

SECTION 23 00 00 - MECHANICAL GENERAL REQUIREMENTS

- PART 1 - GENERAL
1. THE TERM "TENANT," "TENANT'S CONSTRUCTION MANAGER," "OWNER," OR "OWNER'S CONSTRUCTION MANAGER" SHALL REFER TO SWEETGREEN.
2. THE GENERAL CONTRACTOR SHALL PROVIDE ALL MATERIALS AND LABOR AS REQUIRED TO PROVIDE A COMPLETE WORKING SYSTEM AND AS DESCRIBED IN THESE DRAWINGS.
3. THE GENERAL CONTRACTOR SHALL REVIEW A COMPLETE SET OF THE CONSTRUCTION DOCUMENTS. EACH SUB-CONTRACTOR SHALL MAINTAIN A COMPLETE SET OF DRAWINGS ON SITE DURING THE CONSTRUCTION PROCESS.
4. COORDINATE WORK AS REQUIRED WITH THE LANDLORD. THE GENERAL CONTRACTOR SHALL UTILIZE LANDLORD-REQUIRED CONTRACTORS AT THE GENERAL CONTRACTOR'S EXPENSE.
PART 2 - PRODUCTS
1. PRODUCTS SHALL BE AS DESCRIBED IN THE DRAWINGS AND AS REQUIRED FOR A COMPLETE AND FUNCTIONING SYSTEM.
PART 3 - EXECUTION
UNLESS DIMENSIONS HAVE BEEN PROVIDED, THE DRAWINGS ARE DIAGRAMMATIC IN NATURE, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT AND REQUIRED EQUIPMENT. THEY SHALL NOT BE SCALED. COORDINATE WITH THE ARCHITECTURAL DRAWINGS, TENANT VENDORS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS AND CUTSHEETS AS REQUIRED.
2. COMPLETE ALL WORK IN COMPLIANCE WITH THE CODES LISTED ON SHEET G-001 INCLUDING ALL LOCAL AMENDMENTS, ALL RELEVANT NFPA CODES AND STANDARDS AND SMACNA STANDARDS.
A. VERIFY ALL CODE REQUIREMENTS AND LOCAL AMENDMENTS WITH THE AUTHORITY HAVING JURISDICTION PRIOR TO BID.
B. WHEN THERE IS A DISCREPANCY BETWEEN THE ADOPTED CODES AND THESE DRAWINGS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.
3. COORDINATE WITH THE LOCAL AUTHORITY HAVING JURISDICTION AND ARRANGE ALL INSPECTIONS AS REQUIRED.
4. MAINTAIN A CLEAN CONSTRUCTION SITE DURING CONSTRUCTION. CLEAN SCRAP MATERIAL AND REMOVE FROM SITE DAILY AND MAINTAIN WORKING AREA IN AN ORDERLY FASHION.
5. PROVIDE SUBMITTALS AS NOTED IN THESE SPECIFICATIONS AND AS REQUESTED BY THE TENANT'S CONSTRUCTION MANAGER.
A. ALL SHOP DRAWINGS SHALL BE REVIEWED AND STAMPED BY THE GENERAL CONTRACTOR PRIOR TO SUBMITTING TO THE TENANT'S CONSTRUCTION MANAGER.
B. SHOP DRAWINGS SHALL BE SUBMITTED TO ALLOW FOR FIVE BUSINESS DAYS OF REVIEW TIME.
6. PROVIDE REQUESTS FOR INFORMATION TO THE TENANT'S CONSTRUCTION MANAGER.
7. REQUESTS FOR INFORMATION SHALL PROVIDE A DETAILED DESCRIPTION OF THE SITE CONDITION OR DISCREPANCY AND THE CONTRACTORS PROPOSED REMEDY.
8. REQUESTS FOR INFORMATION SHALL BE SUBMITTED TO ALLOW FOR FIVE BUSINESS DAYS OF REVIEW TIME.
7. UPON COMPLETION OF WORK, THE GENERAL CONTRACTOR SHALL PROVIDE THE TENANT'S CONSTRUCTION MANAGER WITH A BOUND RECORD OF ALL MECHANICAL EQUIPMENT UTILIZED IN THE JOB. THE GENERAL CONTRACTOR SHALL PROVIDE THE SAME INFORMATION ON A COMPACT DISC. THE DISKET SHALL CONTAIN:
A. COVER SHEET INDICATING THE PROJECT NAME, ADDRESS AND TURNOVER DATE.
B. COMPANY NAME AND CONTACT INFORMATION OF THE CONTRACTORS UTILIZED FOR THE MECHANICAL SCOPE OF WORK.
C. CUTSHEETS, INSTALLATION MANUALS AND MAINTENANCE REQUIREMENTS FOR ALL MECHANICAL EQUIPMENT.
8. UPON COMPLETION OF WORK, THE GENERAL CONTRACTOR SHALL PROVIDE THE TENANT'S CONSTRUCTION MANAGER A FULL SET OF DRAWINGS WITH ANY DEVIATIONS FROM THE DRAWINGS INDICATED IN RED INK.

(END OF SECTION 23 00 00)

SECTION 23 05 93 - TESTING, ADJUSTING AND BALANCING FOR HVAC

- PART 1 - GENERAL
1. SYSTEM ASSURANCE: ALL TESTING AND BALANCING WORK SHALL BE COMPLETED BY AN INDEPENDENT CONTRACTOR, CERTIFIED BY NEBB OR TABB AS A TAB TECHNICIAN. BALANCE THE SYSTEM IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS.
PART 2 - PRODUCTS: NA
PART 3 - EXECUTION
1. AIR SYSTEMS
A. PROVIDE ALL LABOR AND MATERIALS REQUIRED TO BALANCE THE SYSTEM AS NOTED ON THE PLANS.
B. FAN SYSTEMS SHALL BE ADJUSTED SUCH THAT THE LOWEST FAN SPEED IS UTILIZED TO DELIVER THE REQUIRED CFM TO THE AIR TERMINALS.
C. ADJUST DAMPERS AS REQUIRED TO BALANCE THE SUPPLY, RETURN AND EXHAUST DEVICES TO 10% OF THE DESIGN RATES. ADJUST THE OUTSIDE AIR DAMPER AS REQUIRED TO OBTAIN THE MINIMUM OUTSIDE AIR REQUIREMENTS AS NOTED IN THE SCHEDULES.
D. RECORD THE OPERATING VOLTAGE, AMPACITY, SUPPLY/RETURN SYSTEM STATIC PRESSURES, SUPPLY/RETURN AIR TEMPERATURES (BOTH HEATING AND COOLING) AND FINAL FAN RPM.
E. VERIFY SYSTEM CONTROLS ARE FUNCTIONING AS INTENDED.
2. REPORTING
A. THE TEST AND BALANCE AGENT SHALL PREPARE A REPORT INCLUDING THE FINAL VALUES OF THE AIR AND WATER SYSTEM BALANCING, SYSTEM DIAGRAMS, AND SYSTEM NOTES.
B. THE GENERAL CONTRACTOR SHALL REVIEW THE FINAL BALANCE REPORT PRIOR TO SENDING TO THE TENANT'S CONSTRUCTION MANAGER.
C. PROVIDE TAB REPORT TO THE LANDLORD AND THE AUTHORITY HAVING JURISDICTION AS REQUIRED.

(END OF SECTION 23 05 93)

SECTION 23 07 13 - DUCT INSULATION

- PART 1 - GENERAL
1. INSULATION SHALL BE PROVIDED ON THE FOLLOWING DUCT SERVICES:
A. INDOOR, CONCEALED SUPPLY AND OUTDOOR AIR.
B. INDOOR, CONCEALED RETURN.
C. INDOOR, CONCEALED OVEN AND WAREWASH EXHAUST FROM AIR TERMINAL TO PENETRATION OF BUILDING EXTERIOR.
D. INDOOR, CONCEALED GENERAL EXHAUST FROM AIR TERMINAL TO PENETRATION OF BUILDING EXTERIOR.
E. OUTDOOR, SUPPLY AND RETURN.
2. QUALITY ASSURANCE
A. INSULATION INSTALLED INDOORS SHALL HAVE A FLAME-SPREAD INDEX OF 25 OR LESS, AND SMOKE-DEVELOPED INDEX OF 50 OR LESS.
B. INSULATION INSTALLED OUTDOORS SHALL HAVE A FLAME-SPREAD INDEX OF 75 OR LESS, AND SMOKE-DEVELOPED INDEX OF 150 OR LESS.
PART 2 - PRODUCTS
1. INTERIOR DUCTWORK SHALL HAVE FLEXIBLE FIBERGLASS DUCT WRAP LAMINATED TO FOIL REINFORCED KRAFT VAPOR BARRIER FACINGS WITH 2" STAPLING FLANGE AND AN INSTALLED THICKNESS OF 1-1/2" WITH AN R-VALUE OF 6.0.
2. EXTERIOR DUCTWORK SHALL BE INSULATED WITH 2" THICK RIGID INSULATION WITH A MINIMUM R-VALUE OF 12.0, PROTECTED WITH ROOFING MEMBRANE.
PART 3 - EXECUTION
1. PREPARATION: CLEAN AND DRY SURFACES. REMOVE MATERIALS THAT WILL ADVERSELY AFFECT INSULATION APPLICATION.
2. GENERAL INSTALLATION REQUIREMENTS:
A. INSTALL INSULATION ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
B. INSTALL INSULATION AND ACCESSORIES AND FINISHES WITH SMOOTH, STRAIGHT AND EVEN SURFACES. FREE OF VOIDS THROUGHOUT THE LENGTH OF DUCT AND FITTINGS.
C. INSTALL ACCESSORIES COMPATIBLE WITH INSULATION MATERIALS AND SUITABLE FOR THE SERVICE. ACCESSORIES SHALL NOT CORRODE, SOFTEN OR OTHERWISE ATTACK INSULATION OR JACKET IN EITHER WET OR DRY STATE.
D. INSTALL INSULATION WITH LONGITUDINAL SEAMS AT TOP OF HORIZONTAL RUNS. LONGITUDINAL SEAMS AND END JOINTS SHALL BE TIGHT. BOND SEAMS AND JOINTS WITH ADHESIVE RECOMMENDED BY INSULATION MANUFACTURER TO MAINTAIN VAPOR BARRIER INTEGRITY.
E. APPLY ADHESIVES, MASTICS AND SEALANTS AT MANUFACTURER'S RECOMMENDED COVERAGE RATE.
F. CUT INSULATION IN A MANNER TO AVOID COMPRESSING INSULATION MORE THAN 75 PERCENT ITS NOMINAL THICKNESS.
3. PENETRATIONS
A. ROOF PENETRATIONS: INSTALL INSULATION CONTINUOUSLY THROUGH ROOF PENETRATIONS. FOR APPLICATIONS REQUIRING ONLY INDOOR INSULATION, TERMINATE INSULATION ABOVE ROOF SURFACE AND SEAL WITH JOINT SEALANT. FOR APPLICATIONS REQUIRING INDOOR AND OUTDOOR INSULATION, INSTALL INSULATION FOR OUTDOOR APPLICATIONS TIGHTLY JOINED TO INDOOR INSULATION ENDS. SEAL JOINT WITH JOINT SEALANT.
B. WALL PENETRATIONS: INSTALL INSULATION CONTINUOUSLY THROUGH WALL PENETRATIONS. FOR APPLICATIONS REQUIRING ONLY INDOOR INSULATION, TERMINATE INSULATION ABOVE ROOF SURFACE AND SEAL WITH JOINT SEALANT. FOR APPLICATIONS REQUIRING INDOOR AND OUTDOOR INSULATION, INSTALL INSULATION FOR OUTDOOR APPLICATIONS TIGHTLY JOINED TO INDOOR INSULATION ENDS. SEAL JOINT WITH JOINT SEALANT.
C. INTERIOR WALLS: INSTALL INSULATION CONTINUOUSLY THROUGH WALLS AND PARTITIONS THAT ARE NOT FIRE RATED. TERMINATE INSULATION AT FIRE DAMPER SLEEVES FOR FIRE-RATED WALL AND PARTITION PENETRATIONS. EXTERNALLY INSULATE THE DAMPER SLEEVES TO MATCH ADJACENT INSULATION AND OVERLAP DUCT INSULATION AT LEAST 2 INCHES.

