DATA			COOLING COIL DATA								HEATING COIL DATA								ELECTRICAL DATA									
TAG	TYPE	AREA SERVED	OUTSIDE AIR (CFM)	SUPPLY AIR (CFM)	ESP (IN WG)	WATER PIPING RUNOUT SIZE (IN)	GPM	MAX PD (FT WG)	CAPACITY (MBH)	EAT DB/WB (°F)	LAT (°F)	EWT (°F)	LWT (°F)	ROWS	GPM	MAX PD (FT WG)	CAPACITY (MBH)	EAT DB (°F)	LAT (°F)	EWT (°F)	LWT (°F)	ROWS	NUMBER OF MOTORS	AMPS	HP	MCA	MOP	PHASE	VOLTS	MANUFACTURER	MODEL	REMARKS
FCU-2-1	CASSETTE	G001 VESTIBULE	30	550	-	3/4"	2.3	2.3"	13.6	77º / 64º	57.8º / 56.1º	45º	57º	3	2.3	2.1"	33.2	62º	116.7º	140º	110º	3	1	0.65	0.03	0.8	1	1	208	IEC	MHCFC4W-08	1, 2, 3, 5, 6, 7, 8
FCU-2-2	DUCTED/CONCEALED	G002 RECEPTION	20	200	0.5"	3/4"	0.75	0.1"	5.1	77º / 64º	56.7º / 55.5º	45º	59º	4	0.75	0.1"	11.0	62º	112º	140º	109º	4	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 4, 5, 6, 7, 8
FCU-2-3	CASSETTE	G027 CONFERENCE	80	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-4	CASSETTE	G025 OFFICE	20	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-5	DUCTED/CONCEALED	G021 WORKROOM	50	400	0.5"	3/4"	1.5	2.0"	9.8	77º / 64º	57.4º / 55.8º	45º	59º	2	1.5	1.7"	22.5	62º	113º	140º	108º	4	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 5, 6, 7, 8
FCU-2-6	CASSETTE	G004 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-7	DUCTED/CONCEALED	G017 / G018 CLINIC	150	400	0.5"	3/4"	1.5	2.0"	9.8	77º / 64º	57.4º / 55.8º	45º	59º	4	1.5	1.7"	22.5	62º	113º	140º	108º	4	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 4, 5, 6, 7, 8
FCU-2-8	CASSETTE	G005 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-9	CASSETTE	G006 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-10	CASSETTE	G013 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-11	CASSETTE	G007 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-12	CASSETTE	G008 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-13	CASSETTE	G009 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-14	CASSETTE	G010 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-15	CASSETTE	G011 OFFICE	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-2-16	DUCTED/CONCEALED	G012 OFFICE	40	400	0.5"	3/4"	1.5	2.0"	9.8	77º / 64º	57.4º / 55.8º	45º	59º	2	1.5	1.7"	22.5	62º	113º	140º	108º	4	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 4, 5, 6, 7, 8
FCU-2-17	CASSETTE	G014 RECEPTION	40	380	-	3/4"	2.3	9.6"	10	77º / 64º	57.8º / 55.5º	45º	54º	2	2.3	8.4"	23.1	62º	117º	140º	120º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFW-04	1, 2, 3, 5, 6, 7, 8
FCU-3A	HORIZONTAL CABINET	KITCHEN	-	450	-	3/4"	2.0	2.3'	10.4	76º / 63.3º	57.6º / 55.5º	45º	55º	3	2.0	2.7"	26.2	62º	114º	140º	120º	3	1	1.3	0.17	1.6	15	1	208	IEC	CXB06	1, 2, 5, 6, 7, 8, 9
FCU-3B	HORIZONTAL CABINET	KITCHEN	-	450	-	3/4"	2.0	2.3'	10.4	76º / 63.3º	57.6º / 55.5º	45º	55º	3	2.0	2.7"	26.2	62º	114º	140º	120º	3	1	1.3	0.17	1.6	15	1	208	IEC	CXB06	1, 2, 5, 6, 7, 8, 9
FCU-3C	HORIZONTAL CABINET	CAFETERIA OFFICE	-	450	-	3/4"	2.0	2.3'	10.4	76º / 63.3º	57.6º / 55.5º	45º	55º	3	2.00	2.7"	26.2	62º	114º	140º	120º	3	1	1.3	0.17	1.6	15	1	208	IEC	CXB06	1, 2, 5, 6, 7, 8, 9
FCU-3D	HORIZONTAL CABINET	DRY STORAGE	-	300	-	3/4"	1.4	5.1'	6.9	76º / 63.3º	57.9º / 55.8º	45º	55º	3	1.7	5.8'	16.9	62º	112º	140º	120º	3	1	0.9	0.14	1.1	15	1	208	IEC	CXB03	1, 2, 5, 6, 7, 8, 9
FCU-B-1-1	DUCTED/CONCEALED	001 SCIENCE	575	1,650	0.5"	1"	4.8	1.5	32.7	76º / 63.3º	57.9º / 56.1º	45º	59º	4	4.8	1.2	83.1	62º	108º	140º	106º	4	2	6.5	0.5	7.3	15	1	208	IEC	HPY16	1, 2, 3, 4, 5, 6, 7, 8
FCU-B-1-2	DUCTED/CONCEALED	003 SCIENCE	575	1,650	0.5"	1"	4.8	1.5	32.7	76º / 63.3º	57.9º / 56.1º	45º	59º	4	4.8	1.2	83.1	62º	108º	140º	106º	4	2	6.5	0.5	7.3	15	1	208	IEC	HPY16	1, 2, 3, 4, 5, 6, 7, 8
FCU-B-1-3	DUCTED/CONCEALED	B010 SCIENCE	600	1,650	0.5"	1"	4.8	1.5	32.7	76º / 63.3º	57.9º / 56.1º	45	59º	4	4.8	1.2	83.1	62º	108º	140º	106º	4	2	6.5	0.5	7.3	15	1	208	IEC	HPY16	1, 2, 3, 4, 5, 6, 7, 8
FCU-B-1-4	DUCTED/CONCEALED	005 PREP ROOM AND STORAGE	55	700	0.5"	3/4"	2.2	1.6	15.3	76º / 63.3º	57.4º / 55.7º	45º	59º	4	2.2	1.3	36.7	62º	109º	140º	105º	4	1	2.4	0.5	3	15	1	208	IEC	HPY08	1, 2, 3, 4, 5, 6, 7, 8
FCU-B-1-5	CASSETTE	B011 HALL	35	300	-	3/4"	2.1	8.2	9.1	76º / 63.3º	57.9º / 55.1º	45º	54º	2	2.1	6.8	22.6	62º	115º	140º	118º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFC4W-04-01	1, 2, 3, 5, 6, 7, 8
FCU-B-1-6	DUCTED/CONCEALED	B002 SCIENCE	575	1,650	0.5"	1"	4.8	1.5	32.7	76º / 63.3º	57.9º / 56.1º	45º	59º	4	4.8	1.2	83.1	62º	108º	140º	106º	4	2	6.5	0.5	7.3	15	1	208	IEC	HPY16	1, 2, 3, 4, 5, 6, 7, 8
FCU-B-1-7	CASSETTE	B004 OFFICE	35	320	-	3/4"	2.1	8.2	9.1	76º / 63.3º	57.5º / 55.1º	45º	54º	2	2.1	6.8	22.6	62º	115º	140º	118º	2	1	0.4	0.03	0.5	1	1	208	IEC	MHCFC4W-04-01	1, 2, 3, 5, 6, 7, 8
FCU-B-1-8	DUCTED/CONCEALED	B006 SCIENCE	605	1,650	0.5"	1"	4.8	1.5	32.7	76º / 63.3º	57.9º / 56.1º	45º	59º	4	4.8	1.2	83.1	62º	108º	140º	106º	4	2	6.5	0.5	7.3	15	1	208	IEC	HPY16	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-1	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-2	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-3	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-4	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-5	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-6	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-7	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-8	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-9	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-10	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-11	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-12	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-C-13	CASSETTE	CAFETERIA	-	870	-	1"	3.6	7.2'	20.7	76º / 63º	57.4º / 55.3º	45º	57º	3	3.6	3.0'	31.6	62º	95º	140º	122º	3	1	1.5	0.125	1.9	3	1	208	IEC	MHCFC4W-12	1, 2, 3, 4, 5, 6, 7, 8
FCU-E-1	DUCTED/CONCEALED	CLASSROOM E001	435	1,200	0.5"	1"	4.9	1.2'	34.2	79º / 66º	57.5º / 56.8º	45º	59º	6	4.9	1'	75.6	62º	119º	140º	109º	6	2	3.7	0.5	4.2	15	1	208	IEC	HPY12	1, 2, 3, 4, 5, 6, 7, 8
FCU-E-2	DUCTED/CONCEALED	CLASSROOM E002	435	1,280	0.5"	1"	5.2	1.3'	36.3	79º / 66º	57.6º / 56.9º	45º	59º	6	5.2	1.1'	80.0	62º	118º	140º	109º	6	2	3.7	0.5	4.2	15	1	208	IEC	HPY12	1, 2, 3, 4, 5, 6, 7, 8
FCU-S-1	DUCTED/CONCEALED	SERVING 133	-	650	0.5"	1"	4.0	1.7'	14.8	76º / 63º	56.9º / 55.3º	45º	57º	4	4.0	2.9'	39.1	62º	116º	140º	120º	4	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 5, 6, 7, 8
FCU-S-2	DUCTED/CONCEALED	OFFICE 32 / STOR C102	-	1500	0.5"	3/4"	1.0	0.1'	3.7	76º / 63º	56.1º / 54.7º	45º	57º	3	1.0	0.1'	9.1	62º	117º	140º	120º	3	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 5, 6, 7, 8
FCU-S-3	DUCTED/CONCEALED	CONCESSION C101	-	200	0.5"	3/4"	1.0	0.1'	4.5	76º / 63º	57.1º / 55.5º	45º	57º	3	1.2	0.2'	11.8	62º	115º	140º	120º	3	1	2.1	0.5	2.6	15	1	208	IEC	HPY06	1, 2, 3, 5, 6, 7, 8
FCU-S-4	HORIZONTAL TELESCOPING	CAFETERIA OFFICE	-	500	0.5"	1"	2.0	1.1'	10.9	76º / 63º	57.4º / 55.7º	45º	57º	4	3.0	1.9'	29.8	62º	116º	140º	120º	4	1	2.1	0.5	2.6	15	1	208	IEC	CBY06	1, 2, 3, 5, 6, 7, 8
FCU-S-5	HORIZONTAL TELESCOPING	DRY STORAGE	-	200	0.5"	3/4"	1.0	0.1'	4.5	76º / 63º	57.1º / 55.5º	45º	57º	3	1.2	0.2'	11.8	62º	115º	140º	120º	3	1	2.1	0.5	2.6	15	1	208	IEC	CBY08	1, 2, 3, 5, 6, 7, 8

REMARKS:
1. PROVIDE DISCONNECT.
2. PROVIDE VIBRATION ISOLATION.
3. BALANCE THE OUTSIDE AIR TO THE VALUE SCHEDULED FOR EACH UNIT.
4. PROVIDE UNIT WITH FILTER FRAME AND NO FILTER. EXISTING RETURN AIR GRILLE IS A FILTER TYPE GRILLE.
5. PROVIDE CONDENSATE HIGH LIMIT SWITCH.
6. PROVIDE WITH EC MOTOR WITH MANUAL SPEED CONTROL.
7. PROVIDE CONDENSATE PUMP. CONDENSATE PUMP SHALL BE LITTLE GIANT MODEL VCMA-20UL PROVIR APPROVED EQUAL. COORDINATE ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
8. TOP FLOW DISCHARGE UNLESS OTHERWISE NOTED.
9. BOTTOM RETURN / FRONT SUPPLY.

