

Table with columns: REVISION, DATE, DESCRIPTION. Includes entries for L&L REVIEW, BID ISSUE, PERMITS.

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TEST AND BALANCE CORPORATION START-UP VERIFICATION CHECKLIST
STORE # LOCATION DATE
EQUIPMENT DESIGNATION MECH CHECK ELEC CHECK CONTROLS CHECK READY FOR TESTING INITIAL
RTU-1 RTU-2 RTU-3 RTU-4 EF-1 EF-2
COMPLETE THE ABOVE CHECKLIST ONLY WHEN EQUIPMENT IS INSTALLED BY THE ULTA G.C.
THIS CERTIFIES THAT THIS PROJECT IS FULLY COMPLETED AND READY FOR INDEPENDENT TESTING AND BALANCING CONTRACTOR TO PROCEED.
MECHANICAL CONTRACTOR (COMPANY) REVENUE DATE
INSTRUCTIONS
COMPLETION OF THIS START-UP VERIFICATION CHECKLIST BY THE APPROPRIATE INSTALLATION CONTRACTOR IS REQUIRED TO ENSURE THAT ALL EQUIPMENT AND SYSTEM COMPONENTS ARE COMPLETE, CORRECTLY INSTALLED, IN OPERATION AND READY FOR TESTING AND BALANCING WORK TO PROCEED.
TAB REQUIREMENTS
1. TAB CONTRACTOR TO COMPLETE THE FOLLOWING CHECKLIST AS PART OF TAB WORK AND INCLUDE THIS DATA AS PART OF THE TAB REPORT.
2. TAB CONTRACTOR TO CONTACT CODY HATCH AT NOVAV BY TELEPHONE WITH ON SITE TO COORDINATE OA DAMPER POSITION AND EMS PROGRAMMING. INDICATE CODY HATCH ON TABLE BELOW OR NAME OF OTHER CODY HATCH APPROVED NOVAV TECHNICIAN TO DOCUMENT COORDINATION WITH NOVAV. NOVAV WILL ONLY BE CONSIDERED COMPLETE IF THE FINISH COORDINATION WITH NOVAV IS COMPLETE AND DOCUMENTED.
3. VERIFY THE SPACE IS POSITIVELY PRESSURIZED. YES NO
4. STORES WILL BE RANDOMLY COMMISSIONED TO VERIFY TAB WORK. DEFICIENCY REPORTS WILL BE FORWARDED TO TAB CERTIFICATION AGENCIES.
CODY HATCH CONTACT INFO
CODY HATCH PROJECT MANAGER
NOVAV/HONEYWELL
8600 ROCKSIDE WOODS BLVD., SUITE 400
CLEVELAND, OH 44131
PHONE: 216.892.1882
CELL: 216.372.7827
EMAIL: cody.hatch@honeywell.com
EQUIPMENT DESIGNATION OA DAMPER POSITION % OPEN VERIFIED BY TAB CONTRACTOR TAB CONTRACTOR TO INDICATE DATE, TIME, AND NOVAV TECHNICIAN WHO COORDINATED OA DAMPER POSITION VIA TELEPHONE FOR EACH RTU
RTU-1 RTU-2 RTU-3 RTU-4
TAB CONTRACTOR TO PROVIDE A COMPLETE TAB REPORT TO EMS CONTRACTOR PRIOR TO EMS COMMISSIONING
GC TO CUT OUT AND COMPLETE FORM FOR INCLUSION IN TAB REPORT - GC TO COORDINATE SIGN OFF WITH INDICATED PARTIES. TAB REPORT IS CONSIDERED COMPLETE ONLY IF THIS DOCUMENT IS INCLUDED AS PART OF THE TAB REPORT