(END OF SECTION 23 07 13)

SECTION 23 31 13 - METAL DUCTS

- PART 1 - GENERAL
1. SECTION INCLUDES
A. RECTANGULAR DUCTS AND FITTINGS
B. ROUND DUCTS AND FITTINGS
C. DOUBLE-WALL DUCTWORK AND FITTINGS
D. FLAT OVAL DUCTS AND FITTINGS
E. SHEET METAL MATERIALS
F. SEALANTS AND GASKETS
G. HANGERS AND SUPPORTS
2. PERFORMANCE REQUIREMENTS
A. DUCT CONSTRUCTION, INCLUDING SHEET METAL THICKNESS, SEAM AND JOINT CONSTRUCTION, REINFORCEMENTS AND HANGERS/SUPPORTS SHALL COMPLY WITH THE LATEST VERSION OF SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
B. DUCT HANGERS AND SUPPORTS SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS UNDER CONDITIONS DESCRIBED IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
C. SURFACES IN CONTACT WITH THE AIRSTREAM SHALL COMPLY WITH REQUIREMENTS IN ANSI/ASHRAE 62.1.
3. SECTION REQUIREMENTS
A. SUBMITTALS: NONE REQUIRED.
PART 2 - PRODUCTS
1. RECTANGULAR DUCTS AND FITTINGS:
A. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS NOTED OTHERWISE.
B. TRAVERSE JOINTS: SELECT JOINT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-1 FOR STATIC PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS AND OTHER PROVISIONS AS REQUIRED.
C. LONGITUDINAL SEAMS: SELECT SEAM TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 2-2 FOR STATIC PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS AND OTHER PROVISIONS AS REQUIRED.
D. ELBOWS, TRANSITIONS OF BRANCH CONNECTIONS AND OTHER DUCT CONSTRUCTION: SELECT TYPES AND FABRICATE ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 4 FOR STATIC-PRESSURE CLASS, APPLICABLE SEALING REQUIREMENTS, MATERIALS INVOLVED, DUCT SUPPORT INTERVALS AND OTHER PROVISIONS AS REQUIRED.
2. ROUND DUCTS AND FITTINGS:
A. SPIRAL LOCK SEAM, WITHOUT INSULATION.
B. BASIS OF DESIGN: LINDAB SAFE SINGLE WALL DUCTS AND FITTINGS. ALTERNATES BY MCGILL AIRFLOW. ALL DUCTWORK SHALL BE PREPPED AND READY TO RECEIVE PAINT.
3. FLAT OVAL DUCTS AND FITTINGS:
A. SPIRAL LOCK SEAM, WITHOUT INSULATION.
B. BASIS OF DESIGN: LINDAB FOSR FLAT-OVAL SPIRAL DUCTS AND FITTINGS. ALTERNATES BY MCGILL AIRFLOW. ALL DUCTWORK SHALL BE PREPPED AND READY TO RECEIVE PAINT.
4. DOUBLE-WALL DUCTWORK AND FITTINGS:
A. SPIRAL LOCK SEAM, WITH 1" INSULATION THICKNESS.
B. BASIS OF DESIGN: LINDAB SAFE DOUBLE WALL DUCTS AND FITTINGS. ALTERNATES BY MCGILL AIRFLOW.
5. MATERIALS: GALVANIZED SHEET STEEL, COMPLY WITH ASTM A 653A 653M, G90 COATING DESIGNATION.
6. SEALANTS AND GASKETS:
A. MAXIMUM FLAME-SPREAD INDEX: 25 (WHEN TESTED ACCORDING TO UL 723).
B. MAXIMUM SMOKE-DEVELOPED INDEX: 50 (WHEN TESTED ACCORDING TO UL 723).
C. TWO-PART TAPE SEALING SYSTEM: PROVIDE 3" TAPE CONSTRUCTED OF WOVEN COTTON FIBER IMPREGNATED WITH MINERAL GYPSUM AND MODIFIED ACRYLIC/SILICONE TO FORM A HARD, DURABLE AIR/TIGHT SEAL. SEALANT SHALL BE A MODIFIED STYRENE ACRYLIC, COMPATIBLE WITH GALVANIZED SHEET STEEL, WATER, MOLD AND MILDEW RESISTANT, VOC CONTENT OF 20% OR LESS.
D. WATER BASED JOINT AND SEAM SEALANT: BRUSH ON WITH MINIMUM OF 65% SOLIDS CONTENT. MINIMUM SHORE A HARDNESS OF 20. COMPATIBLE WITH GALVANIZED SHEET STEEL. WATER, MOLD AND MILDEW RESISTANT. VOC CONTENT OF 75g/L (LESS WATER).
7. HANGERS AND SUPPORT:
A. RECTANGULAR DUCTWORK: HANGER RODS SHALL BE CADMIUM-PLATED STEEL RODS AND NUTS. STRAP AND ROD SIZE SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1. SECURE TO DUCT WITH SHEET METAL SCREWS COMPATIBLE WITH DUCT MATERIALS.
B. ROUND DUCTWORK: SUPPORT WITH AIRCRAFT CABLE COMPLYING WITH ASTM A 603. CONNECT ENDS WITH CADMIUM-PLATED STEEL ASSEMBLIES WITH BRACKETS, SWIVEL AND BOLTS DESIGNED FOR DUCT HANGER SERVICE.
C. EXTERIOR DUCTWORK SHALL BE PROVIDED WITH DUCT SUPPORTS, SPACED PER THE MANUFACTURER'S RECOMMENDATIONS.
PART 3 - EXECUTION
1. INSTALLATION
A. DRAWING PLANS, SCHEMATICS AND DIAGRAMS INDICATE GENERAL LOCATION AND ARRANGEMENT OF DUCTWORK ROUTING. COORDINATE INSTALLATION WITH WORK OF ALL OTHER TRADES AND EXISTING CONDITIONS. ACCOMMODATE DUCT HANGER, RODS, INSULATION AND OTHER REQUIREMENTS AS REQUIRED.
B. INSTALL DUCTS ACCORDING TO SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" IN MAXIMUM PRACTICAL LENGTHS WITH FEWEST POSSIBLE JOINTS.
C. UNLESS NOTED OTHERWISE, ALL DUCTS PARALLEL AND PERPENDICULAR TO BUILDING LINES.
D. INSTALL DUCTS WITH CLEARANCES AS REQUIRED TO ACCOMMODATE THE INSTALLATION OF INSULATION.
E. INSTALLATION OF EXPOSED DUCTWORK: PROTECT DUCTWORK FROM DAMAGE. REPAIR/REPLACE ALL DAMAGED SECTIONS AND FINISHED WORK. TRIM SEALANTS FLUSH WITH METAL. CREATE A SMOOTH AND UNIFORM EXPOSED BEAD. DO NOT USE TWO-PART TAPING SYSTEM. MAINTAIN CONSISTENCY, SYMMETRY AND UNIFORMITY IN THE INSTALLATION.
2. DUCT SEALING: CONSTRUCT DUCTS WITH 2 INCH POSITIVE AND NEGATIVE DUCT PRESSURE CLASSIFICATIONS.
3. HANGER AND SUPPORT INSTALLATION: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," CHAPTER 5. HANGERS EXPOSED TO VIEW SHALL BE AIRCRAFT CABLE. ACCOMMODATE WITH THE MECHANICAL DETAILS.
4. CONNECTIONS: MAKE CONNECTIONS TO EQUIPMENT WITH FLEXIBLE CONNECTORS COMPLYING WITH SECTION 23 33 00 "AIR DUCT ACCESSORIES." COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR BRANCH, OUTLET AND INLET, AND TERMINAL UNIT CONNECTIONS.
5. CLEANING: CLEAN ALL EXISTING DUCTWORK TO REMAIN PRIOR TO TESTING, ADJUSTING AND BALANCING. REMOVE ALL SURFACE CONTAMINANTS AND DEPOSITS ON AIR OUTLETS AND INLETS PRIOR TO PUNCH.
6. PROVIDE AIR BALANCE IN ACCORDANCE WITH SECTION 23 05 93 "TESTING, ADJUSTING, AND BALANCING FOR HVAC."
7. DUCT ELBOWS
A. RECTANGULAR: PROVIDE HOLLOW-FORMED, DOUBLE-THICKNESS TURNING VANES OR RADIUS'ED ELBOWS WITH INSIDE RADIUS NO SMALLER THAN 1/2 OF THE DUCT WALL THICKNESS.
B. ROUND DUCT ELBOWS: PROVIDE RADIUS'ED ELBOWS WITH AN INSIDE RADIUS NO SMALLER THAN 1/2 OF THE DUCT WIDTH.
8. BRANCH CONNECTIONS
A. RECTANGULAR: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 4-6. RECTANGULAR MAIN TO RECTANGULAR BRANCH SHALL BE A 45-DEGREE ENTRY. RECTANGULAR MAIN TO ROUND BRANCH SHALL BE A SPIN-IN FITTING.
B. ROUND: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," FIGURE 3-5 AND FIGURE 3-6. PROVIDE 90 DEGREE TAP.
(PART 3 - EXECUTION)

(END OF SECTION 23 31 13)