GRILLE/REGISTER AND DIFFUSER SCHEDULE

TAG	FACE SIZE (IN)	SQUARE NECK SIZE (IN)	ROUND NECK SIZE (IN)	MAX CFM	MAX NC (AT MAX CFM)	MATERIAL	FINISH	TYPE	MANUFACTURER	MODEL	REMARKS
RD-1	13 1/2" Ø	-	6" Ø	170	25	STEEL	WHITE	CONE	PRICE	RCD	1
RG-1	24x24	22x22	-	350	25	ALUMINUM	WHITE	EGGCRATE	PRICE	350RG	2, 3
SD-1	24x24	-	6" Ø	210	25	STEEL	WHITE	CONE	PRICE	ASCD	1, 3
SD-2	24x24	-	8" Ø	350	25	STEEL	WHITE	CONE	PRICE	ASCD	1, 3

REMARKS:
1. ROUND DUCT SIZES TO DIFFUSERS SHALL MATCH ROUND NECK SIZE, UNLESS NOTED OTHERWISE.
2. WHERE DIFFUSER/GRILLE IS INSTALLED IN LAY-IN CEILING, PROVIDE LAY-IN CEILING BORDER WITH A 24"x24" OR 24"x12" PANEL AS REQUIRED TO MATCH SIZE SCHEDULED.
3. COORDINATE LOCATION OF GRILLES AND DIFFUSERS WITH EXISTING LAY-IN CEILING.

ELECTRIC DUCT COIL SCHEDULE

TAG	LOCATION	CFM	CAPACITY (KW)	HEIGHT	WIDTH	EAT (°F)	LAT (°F)	ELECTRICAL DATA PHASE	ELECTRICAL DATA VOLTS	MODEL	MANUFACTURER	REMARKS
RHC-1	AD OFFICE G011	1,100	20.0	1'-0"	1'-6"	-10º	45º	208	3	QUIZ	INDEECO	1, 2, 3, 4

REMARKS:
1. PROVIDE WITH DISCONNECT.
2. PROVIDE WITH HIGH-LIMIT TEMPERATURE SWITCH.
3. PROVIDE WITH THERMOSTAT.
4. PROVIDE WITH SCR CONTROL.

SPLIT SYSTEM FAN UNIT SCHEDULE

TAG	LOCATION	TYPE	AIRFLOW (CFM)	COOLING DATA TOTAL CAPACITY (MBH)	HEATING DATA HEATING CAPACITY (MBH)	MANUFACTURER	MODEL	REMARKS
K-1	DISHWASHING	CEILING CASSETTE	450	12.0	-	MITSHUBISHI	PLA-AE12NL	-
K-2	KITCHEN	CEILING CASSETTE	650	18.0	-	MITSHUBISHI	PLA-AE18NL	-
K-3	KITCHEN	CEILING CASSETTE	650	18.0	-	MITCHUBISHI	PLA-AE18NL	-
SS-FCU-1	DATA CLOSET	WALL MOUNTED	255	12.0	-	MITCHUBISHI	PKA-AL12NL	-

SPLIT SYSTEM CONDENSING UNIT SCHEDULE

TAG	LOCATION	OUTDOOR DESIGN DATA SUMMER AMBIENT TEMPERATURE (°F)	OUTDOOR DESIGN DATA WINTER AMBIENT TEMPERATURE (°F)	REFRIGERANT	MINIMUM EFFICIENCY (SEER)	ELECTRICAL DATA MCA	ELECTRICAL DATA MOP	ELECTRICAL DATA VOLTS	ELECTRICAL DATA PHASE	MANUFACTURER	MODEL	REMARKS
ACK-1	MECHANICAL YARD	92º	23º	R454B	24.8	16	27	208	1	MITSUBISHI	PUY-AK12NL	1, 2, 3
ACK-2	MECHANICAL YARD	92º	23º	R454B	24.7	16	27	208	1	MITSUBISHI	PUY-AK18NL	1, 2, 3
ACK-3	MECHANICAL YARD	92º	23º	R454B	24.7	16	27	208	1	MITSUBISHI	PUY-AK18NL	1, 2, 3
SS-ACC-1	ROOF MOUNTED	92º	23º	R454B	24.8	16	27	208	1	MITSUBISHI	PUY-AK12NL	1, 2, 3

REMARKS:
1. PROVIDE WITH DISCONNECT.
2. PROVIDE WITH LOW AMBIENT KIT
3. PROVIDE EQUIPMENT RAIL SUPPORTS.

ATP ENGINEERING

DAVID SHUPE REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER
Certified By:

Revisions

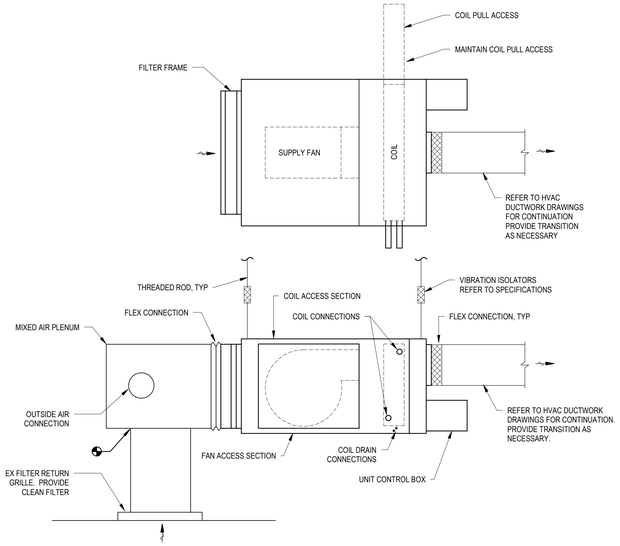
Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

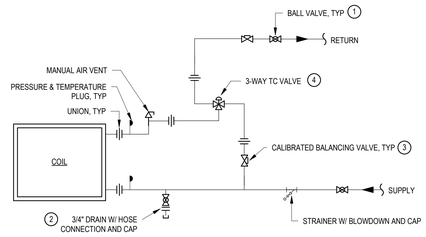
RANDOLPH CENTRAL SCHOOL CORPORATION * WINCHESTER INDIANA * NOLLVILLE

Title: MECHANICAL SCHEDULES
Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number: M600



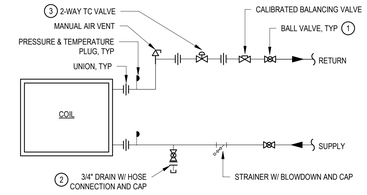
3 FAN COIL UNIT DETAIL
NO SCALE



NOTES:

1. PROVIDE BUTTERFLY VALVES IN LIEU OF BALL VALVES WHEN PIPE SIZES ARE ABOVE 2", TYP.
2. INSTALL AT LOWEST POINT IN PIPING BETWEEN BYPASS AND COIL.
3. SET PRESSURE DROP ACROSS BYPASS CALIBRATED BALANCING VALVE TO MATCH COIL FULL FLOW PRESSURE DROP.
4. INSTALL TC VALVE SO THAT STEM IS VERTICAL.

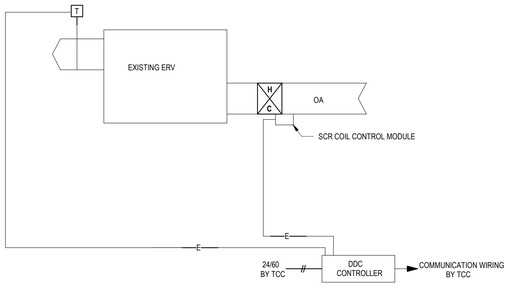
2 3-WAY WATER COIL PIPING DETAIL
NO SCALE



NOTES:

1. PROVIDE BUTTERFLY VALVES IN LIEU OF BALL VALVES WHEN PIPE SIZES ARE ABOVE 2", TYP.
2. INSTALL AT LOWEST POINT IN PIPING.
3. INSTALL TC VALVE SO THAT STEM IS VERTICAL.

1 2-WAY WATER COIL PIPING DETAIL
NO SCALE



INSTRUMENTATION POINTS

ANALOG INPUT

AI-1 DISCHARGE AIR TEMPERATURE
AI-2 OUTSIDE AIR TEMPERATURE

BINARY INPUT

BI-1 FAN STATUS

ANALOG OUTPUT

AO-1 SCR PREHEAT COIL OUTPUT

BINARY OUTPUT

BO-1 VENTILATOR ENABLED/DISABLED

BACNET COMMUNICATION POINTS

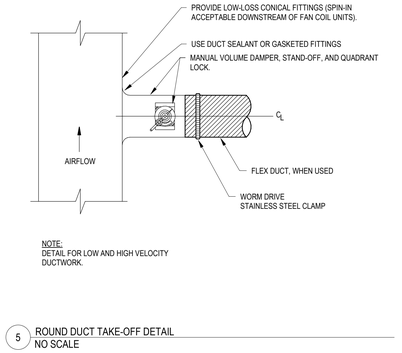
C-1 HEATING/COOLING MODE

SEQUENCE OF OPERATION

A. PROVIDE ADDITIONAL POINTS AND/OR REPLACE EXISTING CONTROLLER AS REQUIRED TO CONTROL THE ELECTRIC PREHEAT COIL AND VENTILATOR. THE ENERGY RECOVERY VENTILATOR IS EXISTING AND CONSISTS OF SUPPLY FAN, EXHAUST FAN AND CROSSFLOW HEAT EXCHANGER UNDER EXISTING BMS CONTROL. THE SYSTEM SHALL FUNCTION AS A COMPLETE ASSEMBLY TO CONTROL VENTILATION AND SUPPLY AIR TEMPERATURE AS INDICATED.
   1. OCCUPIED MODE: THE VENTILATOR FANS SHALL BE ON..
   2. UNOCCUPIED MODE: THE VENTILATOR FANS SHALL BE OFF.

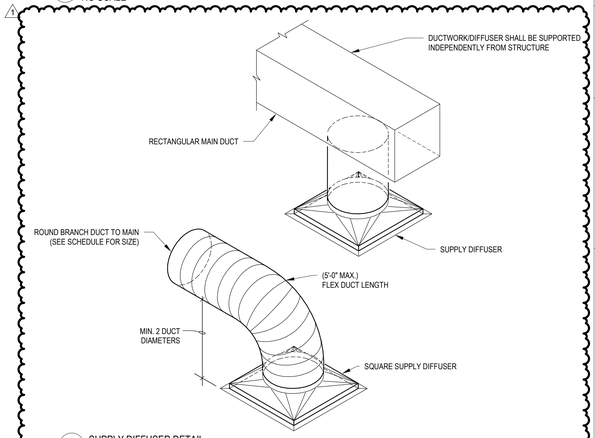
B. ELECTRIC REHEAT COIL CONTROL: WHEN THE VENTILATOR FAN IS ON AND THE SYSTEM IS IN HEATING MODE, THE BMS SHALL PROVIDE A MODULATING SIGNAL TO THE ELECTRIC COIL SCR CONTROLLER TO MAINTAIN A SUPPLY AIR DISCHARGE TEMEPRATURE OF 68 DEG. F.
   1. THE ELECTRIC COIL SHALL BE FURNISHED WITH INTEGRAL THERMAL CUTOUT AND AIRFLOW PROVIING SWITCH.

9 ELECTRIC REHEAT COIL CONTROL SCHEMATIC
NO SCALE

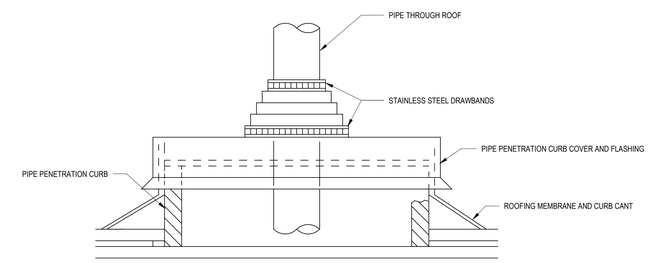


NOTE:
DETAIL FOR LOW AND HIGH VELOCITY DUCTWORK.