SECTION 19000
DUCTWORK SYSTEMS PER DRAWING PLANS AND DETAILS.
A. MANUFACTURE AND INSTALL DUCTWORK AS SHOWN ON DRAWINGS.
1. ALL SUPPLY AIR DUCTWORK SHALL BE CONSTRUCTED FOR 2" W.C.
2. ALL RETURN AIR DUCTWORK SHALL BE CONSTRUCTED FOR 2" W.C.
3. ALL EXHAUST DUCTWORK SHALL BE CONSTRUCTED FOR 2" W.C.
4. ALL DUCTWORK SHALL BE INSTALLED ACCURATELY, MECHANICALLY TIGHT AND RIGIDLY CONSTRUCTED. OFFSETS OF EXPOSED DUCTWORK SHALL BE MADE ON SHORT SIDES OF TRANSVERSE DUCT JOINTS IF SET IS LESS THAN 24 INCHES. METAL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
5. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
6. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
7. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
8. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
9. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
10. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.
11. DUCTWORK SHALL BE INSTALLED TO MAINTAIN CLEARANCES AS SHOWN ON DRAWINGS. UNLESS OTHERWISE SHOWN OR SPECIFIED, ALL UNINSULATED PANELS WIDER THAN 12 INCHES SHALL BE CROSS-BROKEN.

SECTION 19000
AUTOMATIC TEMPERATURE CONTROLS
PART 1 - GENERAL
1.01 RELATED WORK SPECIFIED ELSEWHERE:
A. IN ADDITION, THE FOLLOWING SECTIONS APPLY: 19050, AND 19800.
1.02 DESCRIPTION OF WORK
A. SEQUENCE OF OPERATION IS HEREBY DEFINED AS THE MANNER AND METHOD BY WHICH CONTROLS FUNCTION.
B. REQUIREMENTS (OAS) TYPE OF CONTROL SYSTEM OPERATION ARE SPECIFIED IN THIS SECTION.
C. OPERATING EQUIPMENT, DEVICES AND SYSTEM COMPONENTS REQUIRED FOR CONTROL SYSTEMS ARE SPECIFIED IN OTHER SECTIONS - IS CONTAINED IN THESE SPECIFICATIONS.
D. THIS SECTION DEFINES THE INSTALLATION OF THE AUTOMATIC TEMPERATURE CONTROLS REQUIRED AS SHOWN ON THE DRAWINGS AND AS HEREINAFTER SPECIFIED.
1.03 DEFINITIONS
A. AIC IS AUTOMATIC TEMPERATURE CONTROLS.
B. OPEN FOR MOTORIZED DAMPERS, THE POSITION OF THE BLADES THAT CREATES THE MAXIMUM FREE AREA POSSIBLE OF THE DAMPER WHICH ALLOWS PASSAGE OF AIR.
C. CLOSE FOR MOTORIZED DAMPERS, THE POSITION OF THE BLADES THAT PREVENTS ANY PASSAGE OF AIR.
D. MINIMUM FOR MOTORIZED DAMPERS, THE POSITION OF THE BLADES OTHER THAN OPEN WHERE THE BLADES ARE ADJUSTED TO GIVE THE REQUIRED MINIMUM CFM.