SECTION 23 33 00 - AIR DUCT ACCESSORIES

- PART 1 - GENERAL
1. SECTION INCLUDES
A. BACKDRAFT AND PRESSURE RELIEF DAMPERS
B. MANUAL VOLUME DAMPERS
C. TURNING VANES
D. FLEXIBLE CONNECTORS
E. DUCT ACCESSORY HARDWARE
2. SECTION REQUIREMENTS
A. SUBMITTALS: NONE REQUIRED.
PART 2 - PRODUCTS
1. COMPLY WITH NFPA 90A AND WITH NFPA 90B.
2. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS-METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, THICKNESS AND DUCT CONSTRUCTION METHODS UNLESS NOTED OTHERWISE. SHEET METAL MATERIALS SHALL BE FREE FROM PITTING, SEAM MARKS, ROLLER MARKS, STAINS, DISCOLORATIONS AND OTHER IMPERFECTIONS.
3. GALVANIZED SHEET STEEL: COMPLY WITH ASTM A 653A 653M, G90 COATING DESIGNATION.
4. BACKDRAFT AND PRESSURE RELIEF DAMPERS: GRAVITY BALANCED, AS SPECIFIED ON THE PLANS.
5. MANUAL VOLUME DAMPERS: STANDARD LEAKAGE RATING WITH LINKAGE OUTSIDE OF AIRFRAME. SUITABLE FOR HORIZONTAL OR VERTICAL APPLICATIONS
A. FRAME: HAT SHAPED WITH MITERED AND WELDED CORNERS. FLANGELESS FRAME FOR INSTALLING IN DUCTS.
B. BLADES: RECTANGULAR DAMPERS SHALL BE MULTIPLE BLADES WITH OFFSETS-BLADE DESIGN. ROUND DAMPERS SHALL BE SINGLE BLADE.
C. BLADE AXLES: GALVANIZED STEEL.
D. BEARINGS: MOLDED SYNTHETIC.
E. THE BARS AND BRACKETS: GALVANIZED STEEL.
F. JACKSHAFT: 1/2" DIAMETER CONSTRUCTED OF GALVANIZED STEEL, WITHIN PIPE BEARING ASSEMBLY WITH SUPPORTS. LENGTH AND NUMBER OF MOUNTINGS AS REQUIRED.
G. HARDWARE: ZINC-PLATED, DIE CAST CORE WITH DIAL HANDLE AND A LOCKING NUT.
6. TURNING VANES: CURVED BLADES OF GALVANIZED SHEET STEEL. PROVIDED WITH SUPPORT BARS PERPENDICULAR TO BLADE SET SUITABLE FOR DUCT MOUNTING. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," SINGLE WALL CONSTRUCTION.
7. FLEXIBLE CONNECTORS: CONSTRUCTED OF FIBRE-RETARDANT OR NONCOMBUSTIBLE FABRIC. FABRIC SHALL BE A GLASS FABRIC, DOUBLE COATED WITH NEOPRENE. COMPLY WITH UL 81 CLASS 1 FACTORY-FABRICATED WITH A FABRIC STRIP 3-1/2 INCHES WIDE ATTACHED TO TWO STRIPS OF 2-3/4 INCH THICK GALVANIZED SHEET STEEL.
PART 3 - EXECUTION
1. INSTALLATION
A. INSTALL DUCT ACCESSORIES ACCORDING TO APPLICABLE DETAILS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS METAL AND FLEXIBLE."
B. INSTALL VOLUME DAMPERS AT POINTS NOTED ON PLANS AND AS REQUIRED FOR SYSTEM BALANCING. WHERE DAMPERS ARE INSTALLED IN DUCTS WITH DUCT LINER, INSTALL DAMPERS WITH HAT CHANNELS OF SAME DEPTH AS LINER AND TERMINATE LINER WITH NOSING AT HAT CHANNEL.
C. SET DAMPERS TO FULLY OPEN POSITION BEFORE TESTING, ADJUSTING AND BALANCING.
D. INSTALL TEST HOLES AT FAN INLETS AND OUTLETS AND WHERE REQUIRED FOR TESTING AND BALANCING PURPOSES.
E. INSTALL FIRE DAMPERS ACCORDING TO UL LISTING.
F. INSTALL FLEXIBLE CONNECTORS TO CONNECT DUCTS TO EQUIPMENT.
2. TESTS AND INSPECTIONS
A. OPERATE DAMPERS TO VERIFY FULL RANGE OF MOVEMENT.
B. OPERATE FIRE DAMPERS TO VERIFY FULL RANGE OF MOVEMENT AND VERIFY THAT PROPER HEAT-RESPONSE DEVICE IS INSTALLED.
C. INSPECT TURNING VANES FOR PROPER AND SECURE INSTALLATION.
(PART 3 - EXECUTION)

(END OF SECTION 23 33 00)

SECTION 23 33 46 - FLEXIBLE DUCTS

- PART 1 - GENERAL
1. SECTION REQUIREMENTS
A. SUBMITTALS: NONE REQUIRED.
PART 2 - PRODUCTS
1. COMPLY WITH NFPA 90A AND NFPA 90B.
2. COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESS AND DUCT CONSTRUCTION METHODS UNLESS NOTED OTHERWISE.
3. COMPLY WITH ASTM F 468 F 468M.
4. INSULATED, FLEXIBLE DUCT UL 181, CLASS 1, FACTORY FABRICATED AND INSULATED. PROVIDED WITH INTERIOR LINER, FIBROUS-GLASS INSULATION AND VAPOR-BARRIER FILM.
A. PRESSURE RATING: 10" W.G. POSITIVE.
B. MAXIMUM VELOCITY: 4,000 FPM.
C. INSULATION R-VALUE: R-6.0
5. FLEXIBLE DUCT CONNECTIONS SHALL BE NYLON STRAPS IN SIZES 3 THROUGH 18 INCHES TO SUIT DUCT SIZE.
PART 3 - EXECUTION
1. INSTALLATION
A. INSTALL FLEXIBLE DUCTS ACCORDING TO APPLICABLE DETAILS IN SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
B. INSTALL IN INDOOR APPLICATIONS ONLY. FLEXIBLE DUCTWORK IS ONLY PERMITTED TO CONNECT TO SUPPLY-AIR GRILLES, REGISTERS AND DIFFUSERS. MAXIMUM LENGTH SHALL BE 60 INCHES.
C. CONNECT FLEXIBLE DUCTS TO METAL DUCTS WITH DRAW BANDS AND TAPE.
D. INSTALL DUCTS FULLY EXTENDED.
E. DO NOT BEND DUCTS AT MORE THAN 90 DEGREE SHARP CORNERS.
F. BENDS OF FLEXIBLE DUCTING SHALL NOT EXCEED A MINIMUM OF ONE DUCT DIAMETER.
G. AVOID CONTACT WITH METAL FIXTURES, WATER LINES, PIPES, ADJACENT DUCTWORK OR CONDUIT.
H. INSTALL FLEXIBLE DUCTS IN A DIRECT LINE, WITHOUT SAGS, TWISTS OR TURNS.
I. SUSPEND FLEXIBLE DUCTS WITH BANDS 1-1/2 INCHES WIDE AND SPACED A MAXIMUM OF 48 INCHES APART. PROVIDE ADDITIONAL SUPPORT AT BENDS. DUCTS MAY REST ON CEILING JOISTS OR TRUSS SUPPORTS. SPACING BETWEEN THESE ELEMENTS SHALL NOT EXCEED 48 INCHES.
(PART 3 - EXECUTION)

(END OF SECTION 23 33 46)

SECTION 23 34 02 - POWER VENTILATORS

- PART 1 - GENERAL
1. SECTION REQUIREMENTS
A. SUBMITTALS: PROVIDE SHOP DRAWINGS INDICATING THE DIMENSIONS, WEIGHTS, REQUIRED CLEARANCES, COMPONENTS, ELECTRICAL CHARACTERISTICS, CFM, STATIC PRESSURE AND FAN CURVE.
B. WARRANTY: SUBMIT A WRITTEN WARRANTY, SIGNED BY THE MANUFACTURER AGREEING TO REPAIR OR REPLACE COMPONENTS OF RUS THAT FAIL IN MATERIALS OR WORKMANSHIP WITHIN THE MANUFACTURER'S STANDARD WARRANTY PERIOD.
PART 2 - PRODUCTS
1. DESCRIPTION
A. CENTRIFUGAL ROOF EXHAUSTER, UPBLAST OR DOWNBLAST.
2. CHARACTERISTICS: PROVIDED WITH:
A. CURB: CONSTRUCTED OF GALVANIZED STEEL WITH FULLY WELDED CORNERS AND AS NOTED IN THE MECHANICAL SCHEDULES.
B. FAN: CONSTRUCTED OF 5034 ALUMINUM AND GALVANIZED STEEL, CENTRIFUGAL AND DIRECT DRIVE. FAN SHALL BEAR A PERMANENTLY ATTACHED NAMEPLATE DISPLAYING THE MODEL AND SERIAL NUMBER OF THE UNIT.
C. HOUSING: THE BASE SHALL BE CONSTRUCTED OF GALVANIZED STEEL WITH WELDED CORNERS AND SUPPORT FOR HINGING AND CLEANING AND TO PREVENT LEAKAGE INTO THE BUILDING. FAN WINDBAND SHALL BE CONSTRUCTED OF HEAVY GAUGE ALUMINUM OR GALVANIZED STEEL, SECURELY FASTENED TO THE WINDBAND WITH HORIZONTAL AND VERTICAL SUPPORTS.
D. WHEEL: CENTRIFUGAL, BACKWARD-INCLINED AND NON-OVERLOADING. WHEEL SHALL BE BALANCED IN TWO PLANES AND COMPLETED IN ACCORDANCE WITH AMCA STANDARD 204-96. WHEEL BLADES SHALL BE DESIGNED TO MINIMIZE TURBULANCE AND REDUCE NOISE. BLADES SHALL BE WELDED TO THE WHEEL INLET CONE. BALANCING WEIGHTS SHALL BE RETURNED TO THE BLADES OR WHEEL. WHEEL SHALL BE ATTACHED TO THE MOTOR SHAFT WITH TWO SET SCREWS.
E. MOTOR: 120 VOLT, PERMANENTLY LUBRICATED, RATED FOR CONTINUOUS DUTY, THERMALLY PROTECTED AND MOUNTED OUTSIDE THE AIRSTREAM. MOTOR MOUNTING PLATE SHALL BE CONSTRUCTED OF HEAVY GAUGE GALVANIZED STEEL. THE MOTOR COMPARTMENT SHALL BE COOLED BY OUTSIDE AIR. THE MOTOR COMPARTMENT SHALL BE OF A TWO-PIECE CONSTRUCTION WITH THE CAP HAVING TWO LOCKING RELEASE CLIPS.
F. ACCESSORIES: AS NOTED ON THE MECHANICAL SCHEDULES.
PART 3 - EXECUTION
1. INSTALLATION
A. ROOF CURB: INSTALL ON ROOF STRUCTURE, LEVEL, SECURE, PER STRUCTURAL DETAILS AND PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
B. UNIT SUPPORT: INSTALL UNIT LEVEL ON STRUCTURAL CURBS PER STRUCTURAL DETAILS AND PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. CONNECTIONS
A. COMPLY WITH DUCT INSTALLATION REQUIREMENTS SPECIFIED IN OTHER HVAC SECTIONS. DRAWINGS INDICATE GENERAL ARRANGEMENTS OF DUCTS.
B. INSTALL DUCTS TO TERMINATION TO TOP OF ROOF CURB. REMOVE ROOF DECKING ONLY AS REQUIRED FOR PASSAGE OF DUCTS. DO NOT CUT OUT DECKING UNDER ENTIRE ROOF CURB. CONNECT TO FANS WITH FLEXIBLE DUCT CONNECTORS.
C. WHERE INSTALLING PIPING ADJACENT TO FANS, ALLOW SPACE FOR SERVICE AND MAINTENANCE.
D. CONNECT ELECTRICAL WIRING IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
E. GROUND EQUIPMENT IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
3. FIELD QUALITY CONTROL
A. AFTER INSTALLING FANS, TEST UNITS FOR COMPLIANCE WITH REQUIREMENTS.
B. INSPECT OR AND REMOVE SHIPPING BOLTS, BLOCKS AND THE DOWN STRAPS.
C. CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATIONS.
D. TEST AND ADJUST CONTROLS AND SAFETIES. REPLACE DAMAGED AND MALFUNCTIONING CONTROLS AND EQUIPMENT.
E. OPERATIONAL TEST: AFTER ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, START UNITS TO CONFIRM PROPER MOTOR ROTATION AND UNIT OPERATION.
(PART 3 - EXECUTION)

(END OF SECTION 23 34 02)