5 ROUND DUCT TAKE-OFF DETAIL
NO SCALE

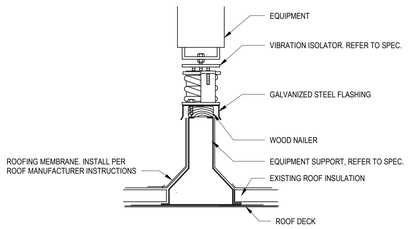


4 SUPPLY DIFFUSER DETAIL
NO SCALE

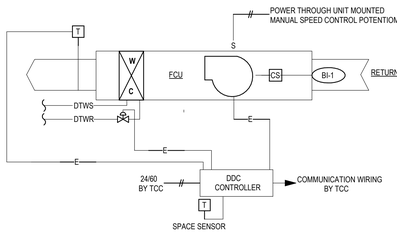


NOTE: VERIFY WITH OWNER THAT ALL ROOF WORK IS DONE IN ACCORDANCE WITH THE ANY ROOF ALTERATION WARRANTY REQUIREMENTS.

8 PIPE PENETRATION CURB DETAIL
NO SCALE



7 ROOFTOP EQUIPMENT SUPPORT DETAIL
NO SCALE



INSTRUMENTATION POINTS

ANALOG INPUT

AI-1 DISCHARGE AIR TEMPERATURE
AI-2 SPACE TEMPERATURE

BINARY INPUT

BI-1 FAN STATUS
BI-2 CONDENSATE OVERFLOW SWITCH

ANALOG OUTPUT

AO-1 CHILLED WATER VALVE POSITION
AO-2 HOT WATER VALVE POSITION

BINARY OUTPUT

BO-1 FAN ON/OFF

BACNET COMMUNICATION POINTS

C-1 HEATING/COOLING MODE
C-2 OCCUPIED/UNOCCUPIED
C-3 SPACE HEATING TEMPERATURE SETPOINT
C-4 SPACE COOLING TEMPERATURE SETPOINT

SEQUENCE OF OPERATION

A. PROVIDE A SCHEDULED OCCUPANCY MODE FOR EACH AREA THAT WILL APPLY TO EACH FAN COIL UNIT.
   1. OCCUPIED MODE: THE FAN SHALL RUN CONTINUOUSLY WHEN IN OCCUPIED MODE. IF THE CURRENT STATUS SWITCH DOES NOT PROVDE OPERATION, SEND AN ALARM TO THE DDC INTERFACE.
   2. UNOCCUPIED MODE: FAN SHALL CYCLE TO MAINTAIN SPACE TEMPERATURE SETPOINT.

B. FAN SPEED CONTROL: THE UNIT SHALL BE PROVIDED WITH A MANUAL EC MOTOR SPEED CONTROL THAT SHALL BE ADJUSTED BY THE TESTING, ADJUSTING AND BALANCING CONTRACTOR.

C. COOLING/HEATING MODE CHANGEOVER
   1. THE BMS SHALL SEND A SIGNAL TO THE FAN COIL UNIT CONTROLLER TO INDICATE WHETHER THE SYSTEM IS IN COOLING OR HEATING MODE. IF COMMUNICATION WITH THE CENTRAL SYSTEM FAILS, THE UNIT SHALL DEFAULT TO THE MOST RECENT MODE
   2. COOLING MODE: ON A CALL FOR COOLING, THE WATER CONTROL VALVE SHALL MODULATE OPEN UNIT SETPOINT IS MAINTAINED OR UNTIL IT IS FULLY OPEN.
      a. CONDENSATE OVERFLOW SWITCH: PROVIDE A CONDENSATE OVERFLOW SWITCH THAT WILL SHUT DOWN THE FAN ANC CLOSE THE CONTROL VALVE IF A HIGH LEVEL OF CONDENSATE IS DETECTED.
   3. HEATING MODE: ON A CALL FOR HEATING, THE WATER CONTROL VALVE SHALL MODULATE OPEN UNITL SETPOIN IS MAINTAINED, OR UNTIL IT IS FULLY OPEN.
   4. PROVIDE SEPARATE HEATING/COOLING MODE SETPOINTS. SETPOINTS SHALL BE ADJUSTABLE AT THE CENTRAL WORKSTATION, AND SHALL BE ADJUSTABLE TO +/- 2 DEGREE FROM THE CENTRAL SETPOINT AT THE LOCAL ZONE SENSOR

6 FCU WITH DDC CONTROLS CONTROL SCHEMATIC
NO SCALE

ATP ENGINEERING

Certified By:
DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: AKE
Checked By: DAB
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: MECHANICAL DETAILS
Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
M800

GENERAL NOTES

A. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES AS INDICATED UNLESS OTHERWISE NOTED. REMOVE EXISTING WIRING BACK TO SOURCE OR NEAREST JUNCTION BOXES THAT REMAIN. REMOVAL OF EQUIPMENT AND DEVICES SHALL BE COMPLETE.

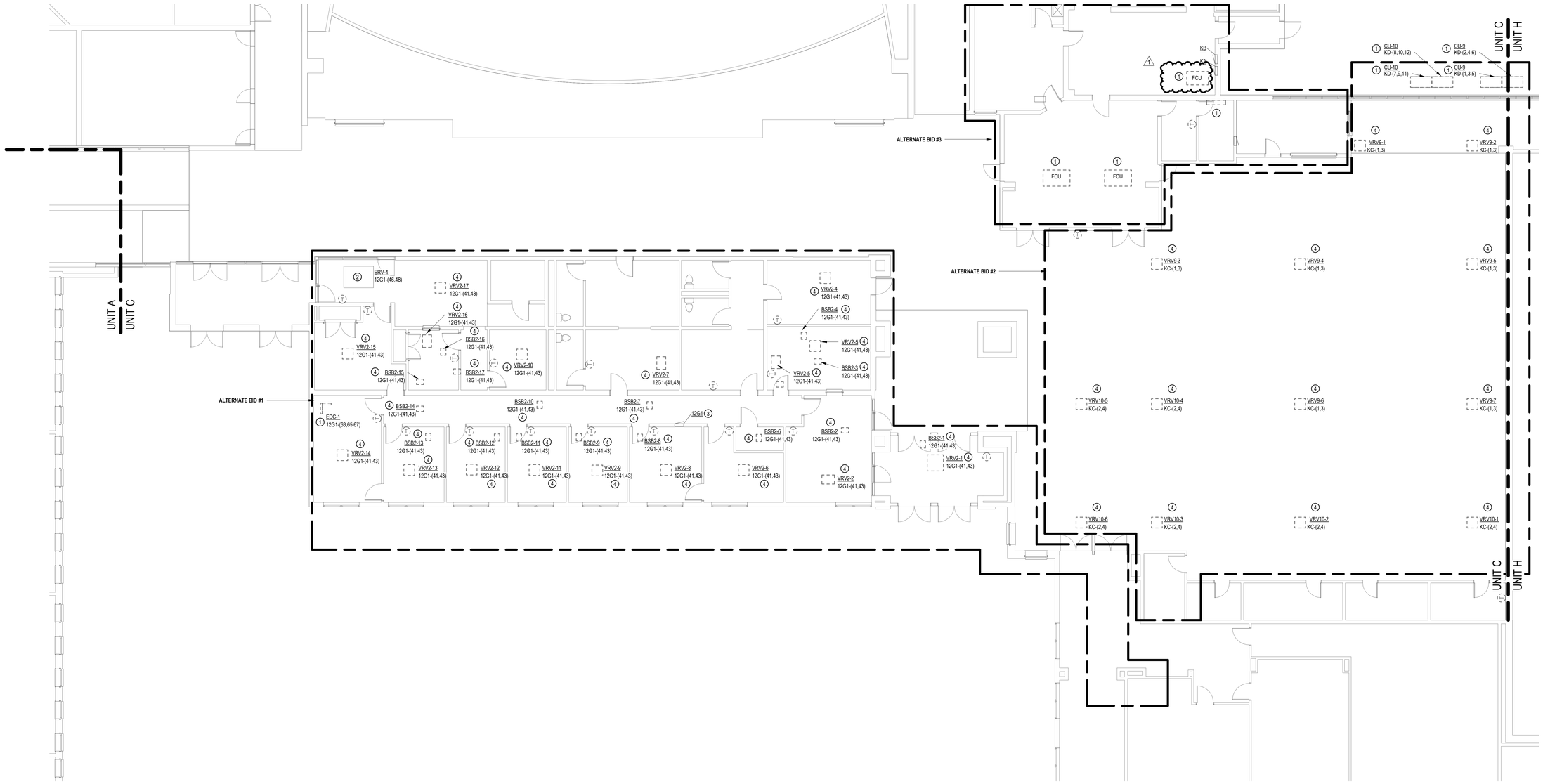
B. COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND THE OTHER TRADES ON THE PROJECT.

C. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROPERLY DISPOSING OF ALL REMOVED ELECTRICAL MANTERIALS AND EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES.

D. PROTECT ALL EXISTING FINISHES, EQUIPMENT, AND DEVICES DURING DEMOLITION WORK THAT ARE TO REMAIN.

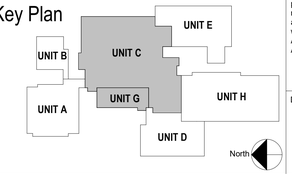
PLAN NOTES

1 DISCONNECT UNIT AND REMOVE ALL ASSOCIATED DEVICES. REMOVE CONDUCTORS AND RACEWAY BACK TO SOURCE.
2 EXISTING UNIT TO REMAIN.
3 EXISTING PANEL.
4 DISCONNECT UNIT AND REMOVE ASSOCIATED DEVICES. TERMINATE CIRCUIT BACK TO NEAREST ACCESSIBLE JUNCTION BOX. CIRCUIT TO REMAIN FOR REUSE.



1 ELECTRICAL FIRST FLOOR DEMOLITION - UNIT C AND G
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

DAVID SHUPE REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER
Certified By:

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: bia
Checked By: DSS
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: ELECTRICAL FIRST FLOOR DEMOLITION PLAN - UNIT C AND G

Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number: E102

Autodesk Docs://Randolph School Corp - HS HVAC Eq Replacement/Randolph SC HS HVAC EQ Upgrade V24.rvt
12/3/2025 2:22:48 PM

GENERAL NOTES

A. DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES AS INDICATED UNLESS OTHERWISE NOTED. REMOVE EXISTING WIRING BACK TO SOURCE OR NEAREST JUNCTION BOXES THAT REMAIN. REMOVAL OF EQUIPMENT AND DEVICES SHALL BE COMPLETE.

