



CERTIFICATION

PROJECT: USACE HVAC, Elec, and Plumb Reset, (Concord, NC)

The data presented in this report is a record of system measurements and final adjustments that have been obtained in accordance with the current edition of the NEBB *Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems*. Any variances from design quantities, which exceed NEBB tolerances, are noted in the Test-Adjust-Balance Report Project Summary.


The air distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB-Southeast
REGISTRATION NO: 3755
CERTIFIED BY: J. Scott Springer 23312
DATE: 9/25/2023

The hydronic distribution system has been tested and balanced and final adjustments have been made in accordance with NEBB standards and the project specifications.

NEBB TAB FIRM: National TAB-Southeast
REGISTRATION NO: 3086
CERTIFIED BY: J. Scott Springer 23312
DATE:

Submitted and Certified by:

NEBB TAB FIRM: National TAB-Southeast
TAB PROFESSIONAL: J. Scott Springer
SIGNATURE: 
REGISTRATION NO: 3755 (NTAB) / 23312
CERTIFICATION EXP: 12/31/2023





National TAB

Testing, Adjusting, and Balancing Equipment



Function		Range	Minimum Accuracy	Instrument Information	Calibration Date	Date Due
AIR	AIR PRESSURE	0 in wg to 10 in wg	2% +/- 0.001 in wg	Shortridge ADM 880C - S/N M05066	9/28/2022	9/28/2023
	AIR VELOCITY INSTRUMENT	50 fpm to 3900 fpm	+/- 5 % +/- 7 fpm	Shortridge ADM 880C - S/N M05066	9/28/2022	9/28/2023
	DIRECT HOOD READING	100 cfm to 2000 cfm	+/- 3 % +/- 7 cfm	Shortridge ADM 880C - S/N M05066	9/28/2022	9/28/2023
TEMPERATURE	AIR METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/12/2022	10/12/2023
	AIR PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 5028	10/12/2022	10/12/2023
	IMMERSION METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/12/2022	10/12/2023
	IMMERSION PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 1075	10/12/2022	10/12/2023
	CONTACT METER	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - SRH77A S/N 081820093	10/12/2022	10/12/2023
	CONTACT PROBE	-20 F to 240 F	+/- .5 % 2 F	Cooper ATKINS - PD1388 7-6 S/N 4011	10/12/2022	10/12/2023
HUMIDITY	HUMIDITY PROBE	10 % RH to 90 % RH	3% of reading	Cooper ATKINS - SRH77A S/N 090315046	10/12/2022	10/12/2023
ELECTRICAL	VOLTAGE MEASUREMENT	0 VAC to 600 VAC	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/12/2022	10/12/2023
	AMPERAGE MEASUREMENT	0 Amperers to 100 Amperes	2 % reading +/- 5 digits	Dwyer CM-1 - S/N 190800099	10/12/2022	10/12/2023
ROTATION	ROTATION MEASUREMENT	60 rpm to 5000 rpm	2 % reading 2 rpm	Dwyer TAC-L - S/N S1100123	10/12/2022	10/12/2023
HYDRONIC	PRESSURE MEASUREMENT	-30 in Hg to 200 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
	DIFFERENTIAL PRESSURE MEASUREMENT	0 psi - 80 psi	±2% of reading +/- 1 psi	Dwyer 490W-6 - S/N 01L6NK	6/21/2023	6/20/2024
DALT	DUCT LEAKAGE	-10" - +10" wc	±1% of reading +/- .0004" wc	Kanomax DALT 6900 S/N: 080439	5/2023	5/2024