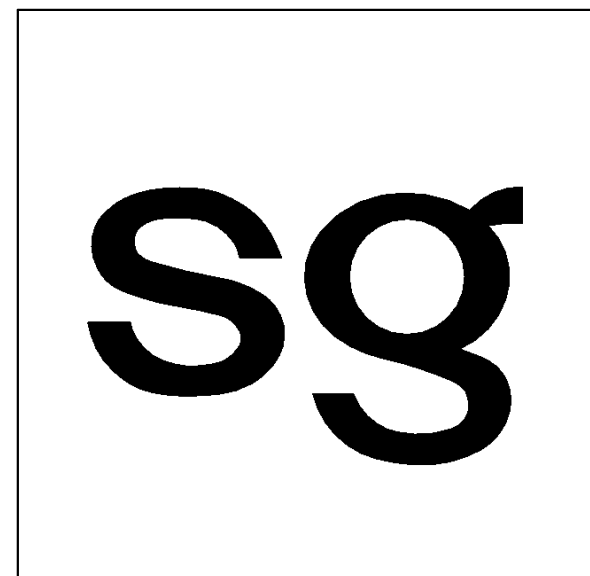
SECTION 23 34 33 - AIR CURTAINS

- PART 1 - GENERAL
1. SECTION REQUIREMENTS
A. SUBMITTALS: PROVIDE SHOP DRAWINGS INDICATING THE HEATING WATTAGE, ELECTRICAL CHARACTERISTICS, AIRFLOW CHARACTERISTICS, DIMENSIONS, WEIGHTS AND ACCESSORIES.
B. WARRANTY: PROVIDE MANUFACTURER'S WARRANTY EFFECTIVE FOR FIVE YEARS FOR UNHEATED UNITS, AND TWO YEARS FOR HEATED UNITS. THE GENERAL CONTRACTOR SHALL PROVIDE A 12 MONTH WARRANTY ON ALL WORKMANSHIP.
PART 2 - PRODUCTS
1. MANUFACTURERS: AS NOTED IN THE MECHANICAL SCHEDULES.
2. CHARACTERISTICS: PROVIDED WITH:
A. CABINET: ALUMINIZED STEEL CABINET WITH STAINLESS STEEL BIVETED CONSTRUCTION AND WHITE POWDER COATED FINISH.
B. INSTALL LEVEL, PLUMB AND AS CLOSE AS PRACTICAL TO TOP OF OPENING AND FACE OF WALL.
C. SERVICE ACCESS: REMOVABLE SCREEN AND REMOVABLE BOTTOM ACCESS PANEL.
D. MOTORS: 1/2 HP, DIRECT DRIVE, RESILIENT MOUNTED, RATED FOR CONTINUOUS DUTY WITH INTERNAL THERMAL-OVERLOAD PROTECTION AND PERMANENTLY LUBRICATED SEALED BALL BEARINGS.
E. FANS: BALANCED, FORWARD CURVED CROSS FLOW MADE OF ALUMINUM.
F. DISCHARGE NOZZLES: START UP OF HEATING, COOLING, AND VENTILATION EQUIPMENT.
G. INLET: PROVIDED WITH PERFORATED PATTERN SCREEN.
H. HEATING ELEMENTS (WHEN NOTED ON PLANS): UL-APPROVED, FACTORY-MOUNTED, FACTORY WIRED, THERMALLY PROTECTED, IN GALVANIZED STEEL FRAME. HELICAL COIL DESIGN WITH THERMAL CUTOFF.
I. PROVIDE ALL ACCESSORIES AS NOTED IN THE SCHEDULES.
3. CONTROLS:
A. MANUAL SWITCH: FACTORY INSTALLED "FAN-OFF-FAN & HEAT" AND "HIGH-LOW" SWITCHES.
B. CONTROL PACKAGE: AIR CURTAIN SHALL TURN ON WHEN DOOR IS OPENED AND SHUT OFF WHEN DOOR IS CLOSED.
PART 3 - EXECUTION
1. INSTALLATION
A. INSTALL AIR CURTAIN WHERE INDICATED ON DRAWINGS IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE CLEARANCE TO PERMIT SERVICING AND MAINTENANCE.
B. INSTALL LEVEL, PLUMB AND AS CLOSE AS PRACTICAL TO TOP OF OPENING AND FACE OF WALL.
C. INSTALL ALL ACCESSORIES.
2. CONNECTIONS
A. CONNECT ELECTRICAL WIRING IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
B. GROUND EQUIPMENT IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
3. FIELD QUALITY AND CONTROL
A. TEST AND OPERATE AIR CURTAIN TO VERIFY PERFORMANCE AS INDICATED.
4. ADJUSTING
A. ADJUST MOTOR AND FAN SPEED TO PERFORM AS INDICATED.
B. ADJUST NOZZLES TO DEFLECT AIR OUTWARD UNLESS NOTED OTHERWISE.
(PART 3 - EXECUTION)

(END OF SECTION 23 34 33)

HVAC GENERAL NOTES

- A. GENERAL NOTES APPLY TO ALL HVAC SHEETS.
B. WORK SHALL COMPLY WITH STATE AND LOCAL CODE REQUIREMENTS AS APPROVED AND AMENDED BY THE AUTHORITY HAVING JURISDICTION, INCLUDING APPLICABLE SECTIONS OF NFPA, THE MECHANICAL CODE, AND ANY INTERIM AMENDMENTS AT THE TIME OF THE PROPOSAL. PURCHASE PERMITS ASSOCIATED WITH THE WORK. OBTAIN INSPECTIONS REQUIRED BY CODE. SEE SHEET G-001 FOR THE PREVAILING CODES.
C. CONTRACTOR AND SUBCONTRACTORS SHALL REVIEW A COMPLETE SET OF THE CONSTRUCTION DOCUMENTS.
D. COORDINATE WORK WITH THE WORK OF OTHER TRADES, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND OF THE EXISTING CONDITIONS AT THE PROJECT SITE.
E. DRAWINGS FOR THE MECHANICAL WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWING SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS. REFER TO MANUFACTURER'S STANDARD INSTALLATION DRAWINGS FOR EQUIPMENT CONNECTIONS AND INSTALLATION REQUIREMENTS. PROVIDE DUCTWORK, CONNECTIONS, OFFSETS, ACCESSORIES, AND MATERIALS NECESSARY FOR A COMPLETE SYSTEM.
F. DUCT DIMENSIONS ON PLANS INDICATE DIMENSIONS OF INTERNAL FREE AREA.
G. PERFORATED CEILING DIFFUSERS SHALL BE 4-WAY UNLESS NOTED OTHERWISE.
H. COORDINATE ROOF WORK WITH THE LANDLORD AND THE OWNER'S CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION. UTILIZE THE LANDLORD'S ROOFING CONTRACTOR AT THE GENERAL CONTRACTOR'S EXPENSE WHEN REQUIRED.
I. UNLESS NOTED OTHERWISE RECTANGULAR DUCT ELBOWS SHALL BE MITERED ELBOWS WITH DOUBLE-THICKNESS TURNING VANES.
J. REPLACE AIR FILTERS WITH NEW, CLEAN MERV8 FILTERS AT TURNOVER.
K. THE TERM "FURNISH" OR "SUPPLY" MEANS SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS. THE TERM "INSTALL" DESCRIBES THE OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTING, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS. THE TERM "PROVIDE" MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.
L. A FINAL REPORT FOR THE TESTING AND ADJUSTMENTS OF ALL NEW SYSTEMS FROM ALL DISCIPLINES SHALL BE COMPLETED WITH FINAL APPROVAL BY THE FIELD INSPECTOR. THIS REPORT SHALL BE SIGNED BY THE INDIVIDUAL RESPONSIBLE FOR PERFORMING THESE SERVICES.
M. TESTING AND BALANCING OF THE MECHANICAL SYSTEMS TO BE COMPLETED BY NATIONALTAB AT THE GENERAL CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL CONTRACT WITH, SCHEDULE AND SUPERVISE/ASSIST NATIONALTAB AS REQUIRED. REFER TO THE COVER SHEET, OR CONTACT SWEETGREEN'S CONSTRUCTION MANAGER FOR CONTACT INFORMATION.
N. ALL DUCT AND OTHER RELATED AIR DISTRIBUTION COMPONENT OPENINGS SHALL BE COVERED WITH TAPE, PLASTIC, OR SHEET METAL UNTIL THE FINAL START UP OF THE HEATING, COOLING, AND VENTILATION EQUIPMENT.
O. REFER TO THE TRANE AND CAPTIVE-AIRE NATIONAL ACCOUNT INFORMATION BLOCKS ON SHEET M-300 FOR REPRESENTATIVE CONTACT INFORMATION.
P. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY UNIT CONFIGURATIONS, COORDINATE DELIVERY WITH TRANE, RECEIVE AND UNLOAD EQUIPMENT, INSPECT EQUIPMENT AND PROPERLY INSTALL EQUIPMENT INCLUDING FIELD-INSTALLED ITEMS. PROVIDE EQUIPMENT STARTUP AND 1ST YEAR LABOR WARRANTY AND ADMINISTRATION.



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CONSTRUCTION ISSUE SET

PROJECT INFORMATION: ARBOR HILLS
PROJECT INFORMATION: 3070 WASHTEENAW AVE. #107 ANN ARBOR, MI 48104
10/14/2022

Table with columns: DRAWN BY, CHECKED BY, PROJECT MANAGER, SG DESIGN MANAGER, SG CONST. MANAGER, PROJECT NO., TEMPLATE VERSION.

Table with columns: REVISIONS, REV., DATE, DESCRIPTION.

MECHANICAL SPECIFICATIONS

M-010

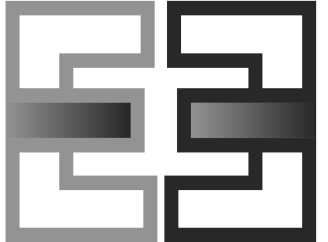


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PROJECT MANAGER: JAE
SG DESIGN MANAGER: LK
SG CONSTR. MANAGER: JB
PROJECT NO: 210013
TEMPLATE VERSION: 12/21/2021

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REV. DATE DESCRIPTION
1 08/31/2022 CLIENT REVISIONS

MECHANICAL
SPECIFICATIONS

M-011

SECTION 23 37 13 - GRILLES, REGISTERS & DIFFUSERS

PART 1 - GENERAL
1. SECTION REQUIREMENTS
A. SUBMITTALS: NONE REQUIRED.

PART 2 - PRODUCTS
1. GRILLES: MANUFACTURER, MODEL, MATERIAL, FINISH, MOUNTING AND ACCESSORIES SHALL BE AS NOTED IN THE MECHANICAL SCHEDULES. NO SUBSTITUTIONS SHALL BE PERMITTED.
2. REGISTERS: MANUFACTURER, MODEL, MATERIAL, FINISH, MOUNTING AND ACCESSORIES SHALL BE AS NOTED IN THE MECHANICAL SCHEDULES. NO SUBSTITUTIONS SHALL BE PERMITTED.
3. DIFFUSERS: MANUFACTURER, MODEL, MATERIAL, FINISH, MOUNTING AND ACCESSORIES SHALL BE AS NOTED IN THE MECHANICAL SCHEDULES. NO SUBSTITUTIONS SHALL BE PERMITTED.

PART 3 - EXECUTION
1. INSTALLATION
A. INSTALL GRILLES, REGISTERS & DIFFUSERS LEVEL AND PLUMB.
B. INSTALL GRILLES, REGISTERS & DIFFUSERS AS INDICATED. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION.
C. INSTALL GRILLES, REGISTERS & DIFFUSERS WITH AIRTIGHT CONNECTIONS TO DUCTS AND TO ALLOW SERVICE AND MAINTENANCE OF DAMPERS, EXTRACTORS AND OTHER ACCESSORIES.
D. AFTER INSTALLATION, ADJUST REGISTERS & DIFFUSERS TO AIR PATTERNS (IF NOTED) OR AS DIRECTED BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO STARTING AIR BALANCING.