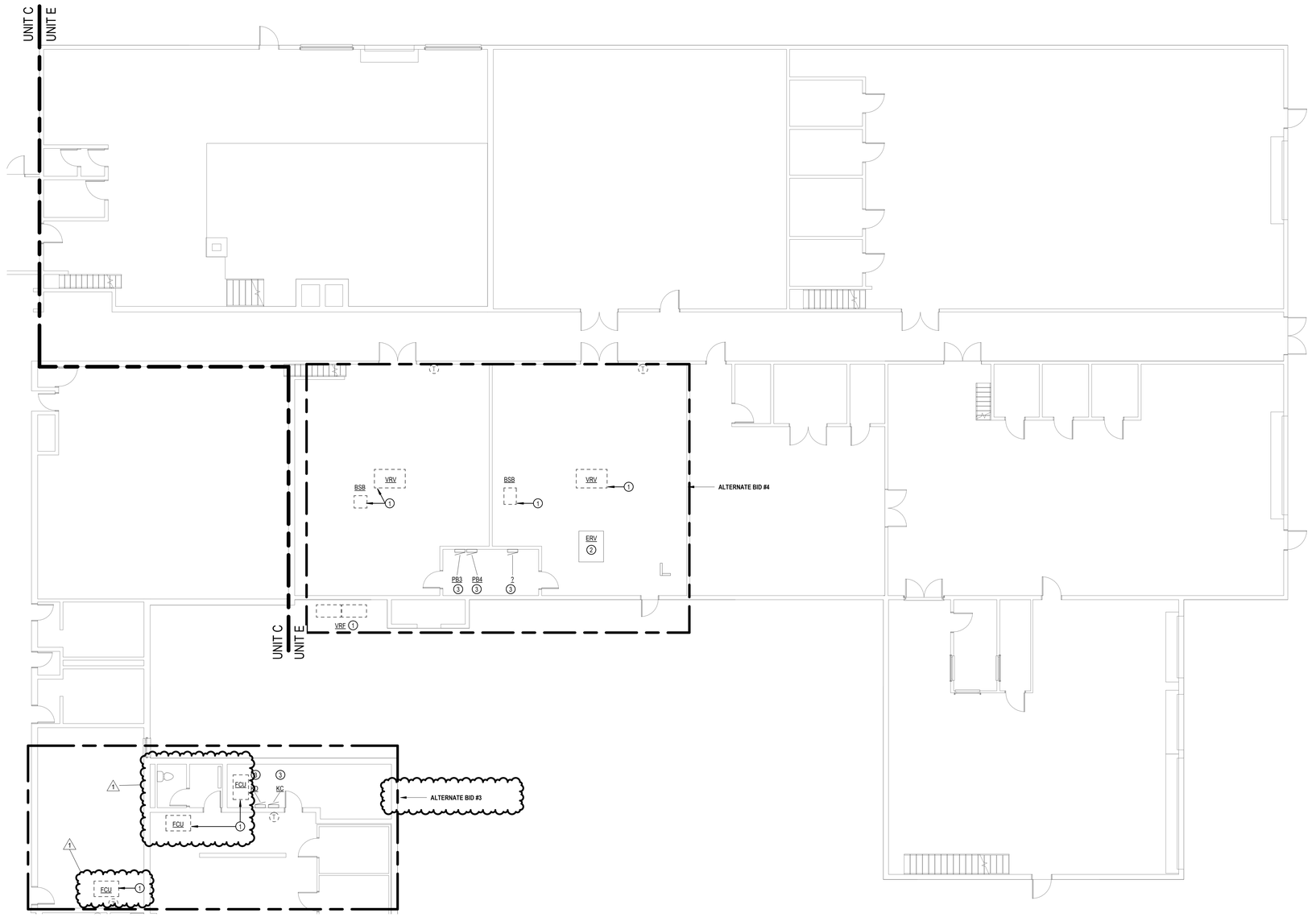
B. COORDINATE ALL DEMOLITION WORK WITH THE OWNER AND THE OTHER TRADES ON THE PROJECT.

C. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR PROPERLY DISPOSING OF ALL REMOVED ELECTRICAL MANTERIALS AND EQUIPMENT IN ACCORDANCE WITH ALL APPLICABLE CODES AND ORDINANCES.

D. PROTECT ALL EXISTING FINISHES, EQUIPMENT, AND DEVICES DURING DEMOLITION WORK THAT ARE TO REMAIN.

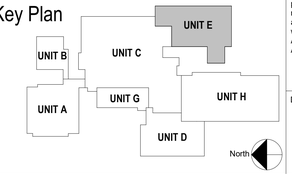
PLAN NOTES

1 DISCONNECT UNIT AND REMOVE ASSOCIATED DEVICES. TERMINATE CIRCUIT BACK TO NEAREST ACCESSIBLE JUNCTION BOX. CIRCUIT TO REMAIN FOR REUSE.
2 EXISTING UNIT TO REMAIN.
3 EXISTING PANEL.



1 ELECTRICAL FIRST FLOOR DEMOLITION - UNIT E
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

Certified By:
DAVID SHUPE
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: bia
Checked By: DSS
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: ELECTRICAL FIRST FLOOR DEMOLITION PLAN - UNIT E
Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
E103

GENERAL NOTES

A. REFER TO DRAWING E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.

B. COORDINATE ALL WORK WITH THE OWNER AND THE OTHER TRADES ON THE PROJECT.

C. REFER TO M AND P SERIES DRAWINGS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.

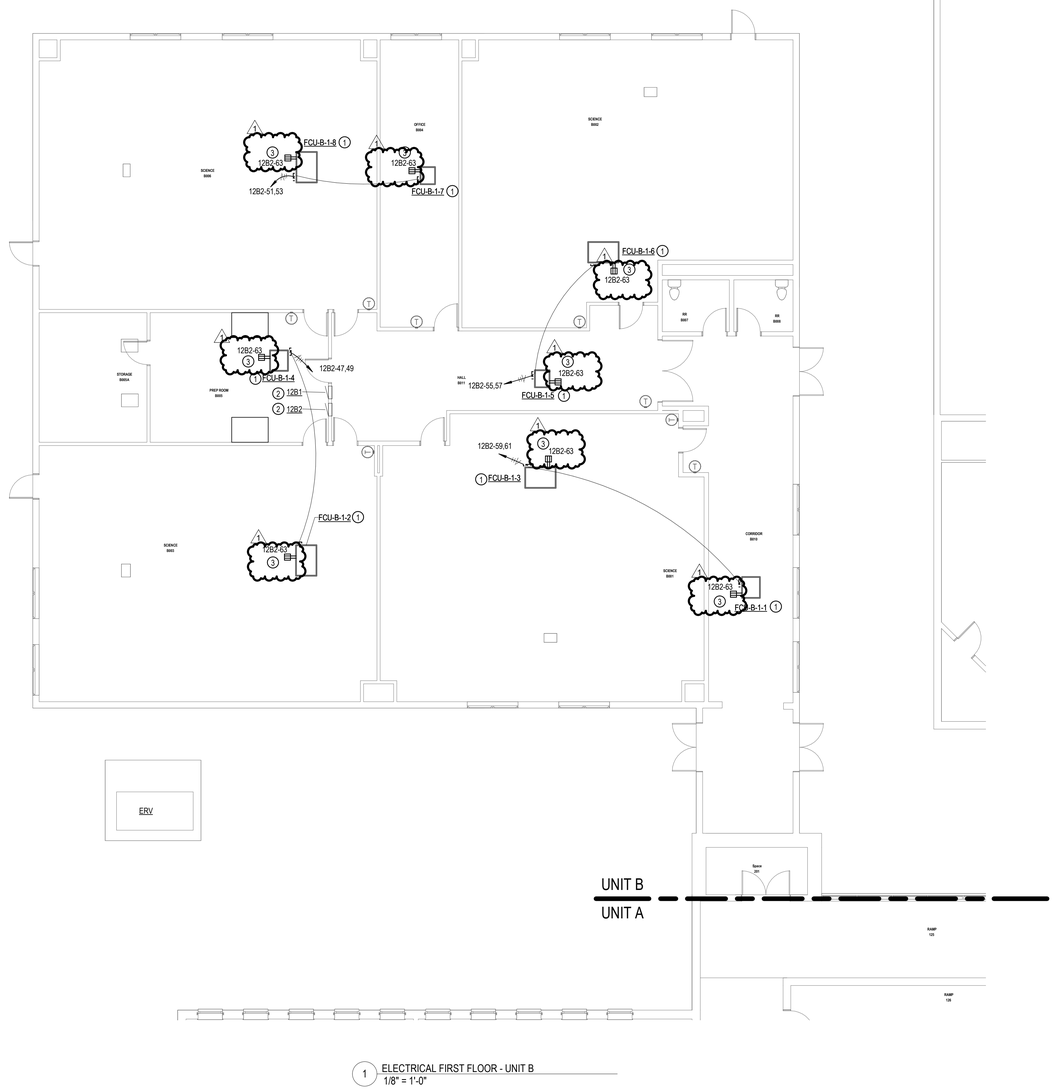
D. PROTECT ALL FINISHES, EQUIPMENT, AND DEVICES DURING THE WORK.

E. CONTRACTOR SHALL VERIFY CORD AND PLUG CONNECTED EQUIPMENT CORD CONFIGURATION AND PROVIDE MATCHING RECEPTACLE AS REQUIRED.

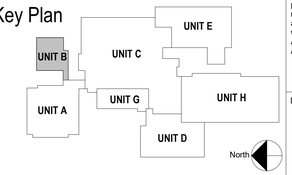
PLAN NOTES

1 DISCONNECT SWITCH PROVIDED BY DIVISION 23.
EXISTING PANEL.

3 PROVIDE AN ABOVE CEILING RECEPTACLE, ADJACENT NEW FCU, FOR CONDENSATE PUMP. COORDINATE INSTALLATION WITH DIVISION 23.



1 ELECTRICAL FIRST FLOOR - UNIT B
1/8" = 1'-0"



ATP ENGINEERING

Certified By:
DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: bia
Checked By: DGS
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION * WINCHESTER INDIANA *

Title: ELECTRICAL FIRST FLOOR POWER AND SYSTEMS PLAN - UNIT B

Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number: E201

GENERAL NOTES

A. REFER TO DRAWING E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.

B. COORDINATE ALL WORK WITH THE OWNER AND THE OTHER TRADES ON THE PROJECT.

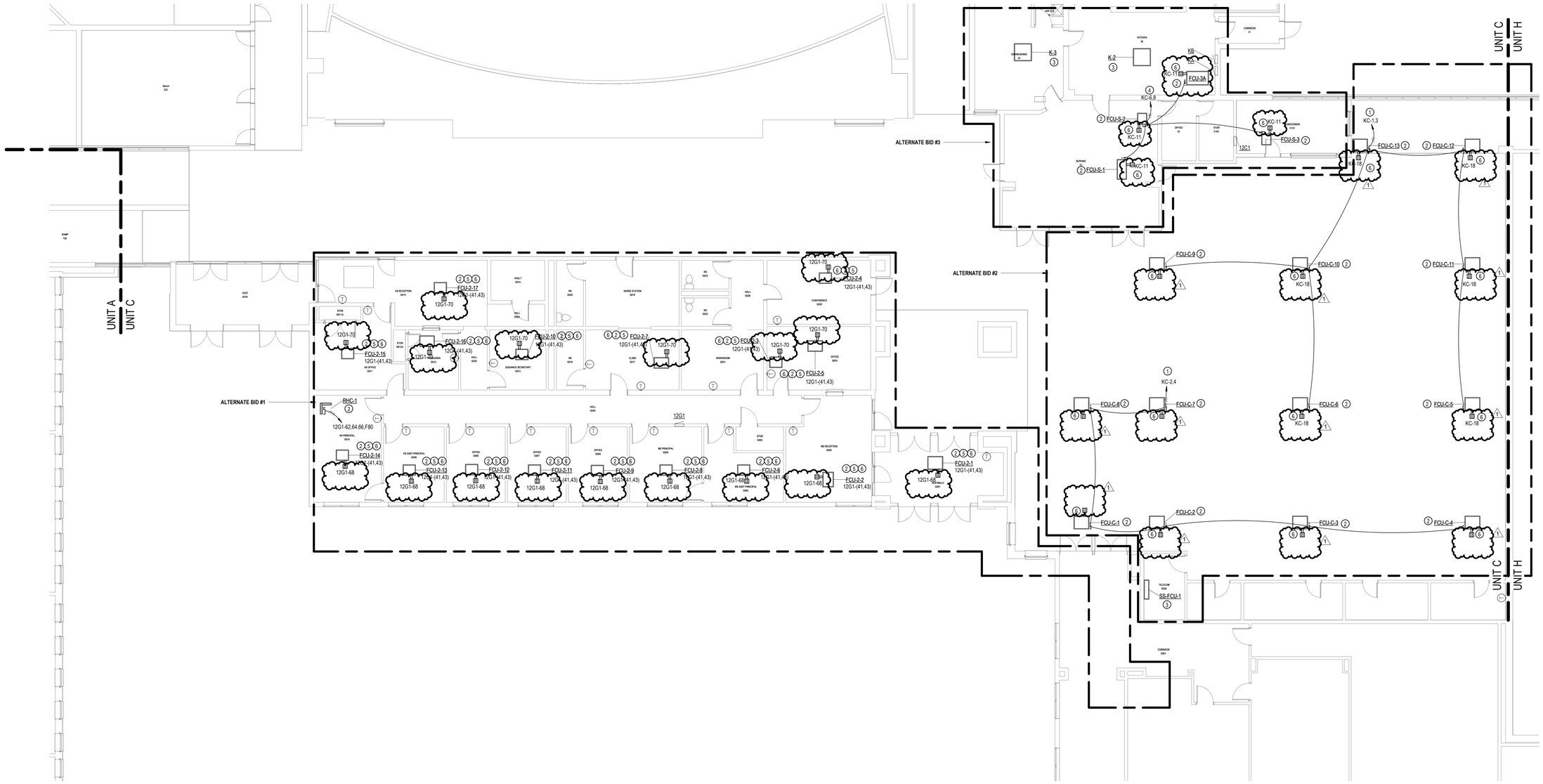
C. REFER TO M AND P SERIES DRAWINGS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.