NATIONAL TAB
AIR DUCT LEAKAGE TEST SUMMARY



i N T E L L I G E N C E

Tested: 5/8/2023

PROJECT: NC009 HVAC-ELEC-PLUMB RESETS - 500 Wilshire Blvd Concord, NC 28025

ASSET: VARIOUS

LEAKAGE CLASS 6

SPECIFIED TEST PRESSURE (Pi) 4/1

DUCT CONSTRUCTION PRESSURE CLASS (Pc) A

DESIGN DATA				FIELD TEST DATA RECORD						
SUBJECT DUCT	SURFACE AREA IN FT ²	ALLOWABLE LEAKAGE		DIAMETER		PRESSURE " W.G.	DATE	PERFORMED BY	WITNESSED BY	ACTUAL CFM
		LIMIT	CFM	ORIFICE	TUBE	DUCT				
			(TEST SECTION)							
SUPPLY DUCT										
FCU-4	297	0.0603	17.91	3.75	4	1.01	5/8/2023	SS	Chris Hill	9.50
FCU-3	184	0.0615	11.32	3.75	4	1.04	5/8/2023	SS	Chris Hill	6.62
HVU-1	286	0.1488	42.56	3.75	4	3.99	5/8/2023	SS	Chris Hill	22.02
	767		71.78							38.14

REMARKS

TAB TEAM: National TAB
CONSTRUCTION TEAM: Team Construction NC

DATE: 5/8/2023



NATIONAL TAB
AIR DUCT LEAKAGE TEST SUMMARY



i N T E L L I G E N C E

Tested: 5/8/2023

PROJECT: NC009 HVAC-ELEC-PLUMB RESETS - 500 Wilshire Blvd Concord, NC 28025

ASSET: VARIOUS

LEAKAGE CLASS 3

SPECIFIED TEST PRESSURE (Pi) 4/1

DUCT CONSTRUCTION PRESSURE CLASS (Pc) A

DESIGN DATA				FIELD TEST DATA RECORD						
SUBJECT DUCT	SURFACE AREA IN FT ²	ALLOWABLE LEAKAGE		DIAMETER		PRESSURE " W.G.	DATE	PERFORMED BY	WITNESSED BY	ACTUAL CFM
		LIMIT	CFM	ORIFICE	TUBE	DUCT				
			(TEST SECTION)							
RETURN DUCT										
ERV Ex Duct	73.78	0.074109	5.47	3.75	4	-4.014	5/8/2023	SS	Chris Hill	2.54
FCU-10 Return Duct	86.1	0.030659	2.64	3.75	4	-1.03	5//2023	SS	Chris Hill	0.00
	159.88		8.11							2.54

REMARKS

TAB TEAM: National TAB

DATE: 5/8/2023

CONSTRUCTION TEAM: Team Construction NC



NATIONAL TAB
AIR DUCT LEAKAGE TEST SUMMARY



Tested: 8/1/2023

8/2/2023

I N T E L L I G E N C E

PROJECT: NC009 HVAC-ELEC-PLUMB RESETS - 500 Wilshire Blvd Concord, NC 28025

ASSET: VARIOUS

LEAKAGE CLASS 6/3

SPECIFIED TEST PRESSURE (P_i) 4/1

DUCT CONSTRUCTION PRESSURE CLASS (P_c) A

DESIGN DATA				FIELD TEST DATA RECORD							
SUBJECT DUCT	SURFACE AREA IN FT ²	ALLOWABLE LEAKAGE		DIAMETER		PRESSURE " W.G.	ACTUAL % CFM / SF	ACTUAL CFM	DATE	PERFORMED BY	WITNESSED BY
		LIMIT %	CFM	ORIFICE	TUBE						
		CFM / SF	(TEST SECTION)								
SUPPLY DUCT											
AHU-1 (6)	738.5	0.1488	109.89	3.75	4	3.98	0.05782	42.7	8/1/2023	SS	Chris Hill
HVU-2 (6)	286.4	0.1488	42.62	3.75	4	3.99	0.10754	30.8	8/2/2023	SS	Chris Hill
FCU-12 (3)	251.3	0.0608	15.28	3.75	4	1.04	0.02845	7.15	8/1/2023	SS	Chris Hill
FCU-13 (3)	86.7	0.0608	5.27	3.75	4	1.03	0.04867	4.22	8/2/2023	SS	Chris Hill