(END OF SECTION 23 37 13)

SECTION 23 55 01 - COMMERCIAL CEILING HEATERS

PART 1 - GENERAL
1. SECTION REQUIREMENTS
A. SUBMITTALS: PROVIDE SHOP DRAWINGS INDICATING THE HEATING WATTAGE, ELECTRICAL CHARACTERISTICS, AIRFLOW CHARACTERISTICS, DIMENSIONS, WEIGHTS, REQUIRED CLEARANCES AND ACCESSORIES.
B. WARRANTY: SUBMIT A MANUFACTURER'S WARRANTY EFFECTIVE FOR 18 MONTHS ON THE HEATER. THE GENERAL CONTRACTOR SHALL PROVIDE A 12 MONTH WARRANTY ON ALL WORKMANSHIP.

PART 2 - PRODUCTS
1. DESCRIPTION
A. ELECTRICAL COMPONENTS, DEVICES AND ACCESSORIES SHALL BE LABELED AND LISTED AS DEFINED IN NFPA 70 BY A QUALIFIED TESTING AGENCY.
2. MANUFACTURERS: AS NOTED IN THE MECHANICAL SCHEDULES. ALTERNATES BY QMARK OR BERKO. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL STRUCTURAL, ELECTRICAL AND OTHER REQUIREMENTS RESULTING FROM THE SUBSTITUTION. ALL CHANGE ORDERS RESULTING IN THE USE OF AN ALTERNATE SHALL BE PAID FOR BY THIS CONTRACTOR.
3. CHARACTERISTICS: PROVIDED WITH:
A. HEATING ELEMENT CONSTRUCTED OF FINNED TUBULAR STEEL ELEMENTS.
B. COVERED FRONT GRILLE CONSTRUCTED OF 18-GAUGE STEEL.
C. AUTOMATIC RESET THERMAL CUTOFF AND FAN OVERRIDE.
D. FAN MOTOR SHALL BE PERMANENTLY LUBRICATED, OPEN AND VENTILATED.
E. WATTAGE, TEMPERATURE RISE, AIRFLOW AND VOLTAGE SHALL BE NOTED ON THE SCHEDULES.
F. PROVIDE ALL ACCESSORIES AS NOTED IN THE SCHEDULES.

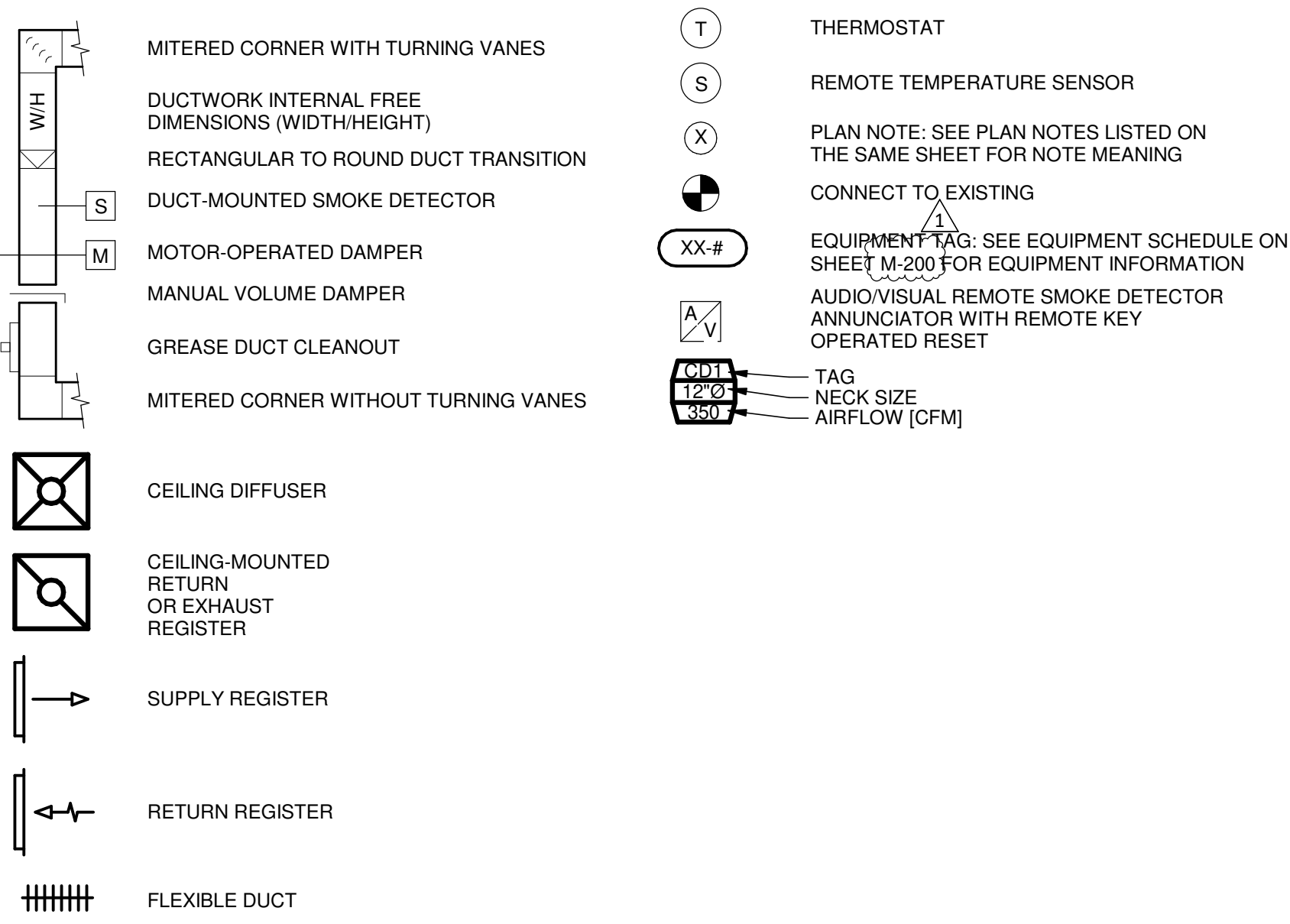
PART 3 - EXECUTION
1. INSTALLATION
A. COORDINATE INSTALLATION WITH WORK OF ALL OTHER TRADES. ACCOMMODATE HANGERS AND OTHER REQUIREMENTS AS NECESSARY.
B. INSTALL UNIT LEVEL AND PLUMB.
C. INSTALL THE UNIT IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS SO THAT THE UNIT WILL NOT FALL OR SAG. CEILING SHALL NOT DEFORM AFTER INSTALLATION OR MAINTENANCE.
2. CONNECTIONS
A. CONNECT ELECTRICAL WIRING IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
B. GROUND EQUIPMENT IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
3. FIELD QUALITY CONTROL
A. CONFIRM THERMOSTAT FUNCTION.
B. CONFIRM HEATER AND FAN FUNCTION.
C. CONFIRM ALL INTERLOCKINGS WITH OTHER MECHANICAL COMPONENTS ARE FUNCTIONAL.
D. CLEAN FRONT GRILLE PRIOR TO TURNOVER.

(END OF SECTION 23 55 01)



SYMBOLS & ABBREVIATIONS

HVAC SYMBOLS



CODED NOTES

- 1 INSTALL EQUIPMENT PER MANUFACTURER'S INSTALLATION INSTRUCTIONS AND PER THE STRUCTURAL DETAILS.
- 2 COORDINATE MOUNTING LOCATION FOR WALK-IN COOLER CONDENSING UNIT, CU-1 ON THE ROOF WITH THE KITCHEN EQUIPMENT SUPPLIER PRIOR TO ROUGH-IN. ENSURE ALL CLEARANCE REQUIREMENTS FOR THE UNIT ARE MAINTAINED. INSTALL THE KITCHEN EQUIPMENT SUPPLIER FURNISHED UNIT IN LOCATION SHOWN AND PER THE REQUIREMENTS OF THE STRUCTURAL DRAWINGS AND THE MANUFACTURER'S REQUIREMENTS. KITCHEN EQUIPMENT SUPPLIER SHALL PROVIDE LINESET, SPECIALTIES AND MAKE ALL FINAL CONNECTIONS BETWEEN THE CONDENSING UNIT AND EVAPORATOR COIL.
- 3 PROVIDE SUPPLY DIFFUSER CONNECTION PER DETAIL 1/SHEET M-400.
- 4 REFER TO THE ARCHITECTURAL RCP FOR CEILING MOUNTED EQUIPMENT LOCATION, TYPICAL.
- 5 PROVIDE AUDIO VISUAL REMOTE SMOKE DETECTOR ANNUNCIATOR WITH REMOTE KEY OPERATED RESET. WIRE A UNIT BACK TO EACH SMOKE DETECTOR. MOUNT UNIT 60" AFF. TYPICAL.
- 6 PROVIDE "LIGHTSTAT" THERMOSTATS WITH LOCKABLE COVERS (HONEYWELL CG512A) FOR RTU-1 AND RTU-2 AT THIS LOCATION AT 48" AFF. COORDINATE WITH ELECTRICAL SWITCHING IN THE AREA AND EXTEND WIRING TO REMOTE TEMPERATURE SENSOR AND UNITS. LABEL EACH THERMOSTAT ACCORDINGLY. COORDINATE THERMOSTAT LOCATION WITH WALL-MOUNTED EQUIPMENT SO THAT THE THERMOSTATS ARE NOT BLOCKED BY SHELVEING, COAT RACKS OR DOORS.
- 7 INSTALL THE TEMPERATURE SENSOR FOR THE HVAC EQUIPMENT NOTED AT THIS LOCATION AT 5'-0" AFF. COORDINATION LOCATION WITH EQUIPMENT AND WALL-MOUNTED FIXTURES AS REQUIRED SUCH THAT THE SENSOR IS NOT BLOCKED.
- 8 PROVIDE EXPOSED DUCTWORK AS SHOWN, PER THE SPECIFICATIONS AND PER DETAIL 2/SHEET M-400.
- 9 THE GENERAL CONTRACTOR SHALL FURNISH A REME HALO AIR PURIFICATION SYSTEM AND REQUIRED TRANSFORMER, PURCHASED THROUGH SWEETGREEN'S VENDOR (NATIONAL TAB) AND INSTALL SYSTEM IN THE SUPPLY AIR PLENUM OF THE ROOFTOP UNIT PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. ADJUST AS REQUIRED FOR THE SUPPLY AIRFLOW.
- 10 THE GENERAL CONTRACTOR SHALL PROVIDE A DUCT-MOUNTED SMOKE DETECTOR IN THE RETURN AIR STREAM UPON DETECTION OF SMOKE. THE SUPPLY AIR FAN SHALL DE-ENERGIZE. COORDINATE ALL REQUIREMENTS WITH THE LANDLORD AND ALARM PROVIDER. PROVIDE TAG ON LAY-IN CEILING INDICATING THE LOCATION OF THE SMOKE DETECTOR ABOVE.
- 11 MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCE ZONES. NO DUCTWORK, PIPING, CONDUIT OR OTHER SYSTEMS SHALL BE PERMITTED IN THIS AREA. COORDINATE WITH SITE CONDITIONS AND WORK OF OTHER TRADES AS REQUIRED. TYPICAL.
- 12 INSTALL THE TYPE II HOOD, HD-2 IN LOCATION SHOWN. SUPPORT PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. INSTALL HOOD ACCORDING TO THE REQUIREMENTS OF ITS LISTING, THE BUILDING CODE, ALL NFPA REQUIREMENTS AND THE LOCAL AUTHORITY HAVING JURISDICTIONS REQUIREMENTS.
- 13 NOT USED.
- 14 PROVIDE HEATER RECESSED IN THE CEILING, INTERLOCKED WITH RTU-2 SO THAT THE HEATING SHALL NOT BE ENERGIZED WHEN RTU-2 IS CALLING FOR COOLING.
- 15 EXISTING PACKAGED ROOFTOP UNIT TO REMAIN. THE GENERAL CONTRACTOR SHALL CLEAN THE EXTERIOR CABINET, INTERIOR PLENUMS, CHEMICALLY CLEAN COILS, STRAIGHTEN BENT CONDENSER FINS, PROVIDE ADDITIONAL REFRIGERANT CHARGE AS REQUIRED AND VERIFY HEAT FUNCTION. REPAIR/REPLACE FAN BELTS, BALANCE FAN BLADES AS NECESSARY, GREASE BEARINGS AND VERIFY MOTOR FUNCTION/ROTATION. REPLACE EXISTING AIR FILTERS AT START OF CONSTRUCTION AND IMMEDIATELY PRIOR TO AIR BALANCE. REPAIR/REPLACE ALL DEFECTIVE PARTS AS REQUIRED TO RETURN THE UNIT TO WORKING ORDER. REBALANCE OUTSIDE AIR VENTILATION RATE TO VALUES NOTED IN THE SCHEDULES.
- 16 EXISTING PACKAGED ROOFTOP UNIT TO REMAIN. MAKE ALL CONNECTIONS AS REQUIRED.