D. PROTECT ALL FINISHES, EQUIPMENT, AND DEVICES DURING THE WORK.

E. CONTRACTOR SHALL VERIFY CORD AND PLUG CONNECTED EQUIPMENT CORD CONFIGURATION AND PROVIDE MATCHING RECEPTACLE AS REQUIRED.

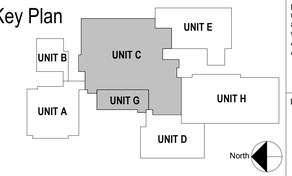
PLAN NOTES

1 REUSE EXISTING CIRCUIT BREAKER MADE SPARE DURING DEMOLITION. RELABEL PANEL SCHEDULE.
2 DISCONNECT SWITCH PROVIDED BY DIVISION 23.
3 DEVICE POWERED FROM EXTERIOR UNIT. COORDINATE INSTALLATION WITH DIVISION 23.
4 PROVIDE 15A-2P CIRCUIT BREAKER. LABEL PANEL SCHEDULE.
5 PROVIDE CONDUIT TO EXISTING CIRCUIT BEARING ICE.
6 PROVIDE AN ABOVE CEILING RECEPTACLE, ADJACENT NEW FCU, FOR CONDENSATE PUMP. COORDINATE INSTALLATION WITH DIVISION 23.



1 ELECTRICAL FIRST FLOOR - UNIT C AND G
1/8" = 1'-0"

Key Plan



ATP ENGINEERING

DAVID SHUPE REGISTERED No. 19700101 STATE OF INDIANA PROFESSIONAL ENGINEER
Certified By:

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: bia
Checked By: DGS
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: ELECTRICAL FIRST FLOOR POWER AND SYSTEMS PLAN - UNIT C AND G

Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
E202

GENERAL NOTES

A. REFER TO DRAWING E001 FOR ELECTRICAL SYMBOLS AND ADDITIONAL GENERAL NOTES.

B. COORDINATE ALL WORK WITH THE OWNER AND THE OTHER TRADES ON THE PROJECT.

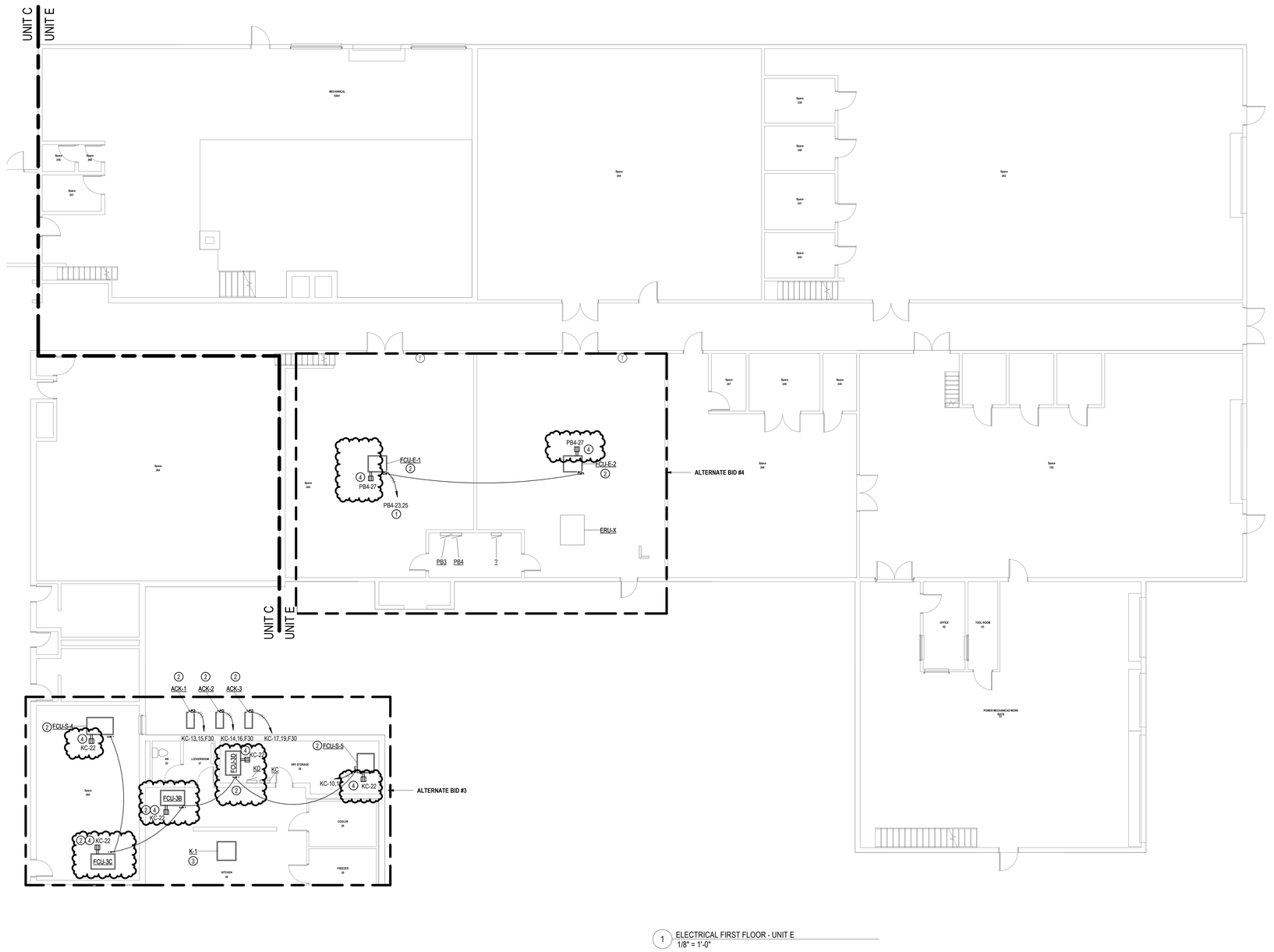
C. REFER TO M AND P SERIES DRAWINGS FOR ADDITIONAL ELECTRICAL REQUIREMENTS.

D. PROTECT ALL FINISHES, EQUIPMENT, AND DEVICES DURING THE WORK.

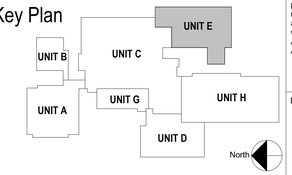
E. CONTRACTOR SHALL VERIFY CORD AND PLUG CONNECTED EQUIPMENT CORD CONFIGURATION AND PROVIDE MATCHING RECEPTACLE AS REQUIRED.

PLAN NOTES

1 PROVIDE 15A-2P CIRCUIT BREAKER. LABEL PANEL SCHEDULE.
2 DISCONNECT SWITCH PROVIDED BY DIVISION 23.
3 DEVICE POWERED FROM EXTERIOR UNIT. COORDINATE INSTALLATION WITH DIVISION 23.
PROVIDE AN ABOVE CEILING RECEPTACLE, ADJACENT NEW FCU, FOR CONDENSATE PUMP. COORDINATE INSTALLATION WITH DIVISION 23.



1 ELECTRICAL FIRST FLOOR - UNIT E
1/8" = 1'-0"



ATP ENGINEERING

Certified By:
DAVID SHUCK
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description
1	12/3/25	Addendum 1

Drawn By: bia
Checked By: DSS
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: ELECTRICAL FIRST FLOOR POWER AND SYSTEMS PLAN - UNIT E

Project: HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
E203

Branch Panel: KC

Location: DRY STORAGE 28
Supplied From:
Mounting: Surface
Enclosure Type: Type 1

Voltage: 120/208 Wye
Phase: 3
Wire: 4
Ground: Y

Branch:
A.I.C. Rating: 22K
Main Type: MLO
Main Rating: 100A

General Panel Comments:
EXISTING GE 'A' SERIES II PANEL
NOTE 1 = REUSE EXISTING CIRCUIT BREAKER
NOTE 2 = PROVIDE NEW CIRCUIT BREAKER TO MATCH PANEL

Circuit Number	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	Circuit Number
1	**Cafeteria - FCU Cassettes (NOTE 1)**	**20 A**	**2**	**1.1** **1**			**2**	**20 A**	**Cafeteria - FCU Cassettes (NOTE 1)**	2
3					1.1 1					4
5	ERU-1 HEAT WHEEL	20 A	3			0 0.9	2	15 A	**Kitchen - FCU Cassettes (NOTE 2)**	6
7				1.2 0.9						8
9					1.2 0.9		2	15 A	**Cafeteria & Dry Storage - FCU Cassettes (NOTE 2)**	10
11	**RECEPT - COND PUMPS**	20 A	1			0.4 0.9				12
13	**Condensing Unit -ACK-1 (NOTE 2)**	30 A	2	2.3 2.3			2	30 A	**Condensing Unit - ACK-2 (NOTE 2)**	14
15					2.3 2.3					16
17	**Condensing Unit - ACK-3 (NOTE 2)**	30 A	2			2.3 0.7	1	20 A	**RECEPT - ABOVE CEILING COND PUMPS (NOTE 2)**	18
19				2.3 0.6			1	20 A	**RECEPT - ABOVE CEILING COND PUMPS (NOTE 2)**	20
21	PROVISION	--	1		-- 0.5		1	20 A	**RECEPT - ABOVE CEILING COND PUMPS (NOTE 2)**	22
23	PROVISION	--	1			-- --	1	--	PROVISION	24
25	PROVISION	--	1	-- --			1	--	PROVISION	26
27	PROVISION	--	1		-- --		1	--	PROVISION	28
29	PROVISION	--	1			-- --	1	--	PROVISION	30
	Total Load:			11.7 kVA	9.3 kVA	5.2 kVA				

Load Sumamry:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	21550 VA	100.00%	21550 VA		
Mechanical	2200 VA	70.00%	1540 VA	**Total Conn. Load:**	26150 VA
Spare	2400 VA	100.00%	2400 VA	**Total Est. Demand:**	25490 VA
				Total Conn. Current:	73 A
				Total Est. Demand Current:	71 A

Remarks:

Branch Panel: PB4

Location:
Supplied From:
Mounting: Surface
Enclosure Type: Type 1

Voltage: 120/208 Wye
Phase: 3
Wire: 4
Ground: YES

Branch:
A.I.C. Rating: 10K
Main Type: 200A MCB
Main Rating:

General Panel Comments:
EXISTING PANEL
NOTE 1 = PROVIDE NEW CIRCUIT BREAKER TO MATCH PANEL