REMARKS

TAB TEAM: National TAB

DATE: 8/4/2023

CONSTRUCTION TEAM: Team Construction NC



NATIONAL TAB
AIR DUCT LEAKAGE TEST SUMMARY



Tested: 8/1/2023

8/2/2023

PROJECT: NC009 HVAC-ELEC-PLUMB RESETS - 500 Wilshire Blvd Concord, NC 28025

ASSET: VARIOUS

LEAKAGE CLASS 6/3

SPECIFIED TEST PRESSURE (Pi) 4/1

DUCT CONSTRUCTION PRESSURE CLASS (Pc) A

DESIGN DATA				FIELD TEST DATA RECORD							
SUBJECT DUCT	SURFACE AREA IN FT ²	ALLOWABLE LEAKAGE		DIAMETER		PRESSURE " W.G.	ACTUAL % CFM / SF	ACTUAL CFM	DATE	PERFORMED BY	WITNESSED BY
		LIMIT %	CFM	ORIFICE	TUBE	DUCT					
		CFM / SF	(TEST SECTION)								
RETURN DUCT											
AHU-1 (6)	330.5	0.1489	49.20	3.75	4	-4.02	0.12324	40.73	8/1/2023	SS	Chris Hill
FCU-12 (3)	141.3	0.0608	8.59	3.75	4	-1.08	0.05039	7.12	8/2/2023	SS	Chris Hill