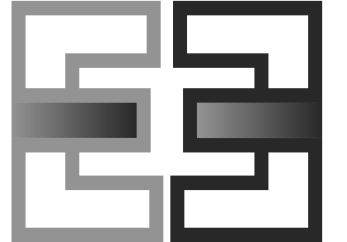


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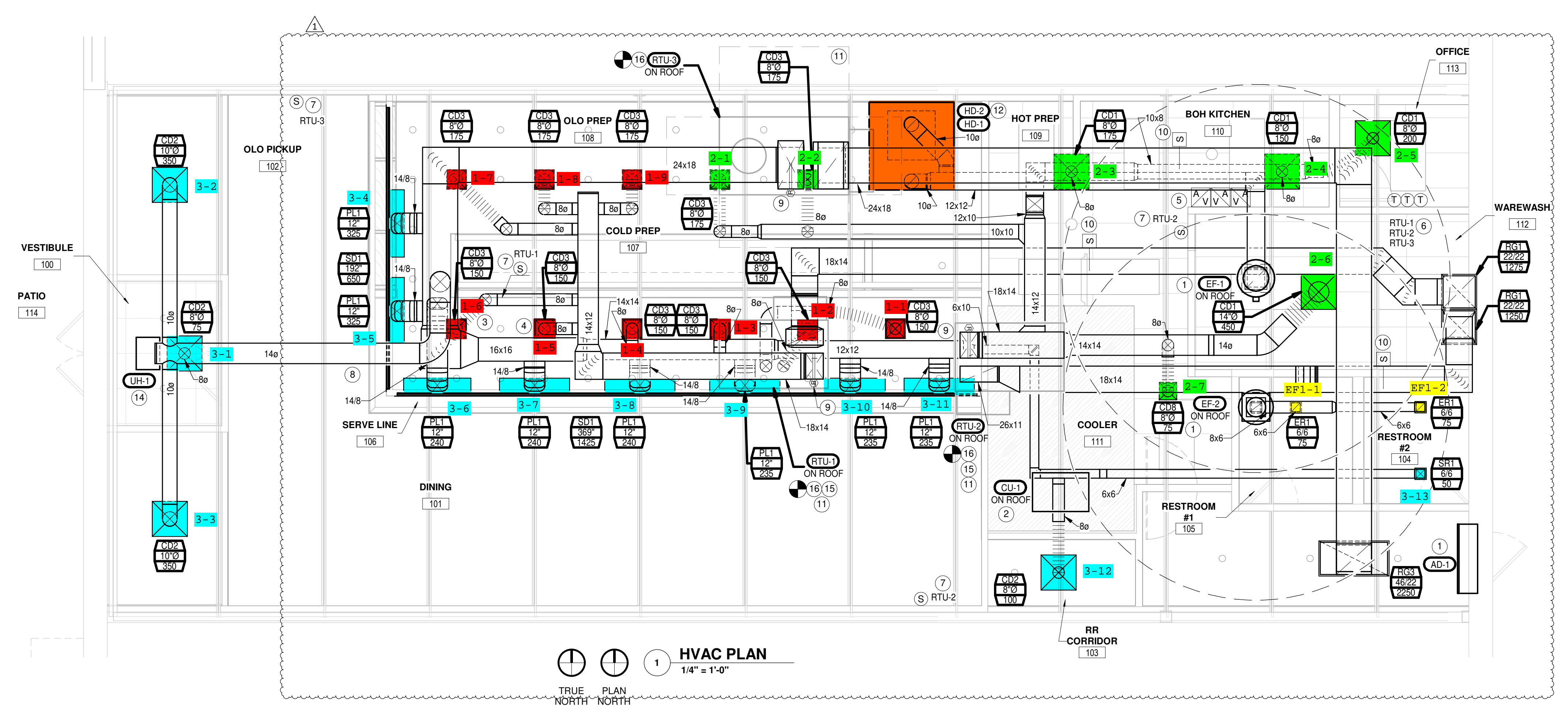
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SG DESIGN MANAGER: LK
SG CONSTR. MANAGER: JB
PROJECT NO: 210013
TEMPLATE VERSION: 12/21/2021

REVISIONS
REV. DATE DESCRIPTION
1. 08/31/2022 CLIENT REVISIONS

HVAC PLAN

M-100



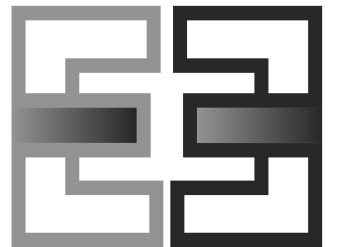


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HVAC SCHEDULES

M-200

MATERIAL SCHEDULE		
CATEGORY	APPLICATION	ALLOWABLE MATERIAL
DUCT	EXPOSED, SUPPLY	DOUBLE-WALL, INSULATED ROUND AS SHOWN. PAINTED TO MATCH ROOF DECK.
	CONCEALED, SUPPLY	RECTANGULAR OR ROUND AS SHOWN. INSULATED.
	CONCEALED, RETURN	RECTANGULAR OR ROUND AS SHOWN. INSULATED.
	CONCEALED, GEN. EXHAUST	RECTANGULAR OR ROUND AS SHOWN. INSULATED.
PIPING	CONDENSATE DRAINS	SCHEDULE 40 PVC PIPE AND FITTINGS.

AIR BALANCE SCHEDULE					
TAG	SUPPLY AIRFLOW (CFM)	RETURN AIRFLOW (CFM)	OUTSIDE AIRFLOW (CFM)	EXHAUST AIRFLOW (CFM)	SUBTOTAL (CFM)
EF-1	0	0	0	705	-705
EF-2	0	0	0	150	-150
RTU-1	1425	1275	150	0	150
RTU-2	1400	1250	150	0	150
RTU-3	3000	2250	750	0	750
NET PRESSURIZATION (CFM)					195

EXHAUST SCHEDULE							
PER TABLE 403.3.1.1 OF THE 2015 MICHIGAN MECHANICAL CODE							
CATEGORY	AREA (SF)	NUMBER OF FIXTURES	AIR RATE		EXHAUST REQUIRED (CFM)		EXHAUST PROVIDED (CFM)
			CFM / FIXTURE	CFM / SF	FIXTURES	FLOOR AREA	
KITCHEN	1003.4	0	0.00	-0.70	0.0	-702.4	-705.0
RESTROOMS	98.2	2	-50.00	0.00	-100.0	0.0	-150.0
TOTAL						-802.4	-855.0

VENTILATION SCHEDULE										
PER TABLE 403.3.1.1 OF THE 2015 MICHIGAN MECHANICAL CODE										
CATEGORY	OCCUPANT DENSITY (# / 1000 SF)	AREA (SF)	OCCUPANCY BY AREA (PEOPLE)	AIR RATE (CFM)		VENTILATION REQUIRED (CFM)			VENTILATION PROVIDED (CFM)	VENTILATION PROVIDED (CFM)
				CFM / PERSON	CFM / SF	OCCUPANCY	FLOOR AREA	EFFECTIVENESS		
CORRIDOR	0	152.7	0	0.00	0.06	0.0	9.2	0.8	11.5	15.0
DINING ROOM	70	756.3	53	7.50	0.18	397.5	136.1	0.8	667.0	735.0
OFFICE	5	43.8	1	5.00	0.06	5.0	2.6	0.8	9.5	21.4
TOTAL									688.0	771.4

GRILLS, REGISTERS, AND DIFFUSERS SCHEDULE											
TAG	DESCRIPTION	FACE SIZE	MATERIAL	FINISH	MOUNTING	SUPPLIER	INSTALLER	MANUFACTURER	MODEL	REMARKS	
CD1	PERFORATED CEILING DIFFUSER	24" x 24"	ALUMINUM	WHITE	LAY-IN	GC	GC	TITUS	PCS-AA	PROVIDE INTEGRAL OBD	
CD2	PLAQUE FACE DIFFUSER	24" x 24"	ALUMINUM	WHITE	GYPSUM BOARD	GC	GC	TITUS	OMNI-AA	PROVIDE WITH INTEGRAL OBD	
CD3	PERFORATED CEILING DIFFUSER	12" x 12"	ALUMINUM	WHITE	GYPSUM BOARD	GC	GC	TITUS	PCS-AA	PROVIDE INTEGRAL OBD	
CD8	PERFORATED CEILING DIFFUSER	12" x 12"	ALUMINUM	WHITE	LAY-IN	GC	GC	TITUS	PCS-AA	PROVIDE INTEGRAL OBD	
ER1	0" FIXED BLADE EXHAUST GRILL	8" x 8"	ALUMINUM	WHITE	GYPSUM BOARD	GC	GC	TITUS	355ZFL	PROVIDE INTEGRAL OBD	
PL1	SLOT DIFFUSER PLENUM	HEIGHT=1" LENGTH=48" INLET=12"	STEEL	MILL	FIXTURE	GC	GC	TITUS	FBPI-10	FURNISH WITH FACE-OPERATED INLET DAMPER	
RG1	PERFORATED CEILING RETURN	24" x 24"	ALUMINUM	WHITE	LAY-IN	GC	GC	TITUS	PAR-AA		
RG3	PERFORATED CEILING RETURN	48" x 24"	ALUMINUM	WHITE	GYPSUM BOARD	GC	GC	TITUS	PAR-AA		
SD1	LINEAR SLOT DIFFUSER	HEIGHT = 1" REFER TO PLANS FOR LENGTH	ALUMINUM	WHITE	GYPSUM BOARD	GC	GC	TITUS	FL-10 JET THROW	FURNISHED WITH BORDER TYPE 22 AND MOUNTING CLIPS. PROVIDE BLOCK OFF PLATE WHERE NO PLENUM SHOWN	
SR1	DOUBLE DIRECTIONAL SUPPLY REGISTER	8" x 8"	STEEL	WHITE	SURFACE	GC	GC	TITUS	300FL	PROVIDE INTEGRAL OBD	

UNIT HEATER SCHEDULE											
TAG	DESCRIPTION	AIRFLOW (CFM)	TEMPERATURE RISE (°F)	WEIGHT (LB)	ELECTRICAL		SUPPLIER	INSTALLER	MANUFACTURER	MODEL	REMARKS
					WATTS	V/P/H					
UH-1	CEILING UNIT HEATER	160 CFM	45	30	2,250	208/1/60	GC	GC	INDEECO	931U03000V	PROVIDED WITH DISCONNECT SWITCH, CONTROL RELAY, BUILT-IN TAMPERPROOF THERMOSTAT AND FRONT GRILLE.