Circuit Number	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	Circuit Number
1				0 0						2
3	KILN #1	40 A	3		0 0		3	40 A	KILN #2	4
5						0 0				6
7	KILN EXHAUST	15 A	1	0 0			2	15 A	UNKNOWN	8
9	UNKNOWN	20 A	1		0 0					10
11	RECEPT - East Wall M.S. Art	20 A	1			0 0	1	20 A	AG Shop Dishwasher	12
13	UNKNOWN	50 A	3	0 0			1	20 A	AG Shop Microwave	14
15					0 0		1	20 A	AG Shop Refrigerator	16
17						0 0				18
19	UNKNOWN	20 A	2	0 0			3	20 A	SPARE	20
21					0 0					22
23	**FCU-E1 & E2 - CLASSROOM E001, E002 (NOTE 1)**	15 A	2			0.7 0	2	50 A	AG Shop Range	24
25				0.7 0						26
27	**RECEPT - ABOVE CEILING COND PUMPS (NO...**	20 A	1		0.2 0		1	20 A	RECEPT - AG Shop Kitchen West	28
29										30
31										32
33										34
35										36
37										38
39										40
41										42
	Total Load:			0.7 kVA	0.2 kVA	0.7 kVA				

Load Sumamry:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	1400 VA	100.00%	1400 VA		
Mechanical	200 VA	70.00%	140 VA	**Total Conn. Load:**	1600 VA
				Total Est. Demand:	1540 VA
				Total Conn. Current:	4 A
				Total Est. Demand Current:	4 A

Remarks:

Branch Panel: 12B2

Location: PREP ROOM B005
Supplied From:
Mounting: Recessed
Enclosure Type: Type 1

Voltage: 120/208 Wye
Phase: 3
Wire: 4
Ground: Y

Branch:
A.I.C. Rating: 10,000
Main Type: MLO
Main Rating: 400A MLO

General Panel Comments:
EXISTING PANEL
NOTE 1 = REUSE EXISTING CIRCUIT BREAKER
NOTE 2 = PROVIDE NEW CIRCUIT BREAKER TO MATCH PANEL

Circuit Number	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	Circuit Number
1	RG OFFICE B004	20 A	1	0 0			1	20 A	RG OFFICE B004	2
3	RG OFFICE B004	20 A	1		0 0		1	20 A	RG SCIENCE B002	4
5	RG SCIENCE B002	20 A	1			0 0	1	20 A	RG SCIENCE B002	6
7	RG SCIENCE B002	20 A	1	0 0			1	20 A	RG SCIENCE B002	8
9	RG SCIENCE B002	20 A	1		0 0		1	20 A	RG SCIENCE B002	10
11	RG SCIENCE B002	20 A	1			0 0	1	20 A	RG SCIENCE B002	12
13	RG SCIENCE B002	20 A	1	0 0			1	20 A	RG SCIENCE B002	14
15	RG SCIENCE B001	20 A	1		0 0		1	20 A	RG SCIENCE B001	16
17	RG SCIENCE B001	20 A	1			0 0	1	20 A	RG SCIENCE B001	18
19	RG SCIENCE B001	20 A	1	0 0			1	20 A	RG SCIENCE B001	20
21	RG SCIENCE B001	20 A	1		0 0		1	20 A	RG SCIENCE B001	22
23	RG SCIENCE B001	20 A	1			0 0	1	20 A	RG SCIENCE B001	24
25	RG SCIENCE B001	20 A	1	0 0			1	20 A	RG SCIENCE B001	26
27	RG ROOM B010, B011	20 A	1		0 0		1	20 A	LI ROOM B011, B004	28
29	RG ROOM B007, B008	20 A	1			0 0	1	20 A	LI SCIENCE B001	30
31	LI SCIENCE B002	20 A	1	0 0			1	20 A	RG ROOM B009, B010	32
33	LI ROOM B009, B007, B008, B010	20 A	1		0 0		1	20 A	RG	34
35	MM SCIENCE B003	20 A	1			0 0	1	20 A	RG ROOM B002, B001 PROJ	36
37	MM SCIENCE B006	20 A	1	0 0			1	20 A	LE	38
39	MM SCIENCE B001	20 A	1		0 0		2	20 A	CUH-1	40
41	MM SCIENCE B003	20 A	1			0 0				42
43	MM SCIENCE B006	20 A	1	0 0			2	20 A	CUH-2	44
45	MM SCIENCE B002	20 A	1		0 0					46
47	**SCIENCE RM B003, PREP B005 FCU-1-4, FCU-1-2 (NOTE 1)**	20 A	2			0.6 0	1	20 A	RTU-4 HR	48
49				0.6 0			1	20 A	SPARE	50
51	**SCIENCE RM B004, B006 FCU-1-7, FCU-1-8 (NOTE1)**	20 A	2		0.7 0		1	20 A	SPARE	52
53						0.7 0	1	20 A	SPARE	54
55	**SCIENCE RM B002, HALL B011 FCU-1-5, FCU-1-6 (NOTE 2)**	20 A	2	0.7 0			1	20 A	SPARE	56
57					0.7 0		1	20 A	SPARE	58
59	**SCIENCE B001, HALL B010 FCU-1-1, FCU-1-3 (NOTE 2)**	20 A	2			0.7 0	1	20 A	SPARE	60
61				0.7 0			1	20 A	SPARE	62
63	**RECEPT - COND PUMP B006, B004, B002, B01...**	20 A	1		0.8 0		1	20 A	SPARE	64
65	SPARE	20 A	1			0 0	1	20 A	SPARE	66
67										68
69										70
71										72
	Total Load:			1.9 kVA	2.1 kVA	1.9 kVA				

Load Sumamry:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	5180 VA	100.00%	5180 VA		
Mechanical	800 VA	70.00%	560 VA	**Total Conn. Load:**	5980 VA
Motor	0 VA	0.00%	0 VA	**Total Est. Demand:**	5740 VA
				Total Conn. Current:	17 A
				Total Est. Demand Current:	16 A

Remarks:

Branch Panel: 12G1

Location: HALL G026
Supplied From:
Mounting: Recessed
Enclosure Type: Type 1

Voltage: 120/208 Wye
Phase: 3
Wire: 4
Ground: Y

Branch:
A.I.C. Rating: 10,000
Main Type: MLO
Main Rating: 225A

General Panel Comments:
EXISTING PANEL
NOTE 1 = PROVIDE NEW CIRCUIT BREAKER TO MATCH PANEL

Circuit Number	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	Circuit Number
1	RG Room 188, G015, G029	20 A	1	0 0			1	20 A	RG HS Reception G015	2
3	R HS Reception G015	20 A	1		0 0		1	20 A	RG AD Office G011	4
5	RG Treasurer G012	20 A	1			0 0	1	20 A	RG Guidance Secretary	6
7	RG Room G020, G019	20 A	1	0 0			1	20 A	RG Room G017, G018	8
9	RG Room G017, G018, 188	20 A	1		0 0		1	20 A	RG Nurse Station G018	10
11	RG Clinic G017	20 A	1			0 0	1	20 A	RG Room G028, G023, G022	12
13	RG Workroom G021	20 A	1	0 0			1	20 A	RG Workroom G021	14
15	RG Workroom G021	20 A	1		0 0		1	20 A	RG Workroom G021	16
17	RG Workroom G021	20 A	1			0 0	1	20 A	RG Office G024	18
19	RG Conference G025	20 A	1	0 0			1	20 A	RG Room 188, G001	20
21	RG MS Reception G002	20 A	1		0 0		1	20 A	RG MS Reception G002	22
23	R MS Reception G002	20 A	1			0 0	1	20 A	RG MS Asst Principal G004	24
25	RG MS Principal G005	20 A	1	0 0			1	20 A	RG Office G006	26
27	RG Office G007	20 A	1		0 0		1	20 A	RG Office G008	28
29	RG HS Asst Principal G009	20 A	1			0 0	1	20 A	RS HS Principal G010	30
31	RG Hall G026	20 A	1	0 0			1	20 A	LI Room G015, G011, G029	32
33	LI Room G030, G026, G027	20 A	1		0 0		1	20 A	LI Room G022, G023, G020	34
35	LI Room G002, G024, G025	20 A	1			0 0	1	20 A	LI Room G010, G009, G008	36
37	LE	20 A	2	0 0			2	20 A	LE	38
39					0 0					40
41	**Fan Coil Units**	20 A	2			0 0	2	20 A	MH Vestibule G001 CUH-4	42
43				0 0						44
45	MH Vestibule G001 CUH-5	20 A	2		0 0		2	20 A	MM Space 188	46
47						0 0				48
49	RG Workroom G021	20 A	1	0 0			2	20 A	LE	50
51	LI Space 188	20 A	1		0 0					52
53	LI Space 188	20 A	1			0 0	1	20 A	LI Space 188	54
55	LE	20 A	1	0 0			1	20 A	LI Space 187	56
57	LI Space 187	20 A	1		0 0		1	20 A	LI Space 187	58
59	LI Space 187	20 A	1			0 0	1	20 A	RG	60
61	RG	20 A	1	0 6.7						62
63	**SPARE**	50 A	3		0 6.7		3	80 A	**ELEC DUCT COIL - HS PRINCIPAL G010 (NOTE 1)**	64
65						0 6.7				66
67				0 0.9			1	20 A	**RECEPT - COND PUMPS ABOVE CEILING (NOTE 1)**	68
69					0.8		1	20 A	**RECEPT - COND PUMPS ABOVE CEILING (NOTE 1)**	70
71										72
73										74
75										76
77										78
79	PROVISION	--	1	-- --			1	--	PROVISION	80
81	PROVISION	--	1		-- --		1	--	PROVISION	82
83	PROVISION	--	1			-- --	1	--	PROVISION	84
	Total Load:			7.6 kVA	7.5 kVA	6.7 kVA				

Load Sumamry:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals	
HVAC	20000 VA	100.00%	20000 VA		
Mechanical	1700 VA	70.00%	1190 VA	**Total Conn. Load:**	21700 VA
				Total Est. Demand:	21190 VA
				Total Conn. Current:	60 A
				Total Est. Demand Current:	59 A

Remarks:

ATP ENGINEERING

Certified By:
DAVID SHUPE
REGISTERED
No. 19700101
STATE OF INDIANA
PROFESSIONAL ENGINEER

Revisions

Number	Date	Description

Drawn By: bia
Checked By: DSS
Project Status: 100% CONSTRUCTION DOCUMENTS
Date: 11.14.2025

RANDOLPH CENTRAL SCHOOL CORPORATION
WINCHESTER INDIANA

Title: **ELECTRICAL SCHEDULES**
Project: **HIGH SCHOOL HVAC EQUIPMENT REPLACEMENT**
RANDOLPH CENTRAL SCHOOL CORPORATION
700 UNION STREET, WINCHESTER, IN 47394
ATP PROJECT: 25010

Drawing Number:
E601

SECTION 220700 - MECHANICAL INSULATION

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM C195 - Standard Specification for Mineral Fiber Thermal Insulating Cement; 2007 (Reapproved 2024).

B. ASTM C450 - Standard Practice for Fabrication of Thermal Insulating Fitting Covers for NPS Piping, and Vessel Lagging; 2018.

C. ASTM C533 - Standard Specification for Calcium Silicate Block and Pipe Thermal Insulation; 2017 (Reapproved 2023).

D. ASTM C547 - Standard Specification for Mineral Fiber Pipe Insulation; 2022a.

E. ASTM C553 - Standard Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications; 2024.

F. ASTM C585 - Standard Practice for Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing; 2022.

G. ASTM C612 - Standard Specification for Mineral Fiber Block and Board Thermal Insulation; 2014 (Reapproved 2019).

H. ASTM C795 - Standard Specification for Thermal Insulation for Use in Contact with Austenitic Stainless Steel; 2008 (Reapproved 2023).