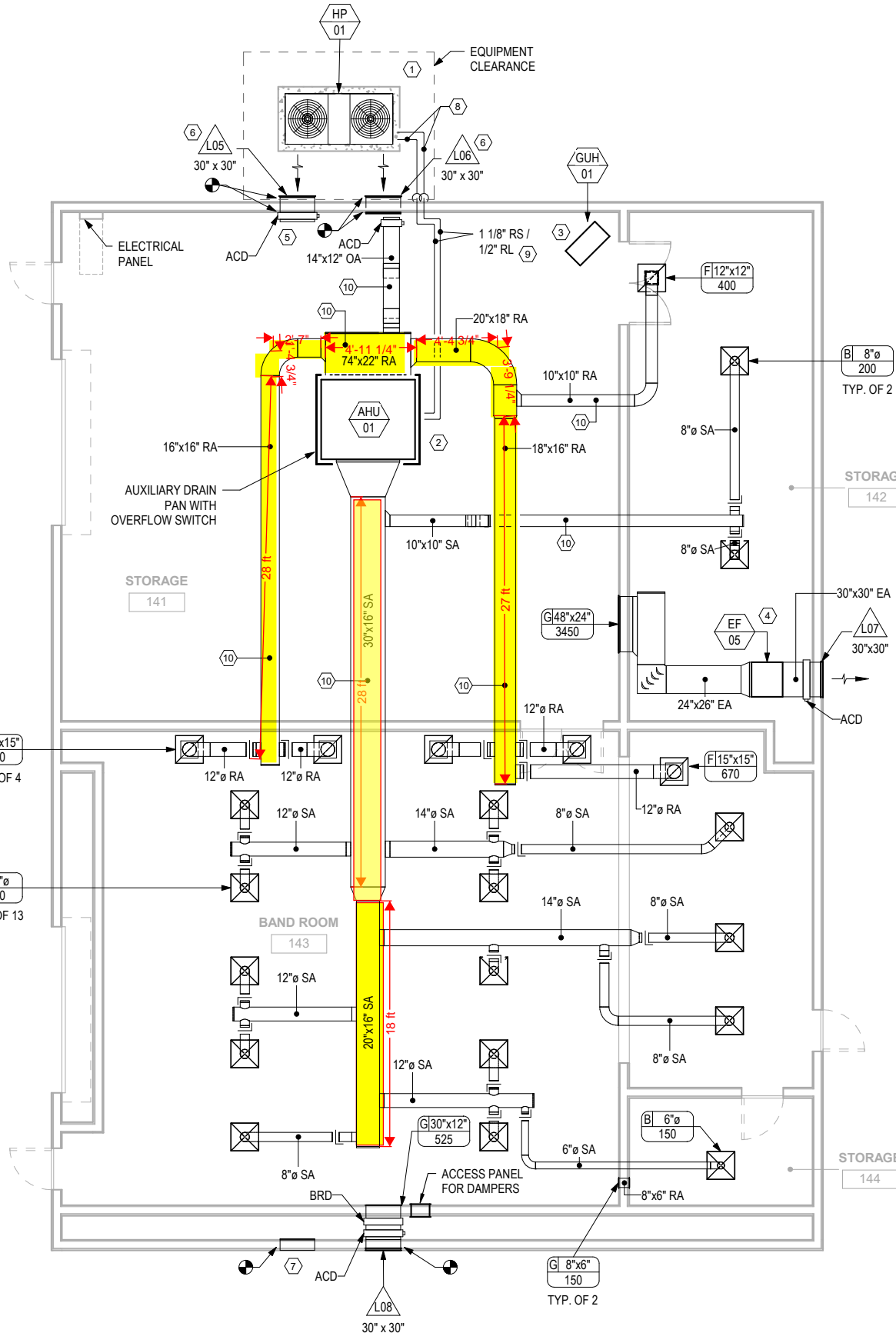
REMARKS

TAB TEAM: National TAB
CONSTRUCTION TEAM: Team Construction NC

DATE: 8/4/2023



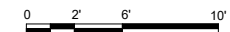
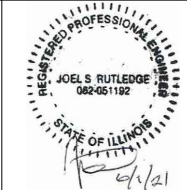
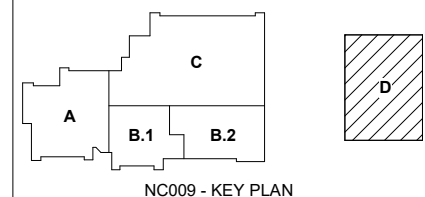
2 MECHANICAL ROOF PLAN - AREA D
3/16" = 1'-0"