RECIRCULATING HOOD SCHEDULE											
TAG	DESCRIPTION	MAX COOKING TEMP.	EXHAUST PLENUM AIRFLOW (CFM)	APPROXIMATE WEIGHT (LB)	SUPPLIER	INSTALLER	ELECTRICAL		MANUFACTURER	MODEL	REMARKS
							WATTS	V/P/H			
HD-1	VENTLESS CANOPY RECIRCULATING HOOD	N/A	415	175	OWNER	OWNER	170 W	120/1/60	RATIONAL	60.76.177	

FAN SCHEDULE											
TAG	EXHAUST AIRFLOW (CFM)	E.S.P. (IN. W.C.)	DRIVE TYPE	MOTOR POWER (HP)	WEIGHT (LB)	V/P/H	SUPPLIER	INSTALLER	MANUFACTURER	MODEL	SPECIAL REMARKS
EF-1	705	0.8	DIRECT	0.33	100	120/1/60	GC	GC	CAPTIVEAIRE	DU33HFA	FURNISHED WITH DISCONNECT, SPEED CONTROLLER, BACKDRAFT DAMPER AND 24" TALL ROOF CURB.
EF-2	150	0.6	DIRECT	0.25	100	120/1/60	GC	GC	CAPTIVEAIRE	DR12HFA	FURNISHED WITH DISCONNECT, SPEED CONTROLLER, BACKDRAFT DAMPER AND 24" TALL ROOF CURB.

TYPE II HOOD SCHEDULE														
TAG	DESCRIPTION	HOOD CONSTRUCTION			MAXIMUM COOKING TEMPERATURE (DEG. F)	EXHAUST COLLARS			WEIGHT (LB)	SUPPLIER	INSTALLER	MANUFACTURER	MODEL	REMARKS
		WIDTH	DEPTH	MATERIAL		AIRFLOW (CFM)	DIAMETER (IN)	PRESSURE DROP (IN. W.G.)						
HD-2	TYPE II CANOPY HOOD	58"	60"	430 STAINLESS STEEL	700	705	10"	0.09	200	GC	GC	CAPTIVEAIRE	6012 VHB	

CONDENSING UNIT SCHEDULE													
TAG	DESCRIPTION	PAIRED WITH	NUMBER OF COMPRESSORS	REFRIGERANT TYPE	WEIGHT (LB)	ELECTRICAL			SUPPLIER	INSTALLER	MANUFACTURER	MODEL	REMARKS
						MOCP	FLA	V/P/H					
CU-1	WALK-IN COOLER REMOTE CONDENSING UNIT	N/A	1	R448A	260	25	16.3	208/1/60	KES	KES	BY KES	BY KES	FURNISHED WITH THE WALK-IN COOLER.

ROOFTOP UNIT SCHEDULE																										
TAG	DESCRIPTION	COOLING CAPACITY (TONS)	EER (SEER)	AIRFLOW				COOLING				HEATING				ELECTRICAL						REMARKS				
				TOTAL (CFM)	RETURN (CFM)	OA (CFM)	E.S.P. (IN. W.C.)	NET TOTAL (MBH)	NET SENSIBLE (MBH)	DB	WB	INPUT (BTU/H)	OUTPUT (BTU/H)	EAT (DEG. F)	NUMBER OF COMPRESSORS	NUMBER OF CIRCUITS	REFRIGERANT CHARGE (LB)	WEIGHT (LB)	MOCP (A)	MCA (A)	V/P/H		SUPPLIER	INSTALLER	MANUFACTURER	MODEL
RTU-1	DINING ROOM ROOFTOP UNIT	4.0	13	1425	1275	150	0.8	43.6	26.3	74.0	65.5	72,000	59,000	62.7	1	1	11.0	1100	40	28.0	208/3/60	EXISTING	EXISTING	CARRIER	48TC005	EXISTING UNIT WITH ENTHALPY ECONOMIZER, POWERED EXHAUST AND ALL OTHER ACCESSORIES TO REMAIN.
RTU-2	DINING ROOM ROOFTOP UNIT	4.0	13	1400	1250	150	0.8	43.6	26.3	74.0	65.5	72,000	59,000	62.7	1	1	11.0	1100	40	28.0	208/3/60	EXISTING	EXISTING	CARRIER	48TC005	EXISTING UNIT WITH ENTHALPY ECONOMIZER, POWERED EXHAUST AND ALL OTHER ACCESSORIES TO REMAIN.
RTU-3	KITCHEN ROOFTOP UNIT	7.5	12.5	3000	2250	750	0.8	90.3	63.2	77.3	66.4	200,000	160,000	52.5	2	2	7.4	1200	50	39.0	208/3/60	LANDLORD	LANDLORD	TRANE	YSC092	LANDLORD PROVIDED UNIT WITH DRY BULB ECONOMIZER WITH BAROMETRIC RELIEF. FIELD-VERIFY ALL ACCESSORIES.

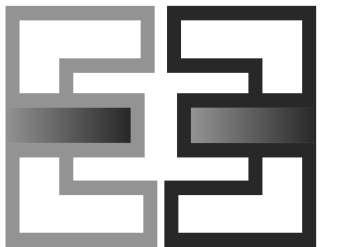


sweetgreen

3101 W. EXPOSITION BLVD.
LOS ANGELES, CALIFORNIA 90018

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CONSTRUCTION
ISSUE SET

10/14/2022

PROJECT INFORMATION:
ARBOR HILLS

PROJECT INFORMATION:
**3070 WASHTEENAW AVE. #107
ANN ARBOR, MI 48104**

DRAWN BY: JAE
CHECKED BY: MK
PROJECT MANAGER: JAE
SG DESIGN MANAGER: LK
SG CONSTR. MANAGER: JB
PROJECT NO: 210013
TEMPLATE VERSION: 12/21/2021

REVISIONS
REV. DATE DESCRIPTION
1 08/31/2022 CLIENT REVISIONS

HVAC DETAILS

M-400

**SEQUENCE OF OPERATIONS
RTU-1 & RTU-2**

OCCUPIED MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: WHEN SCHEDULED BY THE THERMOSTAT TO BE IN OCCUPIED MODE, THE ROOFTOP UNIT FANS ARE TO START AND RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL MODULATE TO THE MINIMUM POSITION.
HEATING: ON A FALL IN SPACE TEMPERATURE BELOW THE SETPOINT OF 70 DEGREES (ADJUSTABLE) THE HEATING SHALL BE ENERGIZED TO MAINTAIN THE SETPOINT.
COOLING: ON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 72 DEGREES (ADJUSTABLE), WHEN THE ENTHALPY OF THE OUTSIDE AIR IS FAVORABLE, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN UP TO 100% TO PROVIDE COOLING FOR THE SPACE. WHEN THE ENTHALPY OF THE OUTSIDE AIR IS NOT FAVORABLE, OR THERE IS A SUDDEN DEMAND FOR SPACE COOLING, THE OUTSIDE AIR DAMPER SHALL MODULATE TO THE MINIMUM POSITION AND THE COOLING SHALL BE ENERGIZED AS REQUIRED TO MAINTAIN THE SETPOINT.

UNOCCUPIED MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: WHEN SCHEDULED BY THE THERMOSTAT TO BE IN UNOCCUPIED MODE, THE ROOFTOP UNIT FANS ARE TO BE OFF AND THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.

HEATING: ON A FALL IN SPACE TEMPERATURE BELOW THE SETPOINT OF 55 DEGREES (ADJUSTABLE) THE ROOFTOP UNIT FAN SHALL START AND THE HEATING SHALL BE ENERGIZED TO MAINTAIN THE SETPOINT.

COOLING: ON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 85 DEGREES (ADJUSTABLE) THE ROOFTOP UNIT FAN SHALL START. WHEN THE ENTHALPY OF THE OUTSIDE AIR IS FAVORABLE, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN UP TO 100% TO PROVIDE COOLING FOR THE SPACE. WHEN THE ENTHALPY OF THE OUTSIDE AIR IS NOT FAVORABLE, OR THERE IS A SUDDEN DEMAND FOR SPACE COOLING, THE OUTSIDE AIR DAMPER SHALL REMAIN IN THE CLOSED POSITION AND THE COOLING SHALL BE ENERGIZED AS REQUIRED TO MAINTAIN THE SETPOINT.

EMERGENCY MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: UPON A SIGNAL FROM THE FIRE ALARM SYSTEM, THE FAN SHALL STOP AND THE OUTSIDE AIR DAMPER SHALL CLOSE.

**SEQUENCE OF OPERATIONS
RTU-3**

OCCUPIED MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: WHEN SCHEDULED BY THE THERMOSTAT TO BE IN OCCUPIED MODE, THE ROOFTOP UNIT FANS ARE TO START AND RUN CONTINUOUSLY AND THE OUTSIDE AIR DAMPER SHALL MODULATE TO THE MINIMUM POSITION.
HEATING: ON A FALL IN SPACE TEMPERATURE BELOW THE SETPOINT OF 70 DEGREES (ADJUSTABLE) THE FIRST STAGE OF HEATING SHALL BE ENERGIZED TO MAINTAIN THE SETPOINT. UPON A CONTINUED FALL IN SPACE TEMPERATURE, THE SECOND STAGE SHALL BE ENERGIZED TO MAINTAIN THE SETPOINT.
COOLING: ON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 72 DEGREES (ADJUSTABLE), WHEN THE TEMPERATURE OF THE OUTSIDE AIR IS FAVORABLE, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN UP TO 100% TO PROVIDE COOLING FOR THE SPACE. WHEN THE TEMPERATURE OF THE OUTSIDE AIR IS NOT FAVORABLE, OR THERE IS A SUDDEN DEMAND FOR SPACE COOLING, THE OUTSIDE AIR DAMPER SHALL MODULATE TO THE MINIMUM POSITION AND THE COOLING SHALL BE ENERGIZED AS REQUIRED TO MAINTAIN THE SETPOINT.

UNOCCUPIED MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: WHEN SCHEDULED BY THE THERMOSTAT TO BE IN UNOCCUPIED MODE, THE ROOFTOP UNIT FANS ARE TO BE OFF AND THE OUTSIDE AIR DAMPER SHALL REMAIN CLOSED.

HEATING: ON A FALL IN SPACE TEMPERATURE BELOW THE SETPOINT OF 55 DEGREES (ADJUSTABLE) THE ROOFTOP UNIT FAN SHALL START AND THE FIRST STAGE OF HEATING SHALL BE ENERGIZED TO MAINTAIN THE SETPOINT. UPON A CONTINUED FALL IN SPACE TEMPERATURE, THE SECOND STAGE SHALL BE ENERGIZED TO MAINTAIN THE SETPOINT.