E. MAXIMUM FOR MOTORIZED DAMPERS, THE POSITION OF THE BLADES OTHER THAN CLOSE WHERE THE BLADES ARE ADJUSTED TO GIVE THE REQUIRED MAXIMUM CFM.
F. FINALLY SHALL BE THE POSITION WHERE THE EQUIPMENT OPERATES AND/OR OTHERWISE ACTIVATED TO A STAND-BY STATE AWAITING CONTROL SIGNALS FROM THE AIC SYSTEM.
G. FULLY OPERATING SHALL BE THE POSITION WHERE THE EQUIPMENT IS OPERATING AND PRODUCING THE DESIRED EFFECT.
H. OFF SHALL BE THE CONDITION WHERE THE EQUIPMENT IS NOT OPERATING AND IS STANDING BY IN AN IDLE STATE.
PART 2 - PRODUCTS
A. AUTOMATIC TEMPERATURE CONTROLS COMPONENTS SHALL BE ELECTRIC AND ELECTRONIC AS SHOWN ON THE DRAWING.
B. THE AIC SYSTEM SHALL CONSIST OF ALL NECESSARY THERMOSTATS, THERMISTERS, HEATER, CONTROLS, DAMPERS, OPERATORS, RELAYS, CONTROL PANELS, THERMISTERS, GAUGES, TIME CLOCKS, AND ALL ACCESSORIES AND ELECTRIC WIRING TO FULFILL THE INTENT OF THIS SPECIFICATION.
2.02 CONTRACTOR
A. THE CONTROL SYSTEM SHALL BE SUPERVISED AND INSTALLED BY COMPETENT CONTROL MECHANICS AND ELECTRICIANS REGULARLY EMPLOYED BY THE CONTRACTOR.
2.03 WORK TO BE PERFORMED BY OTHER TRADES
A. THE FOLLOWING INCIDENTAL WORK SHALL BE PROVIDED BY THE MECHANICAL CONTRACTORS UNDER THE SUPERVISION OF THE AIC CONTRACTOR AND THE ELECTRICAL CONTRACTOR.
1. THE MECHANICAL CONTRACTOR SHALL:
a. INSTALL ALL AUTOMATIC DAMPERS.
b. ASSEMBLE MULTIPLE SECTION DAMPERS WITH REQUIRED INTAKE-CONNECTING LINES AND EXTEND REQUIRED NUMBER OF SIZES THROUGH DUCT FOR EXTERNAL MOUNTING OF DAMPER MOTORS.
c. PROVIDE ACCESS THROUGH DUCTS FOR EXTERNAL MOUNTING OF DAMPER MOTORS.
d. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.
e. INSTALL SMOKE DETECTORS.
2. THE ELECTRICAL CONTRACTOR SHALL:
a. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.
b. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.
c. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.
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x. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.
y. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.
z. PROVIDE ACCESS THROUGH DUCTS FOR SERVICE TO CONTROL EQUIPMENT.