1 MECHANICAL FIRST FLOOR DUCTWORK & PIPING PLAN - AREA D
3/16" = 1'-0"

SHEET KEY NOTES

- PROVIDE ON GRADE HEAT PUMP CONDENSING UNIT ON NEW CONCRETE EQUIPMENT PAD. ROUTE REFRIGERANT PIPING UTILIZING EXISTING PIPE PENETRATIONS TO INDOOR AIR HANDLER AHU-01. REFER TO MECHANICAL SCHEDULE ON M-603 FOR MORE INFORMATION.
- PROVIDE SUSPENDED INDOOR AIR HANDLER WITH VIBRATION ISOLATION HANGAR KIT. PROVIDE UNIT WITH DRAIN PAN WITH CONDENSATE Routed THROUGH EXTERIOR WALL TO DISCHARGE ON GRADE VIA SPLASH BLOCK. PROVIDE AUXILIARY DRAIN PAN UNDER UNIT WITH OVER FLOW DETECTION / SHUT OFF SWITCH. REFER TO P-111 FOR NEW CONDENSATE PIPE ROUTING. REFER TO MECHANICAL SCHEDULE ON M-603 FOR MORE INFORMATION.
- PROVIDE GAS-FIRED UNIT HEATER WITH HANGER KIT AND CONCENTRIC VENT / FLUE KIT. REFER TO MECHANICAL SCHEDULE ON M-601 FOR MORE INFORMATION. REFER TO P-111 FOR RECONNECTION TO NATURAL GAS PIPING.
- PROVIDE INLINE CABINET EXHAUST FAN FOR STORAGE 141 SUMMER VENTILATION PURPOSES. FAN SHALL BE INTERLOCKED WITH OPERATION OF LOUVER L-07. REFER TO MECHANICAL SCHEDULES FOR MORE INFORMATION.
- EXISTING 36"x36" LOUVER TO BE REUTILIZED FROM EF-08 INTAKE AIR. PROVIDE NEW DUCTWORK WITH AUTOMATIC AIR DAMPER AND OPEN ENDED DUCT TERMINATED WITH SAFETY SCREEN.
- PROVIDE INTAKE LOUVER RECONNECTED TO DUCT SLEEVE THROUGH EXTERIOR WALL FROM PREVIOUS EXHAUST LOUVER & BACK DRAFT DAMPER. SEAL WEATHER TIGHT. CONFIRM SIZE IN FIELD PRIOR TO PURCHASING. REFER TO DETAIL E8 / M-503 FOR MORE INFORMATION.
- PATCH OPENING FROM PREVIOUS LOUVER, SEAL WEATHER TIGHT AND MATCH TO EXISTING CONDITIONS OF EXTERIOR WALL. REFER TO M-508 FOR PATCHING DETAILS.
- EXTERIOR PIPE INSULATION SHALL HAVE JACKETING THAT IS HIGH UV, IMPACT, AND TEAR RESISTANT. JACKET APPLICATION SHALL BE SEALED WEATHER TIGHT. PIPE ENCLOSURE SHALL BE SEALED TO BE RODENT RESISTANT. REFER TO PIPE INSULATION SCHEDULE ON M-002 FOR MORE INFORMATION. REFER TO DETAIL E3, C6, C8 ON SHEET M-502 FOR ADDITIONAL DETAIL FOR EXTERIOR Routed REFRIGERANT PIPING.
- ROUTE REFRIGERANT SUCTION AND REFRIGERANT LIQUID LINES PER MANUFACTURER REQUIREMENTS. PIPE SIZES ARE FOR REFERENCE ONLY FROM BASIS OF DESIGN EQUIPMENT.
- DUCTWORK IN 141 SHALL BE RIGIDLY INSULATED AND PAINTED TO MATCH EXISTING CONDITIONS. REFER TO GENERAL NOTE 15 ON M-001 & DUCT INSULATION SCHEDULE ON M-002 FOR MORE INFORMATION.
- PROVIDE NEW LOUVER IN EXISTING 30" x 30" OPENING. CONFIRM SIZE IN FIELD PRIOR TO PURCHASING. PROVIDE AUTOMATED CONTROL DAMPER AND BAROMETRIC RELIEF DAMPER FOR OUTSIDE AIR RELIEF TO AHU-01 BY SIDE WALL GRILLE BELOW CEILING. PROVIDE 18" x 18" ACCESS PANEL ON SIDE WHERE DAMPER COMPONENTS THAT NEED ACCESS ARE LOCATED. ROOM PRESSURIZATION SHALL BE SET TO 0.1" W.C. AND SET DURING TAB TO MAINTAIN BAND ROOM POSITIVELY PRESSURIZED.



US Army Corps of Engineers

ISSUE DATE: JUNE 2021	CONTRACT No.: W912HP-20-D-5002
DESIGNED BY: A. RUSSELL	CHECKED BY: J. RUTLEDGE
US ARMY CORPS OF ENGINEERS CHARLESTON DISTRICT 60A HAGOOD AVE. CHARLESTON, SC 29412	SUBMITTED BY: J. RUTLEDGE
205 N. MICHIGAN AVE. CHICAGO, IL 60611 PH: 606-3400000-040	FILE NUMBER: ANSID
500 WILSHIRE AVE., CONCORD, NC 28025	MECHANICAL FIRST FLOOR DUCTWORK & PIPING PLAN - AREA D
NC009 HVAC - ELEC - PLUMB RESETS 8161 READINESS DIVISION	SHEET ID M-115