COOLING: ON A RISE IN SPACE TEMPERATURE ABOVE THE SETPOINT OF 85 DEGREES (ADJUSTABLE) THE ROOFTOP UNIT FAN SHALL START. WHEN THE ENTHALPY OF THE OUTSIDE AIR IS FAVORABLE, THE OUTSIDE AIR DAMPER SHALL MODULATE OPEN UP TO 100% TO PROVIDE COOLING FOR THE SPACE. WHEN THE ENTHALPY OF THE OUTSIDE AIR IS NOT FAVORABLE, OR THERE IS A SUDDEN DEMAND FOR SPACE COOLING, THE OUTSIDE AIR DAMPER SHALL REMAIN IN THE CLOSED POSITION AND THE COOLING SHALL BE ENERGIZED AS REQUIRED TO MAINTAIN THE SETPOINT.

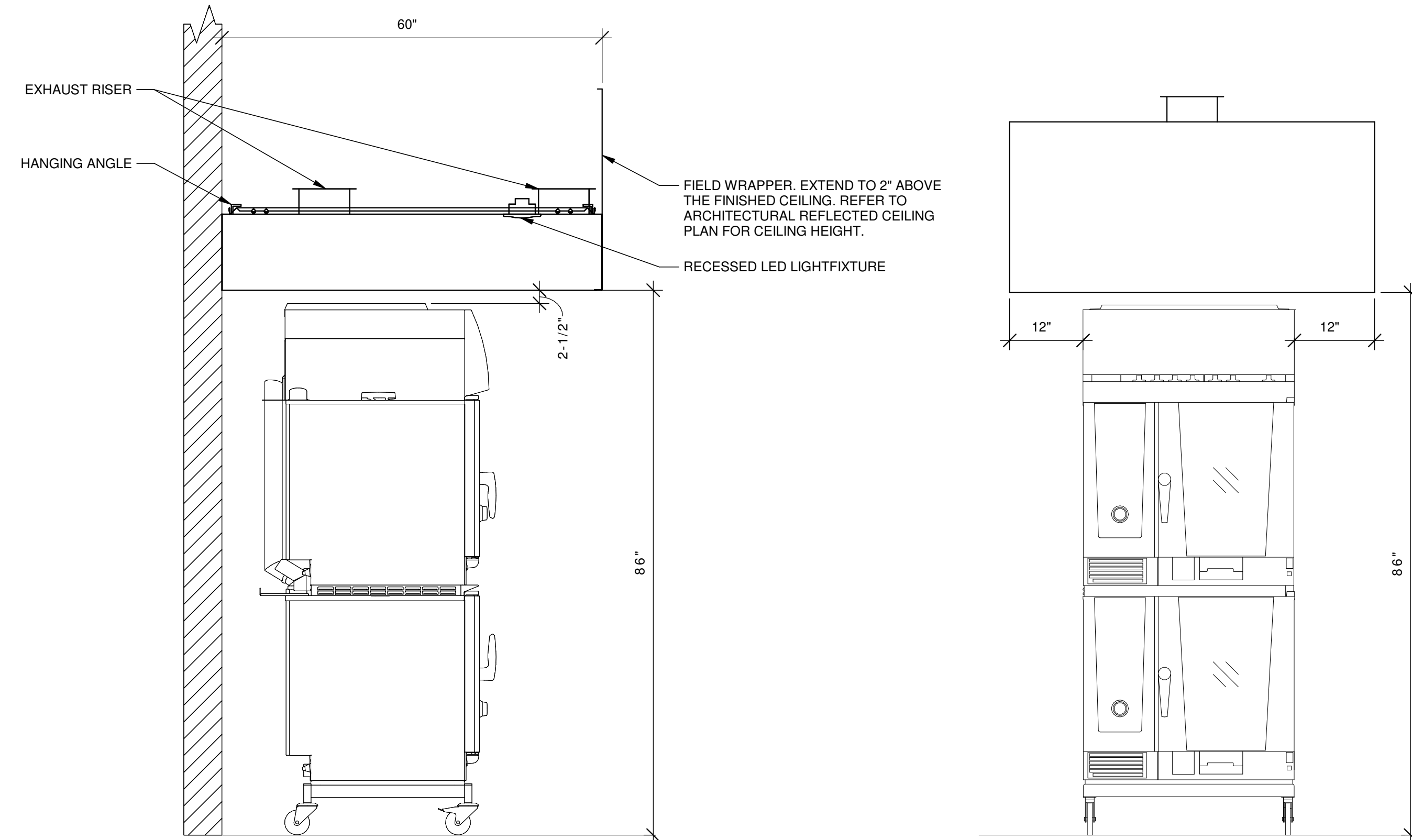
EMERGENCY MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: UPON A SIGNAL FROM THE FIRE ALARM SYSTEM, THE FAN SHALL STOP AND THE OUTSIDE AIR DAMPER SHALL CLOSE.

**SEQUENCE OF OPERATIONS
EF-1 & EF-2**

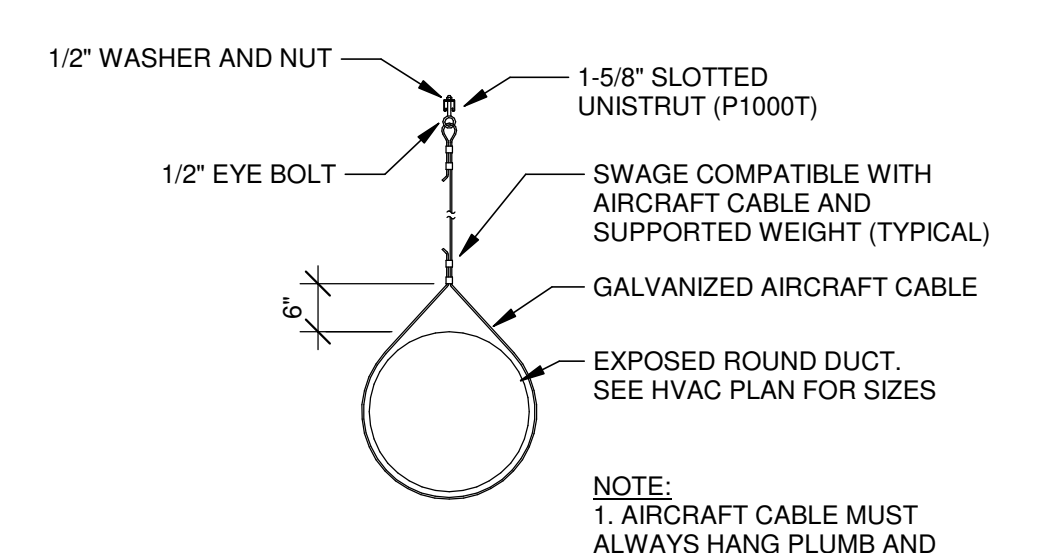
OCCUPIED MODE:
FAN OPERATION: WHEN SCHEDULED BY THE TIME CLOCK TO BE IN OCCUPIED MODE, THE EXHAUST FAN IS TO START AND RUN CONTINUOUSLY.

UNOCCUPIED MODE:
FAN OPERATION: WHEN SCHEDULED BY THE TIME CLOCK TO BE IN UNOCCUPIED MODE, THE EXHAUST FAN SHALL REMAIN OFF.

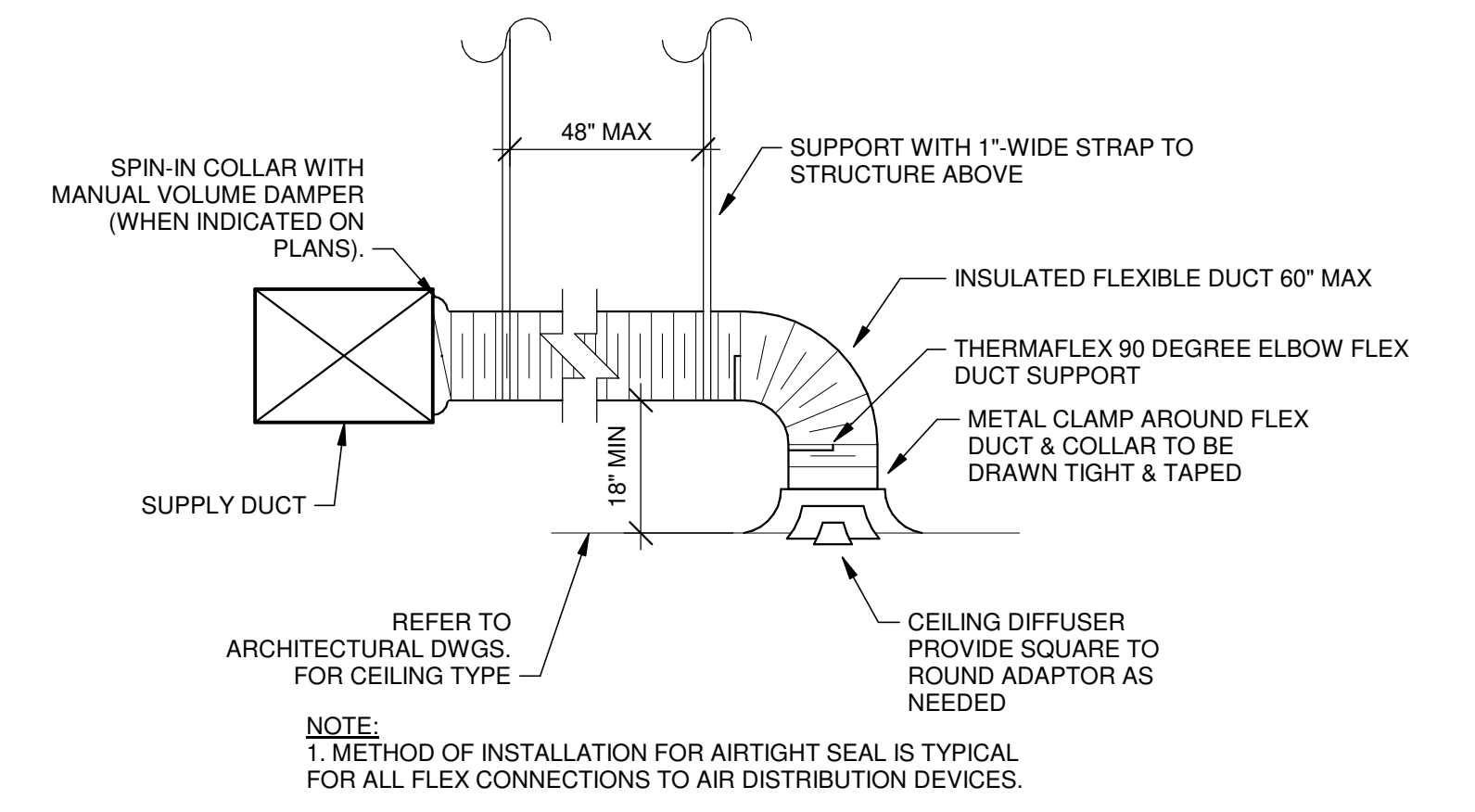
EMERGENCY MODE:
FAN OPERATION/OUTSIDE AIR DAMPER: UPON A SIGNAL FROM THE FIRE ALARM SYSTEM, THE FAN SHALL STOP.



4 HOOD ELEVATIONS
N.T.S.



2 EXPOSED DUCTWORK SUPPORT
N.T.S.



1 DIFFUSER CONNECTION
N.T.S.

3 SEQUENCE OF OPERATIONS
N.T.S.