SECTION 19000
TEST AND BALANCE MECHANICAL SYSTEM SPECIFICATIONS
PART 1 - GENERAL
1.01 SUMMARY
A. SECTION INCLUDES TESTING, ADJUSTING, AND BALANCING OF AIR, WATER, AND REFRIGERATION SYSTEMS AND MEASUREMENT OF FINAL OPERATING CONDITION OF HVAC SYSTEMS.
1.02 REFERENCES
A. AMBC (ASSOCIATED AIR BALANCING COUNCIL) - NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE.
B. NEBB (NATIONAL ENVIRONMENTAL BALANCING BUREAU) - PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, AND BALANCING OF ENVIRONMENTAL SYSTEMS.
C. TABS (TESTING, ADJUSTING AND BALANCING BUREAU) - INTERNATIONAL STANDARD FOR ENVIRONMENTAL SYSTEMS BALANCE.
1.03 SUBMITTALS
A. TEST REPORTS, THE TAB REPORT SHALL BE IN THE FORMAT OF THE AMBC NATIONAL STANDARD REPORT OR THE NEBB CERTIFIED REPORT FORMS AS PUBLISHED IN THEIR MOST CURRENT EDITIONS.
B. FURNISH FOUR COPIES OF REPORTS, COMPLETE WITH TABLE OF CONTENTS PAGE AND INDEXING TABS AND WITH COVER IDENTIFICATION AT FRONT, IDENTIFIED TO CORRESPOND WITH DATA SHEETS, AND INDICATING THERMOSTAT LOCATIONS.
C. INCLUDE A COPY OF AMBC NATIONAL PROJECT PERFORMANCE GUARANTEE COPY OF NEBB CERTIFICATE OF CONFORMANCE CERTIFICATION OR TABS QUALITY ASSURANCE PROGRAM FOR ENVIRONMENTAL SYSTEMS BALANCE.
1.04 QUALITY ASSURANCE
A. PERFORM WORK IN ACCORDANCE WITH AMBC NATIONAL STANDARDS FOR FIELD MEASUREMENTS AND INSTRUMENTATION, TOTAL SYSTEM BALANCE OR NEBB PROCEDURAL STANDARDS FOR TESTING, BALANCING, AND ADJUSTING OF ENVIRONMENTAL SYSTEMS.
1.05 QUALIFICATIONS
A. THE TESTING, ADJUSTING, AND BALANCING (TAB) OF ALL WORK SHALL BE PERFORMED BY AN INDEPENDENT CONTRACTOR THAT IS CURRENTLY LICENSED BY AMBC OR NEBB. THE COMPANY SHALL SPECIALIZE IN TAB OF SYSTEMS SPECIFIED IN THIS SECTION AND SHALL HAVE A MINIMUM THREE YEARS DOCUMENTED EXPERIENCE CERTIFIED BY AMBC OR NEBB.
B. PERFORM WORK UNDER SUPERVISION OF AMBC CERTIFIED TEST AND BALANCE ENGINEER OR NEBB CERTIFIED TESTING, BALANCING AND ADJUSTING SUPERVISOR EXPERTISE IN PERFORMANCE OF THE WORK AND LOCATED AT PLACE WHERE PROJECT IS LOCATED.
1.06 TIMING
A. THE COMPLETE TAB REPORTS SHALL BE PROVIDED TO THE OWNER NO LATER THAN ONE (1) WEEK PRIOR TO CONSTRUCTION END DATE.
PART 2 - PRODUCTS
NONE USED
PART 3 - EXECUTION
3.01 HVAC CONTRACTOR RESPONSIBILITIES
A. THE HVAC CONTRACTOR SHALL VERIFY THAT THE HVAC SYSTEMS ARE COMPLETE AND OPERABLE BEFORE TAB WORK IS STARTED. THE HVAC CONTRACTOR SHALL BE PRESENT DURING THE TESTING, ADJUSTING, AND BALANCING OF THE HVAC SYSTEM TO PROVIDE ASSISTANCE TO THE TAB CONTRACTOR. REQUIREMENTS INCLUDE THE FOLLOWING:
1. SYSTEMS ARE STARTED AND OPERATING IN SAFE AND NORMAL CONDITION.
2. TEMPERATURE CONTROLS SYSTEMS ARE INSTALLED COMPLETE AND OPERABLE.
3. BALANCING DEVICES AND HVAC EQUIPMENT ARE ACCESSIBLE.
4. PROPER THERMAL OVERLOAD PROTECTION IS IN PLACE FOR ELECTRICAL EQUIPMENT.
5. NEW AIR FILTERS ARE INSTALLED JUST PRIOR TO AIR BALANCE AND IMMEDIATELY AFTER PROJECT IS COMPLETE.
6. DUCT SYSTEMS ARE CLEAN AND FREE OF OBSTRUCTIONS.
7. FAN AND HEATING COILS ARE CLEAN AND OPERABLE.
8. AIR COILS ARE CLEAN AND OPERABLE.
9. ACCESS DOORS ARE INSTALLED AND CONNECTED.
10. AIR OUTLETS ARE INSTALLED AND CONNECTED.
11. AIR OUTLETS ARE FLUSHED, FILLED, AND VENTED.
12. DAMPER SYSTEMS ARE INSTALLED AND OPERABLE.
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SECTION 19000
SEISMIC CONTROLS FOR MEFP SYSTEMS:
SEISMIC BRACING OF MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS SHALL BE INSTALLED AS REQUIRED BY LOCAL ADOPTED CODES. SEISMIC BRACING MEASURES TO BE APPLIED TO MECHANICAL/ELECTRICAL/PLUMBING EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND/OR FEDERAL CODES AS WELL AS MANUFACTURER'S REQUIREMENTS. REFER TO ARCHITECTURAL AND/OR STRUCTURAL FOR ADDITIONAL BRACING DETAILS AND INFORMATION.