I. ASTM C1136 - Standard Specification for Flexible, Low Permeance Vapor Retarders for Thermal Insulation; 2023.

J. ASTM C1290 - Standard Specification for Flexible Fibrous Glass Blanket Insulation Used to Externally Insulate HVAC Ducts; 2016 (Reapproved 2021).

K. ASTM D1784 - Standard Classification System and Basis for Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 2025.

L. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023d.

M. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.

N. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 Degrees C; 2024c.

O. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2023a.

P. ASTM F1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor; 2025.

Q. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

R. UL 1978 - Grease Ducts; Current Edition, Including All Revisions.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.03 SUMMARY

A. This Section includes mechanical insulation for boiler breeching, duct, equipment, and pipe, including the following:
   1. Insulation Materials:
      a. Fiberglass.
   2. Fire-rated insulation systems.
   3. Adhesives.

4. Mastics.
5. Sealants.
6. Factory-applied jackets.
7. Field-applied jackets.
8. Tapes.
9. Securements.
10. Valve fitting wraps

B. This Section applies to work specified as part of Division 21, 22 and 23.

C. Related Sections include the following:
1. Division 23 Section "Metal Ducts" for duct liners (only when specified for use).

1.04 DEFINITIONS

A. ASJ: All-service jacket.

B. FSK: Foil, scrim, kraft paper.

C. PSK: Metalized Polypropylene scrim kraft.

D. FSP: Foil, scrim, polyethylene.

E. SSL: Self-sealing lap.

1.05 SUBMITTALS

A. Product Data: For each type of product indicated, identify thermal conductivity, thickness, and jackets (both factory and field applied, if any). Include data for adhesives, mastics, securements, etc.

B. Schedule: Submit schedule indicating insulation type, thicknesses, and jacket to be used for each item to be insulated.

1.06 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
1. Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

B. Storage: Store insulation in a safe, dry, clean environment. Insulation containing moisture, and/or not stored properly will not be accepted.

1.08 COORDINATION

A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 22 Section "Mechanical Hangers and Supports."

B. Coordinate clearance requirements with piping Installer for piping insulation application, duct Installer for duct insulation application, and equipment Installer for equipment insulation application. Before preparing piping and ductwork Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

1.09 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 INSULATION MATERIALS

A. Refer to Part 3 schedule articles for requirements about where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Fiberglass Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C553, Type II and ASTM C1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in Part 2 "Factory-Applied Jackets" Article.
   1. Manufacturers:
      a. CertainTeed Corp.; Duct Wrap.
      b. Johns Manville; Microlite.
      c. Knauf Insulation; Duct Wrap.
      d. Manson Insulation Inc.; Alley Wrap.
      e. Owens Corning; All-Service Duct Wrap.
   2. K factor: .28 at 75 deg. F.

G. Fiberglass Board Insulation: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C612, Type IA or Type IB. For duct and plenum applications, provide insulation with factory-applied ASJ or with factory-applied FSK jacket. For equipment applications, provide insulation with factory-applied ASJ or with factory-applied FSK jacket. See insulation schedules for application. Factory-applied jacket requirements are specified in Part 2 "Factory-Applied Jackets" Article.
   1. Manufacturers:
      a. CertainTeed Corp.; Commercial Board.
      b. Johns Manville; 800 Series Spin-Glas.
      c. Knauf Insulation; Insulation Board.
      d. Manson Insulation Inc.; AK Board.
      e. Owens Corning; Fiberglas 700 Series.
   2. K factor: .23 at 75 deg. F.

H. Fiberglass, Preformed Pipe Insulation:
   1. Manufacturers:
      a. Johns Manville; Micro-Lok.
      b. Knauf Insulation; 1000(Pipe Insulation.
      c. Manson Insulation Inc.; Alley-K.
      d. Owens Corning; Fiberglas Pipe Insulation.
   2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in Part 2 "Factory-Applied Jackets" Article.
   3. K factor: .25@ 100 deg. F.

4. Density: Minimum 3.5 lb/cubic ft.

2.03 FIRE-RATED INSULATION SYSTEMS

A. Plenum-Rated Blanket: 2000 deg. F to 2300 deg. F rated, flexible blanket insulation with FSK jacket, UL listed as complying with UL 910. Product shall be specifically tested for plastic pipe and cable protection from external flame-propagation and smoke generation in return air plenums. Shall be a body soluble, low biopersistence, alkaline-earth silicate wool.
   1. Manufacturers
      a. Thermal Ceramics; FireMaster Plenum Wrap.
      b. 3M; Plenum Wrap Products.

2.04 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.

B. Flexible Elastomeric Adhesive: Comply with MIL-A-24179A, Type II, Class I.
   1. Manufacturers:
      a. Aeroflex USA Inc.; Aeroseal.
      b. Armacell LCC; 520 Adhesive.
      c. Foster Products Corporation, H. B. Fuller Company; 85-75.
      d. RBX Corporation; Rubatex Contact Adhesive.

C. Fiberglass Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
   1. Manufacturers:
      a. Childers Products, Division of ITW; CP-82.
      b. Foster Products Corporation, H. B. Fuller Company; 85-20.
      c. ITW TACC, Division of Illinois Tool Works; S-90/80.
      d. Marathon Industries, Inc.; 225.
      e. Mon-Eco Industries, Inc.; 22-25.

D. ASJ Adhesive, and FSK Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.
   1. Manufacturers:
      a. Childers Products, Division of ITW; CP-82.
      b. Foster Products Corporation, H. B. Fuller Company; 85-20.
      c. ITW TACC, Division of Illinois Tool Works; S-90/80.
      d. Marathon Industries, Inc.; 225.
      e. Mon-Eco Industries, Inc.; 22-25.

E. PVC Jacket Adhesive: Compatible with PVC jacket.
   1. Manufacturers:
      a. Dow Chemical Company (The); 739, Dow Silicone.
      b. Johns-Manville; Zeston Perma-Weld, CEEL-TITE Solvent Welding Adhesive.
      c. P.I.C. Plastics, Inc.; Welding Adhesive.
      d. Red Devil, Inc.; Celulon Ultra Clear.
      e. Speedline Corporation; Speedline Vinyl Adhesive.

2.05 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

B. Vapor-Retarder Mastic: Water based; suitable for indoor and outdoor use on below ambient services.
   1. Manufacturers:
      a. Childers Products, Division of ITW; CP-35.
      b. Foster Products Corporation, H. B. Fuller Company; 30-90.

c. ITW TACC, Division of Illinois Tool Works; CB-50.
d. Marathon Industries, Inc.; 590.
e. Mon-Eco Industries, Inc.; 55-40.
f. Vimasco Corporation; 749.

2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
3. Service Temperature Range: Minus 20 to plus 180 deg F.
4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
5. Color: Match insulation color.

2.06 SEALANTS

A. Sealants:
1. Materials shall be compatible with insulation materials, jackets, and substrates. Color shall match insulation or jacket color. Service shall match insulation application, vapor permeance, and installation environmnet.

B. FSK and Metal Jacket Flashing Sealants:
1. Manufacturers:
a. Childers Products, Division of ITW; CP-76-8.
b. Foster Products Corporation, H. B. Fuller Company; 95-44.
c. Marathon Industries, Inc.; 405.
d. Mon-Eco Industries, Inc.; 44-05.
e. Vimasco Corporation; 750.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: Aluminum.

C. ASJ Flashing Sealants, and PVC Jacket Flashing Sealants:
1. Manufacturers:
a. Childers Products, Division of ITW; CP-76.
2. Materials shall be compatible with insulation materials, jackets, and substrates.
3. Fire- and water-resistant, flexible, elastomeric sealant.
4. Service Temperature Range: Minus 40 to plus 250 deg F.
5. Color: White.

2.07 FACTORY-APPLIED JACKETS

A. Provide factory applied jacket for all insulation types, except for flexible elastomeric. Comply with the following:
1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C1136, Type I. Suitable for painting.
2. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C1136, Type II.
3. PSK Jacket: Metalized white polypropylene, fiberglass-reinforced kraft paper backing; complying with ASTM C1136, Type II.

2.08 FIELD-APPLIED JACKETS

A. Field-applied jackets shall comply with ASTM C 921, Type I, unless otherwise indicated.

B. PVC Jacket: High-impact-resistant, UV-resistant PVC complying with ASTM D1784, Class 16354-C; 30 mil thickness; roll stock ready for shop or field cutting and forming.
1. Manufacturers:
a. Johns Manville; Zeston.
b. P.I.C. Plastics, Inc.; FG Series.

c. Proto PVC Corporation; LoSmoke.
d. Speedline Corporation; SmokeSafe.

2. Adhesive: As recommended by jacket material manufacturer.
3. Color: White.
4. Factory-fabricated fitting covers to match jacket if available; otherwise, field fabricate.
   a. Shapes: 45- and 90-degree, short- and long-radius elbows, tees, valves, flanges, unions, reducers, end caps, soil-pipe hubs, traps, mechanical joints, and P-trap and supply covers for lavatories.
5. Factory-fabricated tank heads and tank side panels.
6. Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

C. **Metal Jacket:**
   1. **Manufacturers:**
      a. **Childers Products, Division of ITW; Metal Jacketing Systems.**
      b. **PABCO Metals Corporation; Surefit.**
      c. **RPR Products, Inc.; Insul-Mate.**
   2. **Aluminum Jacket: Comply with ASTM B 209, Alloy 3003, 3005, 3105 or 5005, Temper H-14.**
      a. **Thickness: .032 inches.**
      b. **Factory-Fabricated Fitting Covers:**
         1) **Same material, finish, and thickness as jacket.**
         2) **Preformed 2-piece or gore, 45- and 90-degree, short- and long-radius elbows.**
         3) **Tee covers.**
         4) **Flange and union covers.**
         5) **End caps.**
         6) **Beveled collars.**
         7) **Valve covers.**
         8) **Field fabricate fitting covers only if factory-fabricated fitting covers are not available.**

2.09 TAPES

A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C1136 and UL listed.
   1. Width: 3 inches.
   2. Thickness: 11.5 mils.
   3. Adhesion: 90 ounces force/inch in width.
   4. Elongation: 2 percent.
   5. Tensile Strength: 40 lbf/inch in width.
   6. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

B. FSK and PSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C1136 and UL listed.
   1. Width: 3 inches.
   2. Thickness: 6.5 mils.
   3. Adhesion: 90 ounces force/inch in width.
   4. Elongation: 2 percent.
   5. Tensile Strength: 40 lbf/inch in width.
   6. FSK Tape Disks and Squares: Precut disks or squares of FSK tape.

C. PVC Tape: White vapor-retarder tape matching field-applied PVC jacket with acrylic adhesive. Suitable for indoor and outdoor applications.
   1. Width: 2 inches.
   2. Thickness: 6 mils.
   3. Adhesion: 64 ounces force/inch in width.

4. Elongation: 500 percent.
5. Tensile Strength: 18 lbf/inch in width.

D. Aluminum-Foil Tape: Vapor-retarder tape with acrylic adhesive and UL listed.
1. Width: 2 inches.
2. Thickness: 3.7 mils.
3. Adhesion: 100 ounces force/inch in width.
4. Elongation: 5 percent.
5. Tensile Strength: 34 lbf/inch in width.

2.10 SECUREMENTS

A. Insulation Pins and Hangers:
1. Install pins, hangers, and securements according to manufacturer's installation recommendation.

2.11 VALVE AND SPECIALTY FITTING WRAPS

A. All valves, strainers, autoflow valves, circuit setters, ball valves, balancing valves, and combination valves, etc., in cold water systems that operate below ambient temperature, shall be insulated with a factory fabricated removable and reusable cover.
1. Insulation shall have a minimum k- factor .26, using fiberglass blanket. Flame and smoke spread shall be 25/50 per ASTM E-84.
2. Outer jacket shall be made of material equal to DuPont Tychem® QC, overlapping and completely covering the insulation with seams joined by tabs made from hook and loop fasteners (Velcro). Butt ends shall have sewn-in-place elastic.
3. Outer jacket shall overlap adjoining sections of pipe insulation.
4. Installation shall not require the use of any special hand tools.
5. Manufacturers: No Sweat Valve Wraps, Inc., or approved equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.
1. Verify that systems and equipment to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.
3. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application. Before insulating chilled water piping, apply a corrosion coating to insulated surfaces as follows:
1. Steel Pipe: Coat with an epoxy coating. Consult coating manufacturer for appropriate coating materials and application methods for operating temperature range.