SECTION 19000
AIR SYSTEM PROCEDURE
A. VERIFY AIR HANDLING AND DISTRIBUTION SYSTEM TO OBTAIN REQUIRED OR DESIGN SUPPLY, RETURN, AND EXHAUST QUANTITIES (ASBESTE ALTIUDE).
B. MAKE QUANTITY MEASUREMENTS IN MAIN DUCTS BY PILOT TUBE TRVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.
C. MAKE QUANTITY MEASUREMENTS IN MAIN DUCTS BY PILOT TUBE TRVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.
D. MAKE QUANTITY MEASUREMENTS IN MAIN DUCTS BY PILOT TUBE TRVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.
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Z. MAKE QUANTITY MEASUREMENTS IN MAIN DUCTS BY PILOT TUBE TRVERSE OF ENTIRE CROSS SECTIONAL AREA OF DUCT.

SECTION 19000
3.05 REPORTS
A. REFER TO PLANS FOR EQUIPMENT DESIGN DATA SCHEDULES.
B. REPORT FORMS:
1. NAME OF TESTING, ADJUSTING, AND BALANCING AGENCY.
2. ADDRESS OF TESTING, ADJUSTING, AND BALANCING AGENCY.
3. TELEPHONE AND FACSIMILE NUMBERS OF TESTING, ADJUSTING, AND BALANCING AGENCY.
4. AMBC OR NEBB CERTIFICATION NUMBER AND SIGNATURE OF CONTRACTOR.
5. PROJECT NAME.
6. PROJECT LOCATION.
7. PROJECT ARCHITECT.
8. PROJECT ENGINEER.
9. PROJECT CONTRACTOR.
10. PROJECT ALTIUDE.
11. DATE TAB WAS PERFORMED.
C. SUMMARY COMMENTS:
1. COPY OF CERTIFICATE OF CONFORMANCE WITH NATIONAL STANDARDS (AMBC OR NEBB) FOR THIS PROJECT.
2. ACTUAL SPACE TEMPERATURES WITH CORRESPONDING THERMOSTAT SET POINTS FOR EACH UNIT.
3. DESIGN VERSUS FINAL PERFORMANCE.
4. NOMINAL CHARACTERISTICS OF SYSTEM.
5. DESCRIPTION OF SYSTEMS OPERATION REPORT.
6. SUMMARY OF OUTDOOR AND EXHAUST FLOWS TO INDICATE BUILDING PRESSURIZATION.
7. MANUFACTURE USED THROUGHOUT REPORT.
8. TEST CONDITIONS.
D. INSTRUMENT LIST:
1. INSTRUMENT.
2. MANUFACTURER.
3. MODEL NUMBER.
4. SERIAL NUMBER.
5. RANGE.
6. CALIBRATION DATE.
E. AIR DISTRIBUTION TEST SHEET:
1. AIR TERMINAL NUMBER.
2. ROOM NUMBER/LOCATION.
3. TERMINAL TYPE.
4. TERMINAL SIZE.
5. AREA FACTOR.
6. AIR VELOCITY.
7. DESIGN AIR FLOW.
8. DESIGN VELOCITY.
9. DESIGN AIR FLOW.
10. DESIGN VELOCITY.
11. TEST (FINAL) AIR FLOW.
12. TEST (FINAL) VELOCITY.
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14. TEST (FINAL) VELOCITY.
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SEISMIC CONTROLS FOR MEFP SYSTEMS:
SEISMIC BRACING OF MECHANICAL, ELECTRICAL, AND PLUMBING SYSTEMS SHALL BE INSTALLED AS REQUIRED BY LOCAL ADOPTED CODES. SEISMIC BRACING MEASURES TO BE APPLIED TO MECHANICAL/ELECTRICAL/PLUMBING EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, AND/OR FEDERAL CODES AS WELL AS MANUFACTURER'S REQUIREMENTS. REFER TO ARCHITECTURAL AND/OR STRUCTURAL FOR ADDITIONAL BRACING DETAILS AND INFORMATION.

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Table with columns: DESIGN BY, CHECKED BY, JOB NUMBER, SHEET NUMBER, DATE. Includes entries for SK, HCB, 19047, M-5.

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