3.03 COMMON INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
   1. Install insulation continuously through hangers and around anchor attachments.
   2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
   3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
   4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:
   1. Draw jacket tight and smooth.
   2. Cover circumferential joints with 3-inch- wide strips, of same material as insulation jacket. Secure strips with adhesive along both edges of strip. Do not staple, use extra adhesive as required.
   3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Do not staple laps, provide extra adhesive as required.
      a. For below ambient services, apply vapor-barrier mastic where required to maintain vapor seal.
   4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
   5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above ambient services, do not install insulation to the following:
   1. Vibration-control devices.
   2. Testing agency labels and stamps.
   3. Nameplates and data plates.
   4. Manholes.
   5. Handholes.
   6. Cleanouts.

3.04 PENETRATIONS

A. Insulation Installation at Roof Penetrations: Install insulation continuously through roof penetrations.
   1. Seal penetrations with flashing sealant.

2. Extend jacket of outdoor insulation outside roof flashing at least 2 inches below top of roof flashing.
3. Seal jacket to roof flashing with flashing sealant.

B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

C. Insulation Installation at Fire-Rated Wall and Partition Penetrations: Install insulation continuously through penetrations of fire-rated walls and partitions. Terminate insulation at fire damper sleeves for fire-rated wall and partition penetrations where fire dampers are provided. Externally insulate damper sleeves to match adjacent insulation and overlap duct insulation at least 2 inches.

D. Insulation Installation at Floor Penetrations:
1. Duct: Install insulation continuously through floor penetrations that are not fire rated. For penetrations through fire-rated assemblies, terminate insulation at fire damper sleeves and externally insulate damper sleeve beyond floor to match adjacent duct insulation. Overlap damper sleeve and duct insulation at least 2 inches.
2. Pipe: Install insulation continuously through floor penetrations.
3. Seal penetrations through fire-rated assemblies according to Division 7 Section "Through-Penetration Firestop Systems."

3.05 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this Article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above

ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

8. Except for flexible elastomeric, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Provide Valve and Specialty Fittings Wraps on valves, fittings and specialties on services operating below ambient, such as chilled water connections to equipment.

3.06 FIBERGLASS INSULATION INSTALLATION

A. Insulation Installation on Straight Pipes and Tubes:
1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with extra adhesive as necessary. Staples are not allowed.
4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

B. Insulation Installation on Pipe Flanges:
1. Install preformed pipe insulation to outer diameter of pipe flange.
2. Make width of insulation section same as overall width of flange and bolts, plus twice the thickness of pipe insulation.
3. Fill voids between inner circumference of flange insulation and outer circumference of adjacent straight pipe segments with fiberglass blanket insulation.
4. Install jacket material with manufacturer's recommended adhesive, overlap seams at least 1 inch, and seal joints with flashing sealant.

C. Insulation Installation on Pipe Fittings and Elbows:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

D. Insulation Installation on Valves and Pipe Specialties:
1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

E. Blanket Insulation Installation on Ducts and Plenums: Secure with adhesive and mechanical fasteners.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.

3. Install mechanical fasteners on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    a. On duct sides with dimensions 18 inches and smaller, place mechanical fasteners along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, place mechanical fasteners 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional mechanical fasteners to hold insulation tightly against surface at cross bracing.
    c. Mechanical fasteners may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Impale insulation over pins and attach speed washers.
    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch (13-mm) outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.
    a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
    b. Install vapor stops for ductwork and plenums operating below 50 degrees Fahrenheit at 18-foot (5.5-m) intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.
5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

F. Board Insulation Installation on Ducts and Plenums: Secure with adhesive and mechanical fasteners.
1. Apply adhesives according to manufacturer's recommended coverage rates per unit area.
2. Apply adhesive to entire circumference of ducts and to all surfaces of fittings and transitions.
3. Install mechanical fasteners on sides and bottom of horizontal ducts and sides of vertical ducts as follows:
    a. On duct sides with dimensions 18 inches and smaller, place mechanical fasteners along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches o.c.
    b. On duct sides with dimensions larger than 18 inches, space mechanical fasteners 16 inches o.c. each way, and 3 inches maximum from insulation joints. Install additional mechanical fasteners to hold insulation tightly against surface at cross bracing.
    c. Mechanical fasteners may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not overcompress insulation during installation.
    e. Cut excess portion of mechanical fasteners extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.
4. For ducts and plenums with surface temperatures below ambient, install a continuous unbroken vapor barrier. Create a facing lap for longitudinal seams and end joints with insulation by

removing 2 inches from 1 edge and 1 end of insulation segment. Secure laps to adjacent insulation section with 1/2-inch (13-mm) outward-clinching staples, 1 inch o.c. Install vapor barrier consisting of factory- or field-applied jacket, adhesive, vapor-barrier mastic, and sealant at joints, seams, and protrusions.

a. Repair punctures, tears, and penetrations with tape or mastic to maintain vapor-barrier seal.
b. Install vapor stops for ductwork and plenums operating below 50 degrees Fahrenheit at 18-foot (5.5-m) intervals. Vapor stops shall consist of vapor-barrier mastic applied in a Z-shaped pattern over insulation face, along butt end of insulation, and over the surface. Cover insulation face and surface to be insulated a width equal to 2 times the insulation thickness but not less than 3 inches.

5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. Groove and score insulation to fit as closely as possible to outside and inside radius of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches o.c.

3.07 FIELD-APPLIED JACKET INSTALLATION

A. Where PVC jackets are indicated, install with 1-inch overlap at longitudinal seams and end joints; for horizontal applications, install with longitudinal seams along top and bottom of tanks and vessels. Seal with manufacturer's recommended adhesive.
   1. Apply two continuous beads of adhesive to seams and joints, one bead under lap and the finish bead along seam and joint edge.

B. Where metal jackets are indicated, install with 2-inch overlap at longitudinal seams and end joints. Overlap longitudinal seams arranged to shed water. Seal end joints with weatherproof sealant recommended by insulation manufacturer. Secure jacket with stainless-steel bands 12 inches o.c. and at end joints.

3.08 FIRE-RATED INSULATION SYSTEM INSTALLATION

A. Install firestopping at penetrations through fire-rated assemblies. Fire-stop systems are specified in Division 7 Section "Through-Penetration Firestop Systems."

B. Plenum-rated insulation installation – comply with the following:
   1. Cut to a length sufficient to wrap completely around the perimeter of the pipe, plus provide an overlap of not less than 1 inch.
   2. Secure blanket in place by using minimum ¾ inch wide filament tape as a temporary hold until banding or tie wire is in place. The tape shall be spaced ¼ inch from the edge of the blanket and at the midpoint of the blanket.
   3. Cut the next adjacent wrap to completely wrap around the perimeter of the pipe with enough excess to overlap itself not less than 1 inch. A 1 inch longitudinal overlap is required onto the previous adjacent wrap.
   4. Use filament tape as a temporary hold until the mechanical attachment is secured.
   5. Mechanical attachment: Provide minimum ½ inch wide banding, .015 inch thick carbon or stainless steel. Spacing shall be per manufacturers instructions. Tighten the banding to hold the wrap firmly in place without cutting or damaging the wrap.
   6. Comply with manufacturer installation requirements, consistent with product listing.

3.09 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified independent inspecting agency to perform field inspections and prepare inspection reports.

B. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements. Remove defective Work.

C. Install new insulation and jackets to replace insulation and jackets removed for inspection. Repeat inspection procedures after new materials are installed.

3.10 DUCT INSULATION SCHEDULE, GENERAL

A. Plenums and Ducts Requiring Insulation:
1. Indoor, supply air ducts and outdoor air ducts.
2. Indoor exhaust and relief between isolation damper and penetration of building exterior.
3. Ductwork located outdoors: Outdoor air ducts..

B. Items Not Insulated:
1. Fibrous-glass ducts.
2. Metal ducts with duct liner of sufficient thickness to comply with energy code and ASHRAE/IESNA 90.1 - 2007.
3. Factory-insulated flexible ducts.
4. Factory-insulated plenums and casings.
5. Flexible connectors.
6. Vibration-control devices.
7. Factory-insulated access panels and doors.
8. Return Air Ducts.
9. Transfer air ducts.
10. Exhaust ductwork, unless specified otherwise elsewhere.

3.11 INDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Provide continuous vapor-retarder for all installations.

B. Round and flat oval ductwork – Concealed ductwork or ductwork exposed in mechanical rooms; provide the following:
1. Fiberglass Blanket: 1-1/2 inches thick and 1.0-lb/cu. ft. nominal density.
a. Provide two layers of the specified insulation when installed in an unheated attic space.
2. Factory Applied Jacket: FSK

C. Rectangular ductwork – Concealed ductwork or ductwork exposed in mechanical rooms; provide any of the following:
1. Fiberglass Blanket: 1-1/2 inches thick and 1.0-lb/cu. ft. nominal density.
a. Provide two layers of the specified insulation when installed in an unheated attic space.
2. Fiberglass Board: 1-1/2 inches thick and 3-lb/cu. ft. nominal density.
a. Provide two layers of the specified insulation when installed in an unheated attic space.
3. Factory Applied Jacket: FSK

3.12 ABOVEGROUND, OUTDOOR DUCT AND PLENUM INSULATION SCHEDULE

A. Provide continuous vapor-retarder for all installations.

B. Provide a field applied, watertight metal jacket for all installations.

C. Insulation materials and thicknesses are identified below. If more than one material is listed for a duct system, selection from materials listed is Contractor's option.

D. Rectangular; provide the following:
1. Fiberglass Board: 3 inches thick and 3-lb/cu. ft. nominal density.

E. Round and flat oval; provide the following:
1. Fiberglass Pipe and Tank Insulation: 3 inches thick.

3.13 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
   1. Fire-suppression piping.
   2. Drainage piping located in crawl spaces.
   3. Below-grade drainage piping.
   4. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

C. Provide a continuous vapor-retarder for applications where pipe surface temperatures below ambient exist.

3.14 INDOOR PIPING INSULATION SCHEDULE

A. Air Conditioning Condensate and Equipment Drain Water below 60 Deg F:
   1. All Pipe Sizes: Insulation shall be any of the following:
      a. Fiberglass, Preformed Pipe Insulation: 1/2 inch thick.

B. Dual Temperature Hydronic Water Supply and Return:
   1. NPS 2” and Smaller: Insulation shall be the following:
      a. Fiberglass, Preformed Pipe Insulation: 1 inch thick.
   2. NPS 2-1/2” and Larger: Insulation shall be the following:
      a. Fiberglass, Preformed Pipe Insulation: 1-1/2inch thick.

C. Refrigerant Suction and Hot-Gas Piping:
   1. All Pipe Sizes: Insulation shall be the following:
      a. Flexible Elastomeric: 3/4 inch thick.
      b. Field Applied Jacket: Aluminum where located outdoors.

D. Plastic Piping Installed in Air Plenum Space:
   1. For the purpose of this item the following piping materials shall be considered plastic piping requiring the specified insulation:
      a. PVC
      b. CPVC
      c. PP
      d. PB
      e. PE
   2. All Pipe Sizes: Insulation shall be the following:
      a. Plenum-rated blanket: 1/2 inch thick.
      b. Fiberglass Preformed Pipe Insulation where the installation is approved and tested by a third party agency for use to protect exposed surfaces in an air plenum.

END OF SECTION