MECHANICAL NOTES

1. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE INSTALLATION OF A COMPLETE SYSTEM IN ACCORDANCE WITH THESE DRAWINGS, THE FLORIDA BUILDING CODE 2014 AND ALL OTHER APPLICABLE STATE, COUNTY AND LOCAL ORDINANCES AND THE LATEST ADDITION OF THE FOLLOWING PUBLICATIONS; SMACNA–85, 92, 95; ASHRAE 15–01, 34–01, 62–01; NFPA 70–02, 72–02, 90A–02, 90B–02, 91–99, 96–01; ANSI Z10.1–98, Z10.3–98, Z21.8–94, Z21.83–98.
2. THE CONTRACTOR SHALL PAY ALL COSTS OF PERMIT, INSPECTIONS AND ALL OTHER COSTS INCIDENTAL TO THE COMPLETION AND TESTING OF THIS WORK.
3. THE CONTRACTOR SHALL VISIT THE SITE AND COORDINATE WORK WITH OTHER TRADES.
4. THE CONTRACTOR SHALL SUPPLY THE ARCHITECT WITH "AS–BUILT" DRAWINGS.
5. CONTRACTOR SHALL SUBMIT, FOR APPROVAL SIX [6] COPIES OF MANUFACTURER'S DRAWINGS FOR EACH PIECE OF EQUIPMENT AND CONTROLS INCLUDED IN CONTRACT.
6. ALL MATERIAL SHALL BE NEW OF U.S. MANUFACTURER OF GOOD QUALITY. ALL WORK SHALL BE PERFORMED AT INDUSTRY STANDARD QUALITY LEVEL BY CERTIFIED PROFESSIONALS. ALL EQUIPMENT SHALL BE UL OR ETL LISTED.
7. DUCTWORK:
   AA. ALL AIR CONDITIONING DUCT WORK SHALL BE OF 1" (R–4.2) SPECIAL DUTY FSK FOIL REINFORCED FIBERGLASS WITH MANUFACTURER'S LOGO PRINTED ON VAPOR BARRIER, WITH A HIGH–TENSILE, RESISTANT MAT COATING, EQUAL TO "SUPERDUCT" BY MANVILLE OR "TOUGHGARD" BY CERTAINTEED, AND ANTI–MICROBIAL PROPERTIES.
   ALL FLEXIBLE DUCT TO BE R–4.2 WITH A MAX. TOTAL LENGTH NOT TO EXCEED 15 FT. INSTALL UL LISTED FOR PLENUM, FLEXIBLE DUCTWORK ELBOW SUPPORTS AT EACH DIFFUSER, GRILLE, AND REGISTER EQUAL TO "FLEXFLOW ELBOW" AS MANUFACTURED BY "THERMAFLEX".
8. ALL EXHAUST DUCTS AND OUTSIDE AIR DUCTS SHALL BE GALVANIZED SHEET METAL WITH SEALED SEAMS AND JOINTS. ALL OUTSIDE AIR DUCT SHALL BE INSULATED WITH EXTERNAL BLANKET INSULATION R–6 MIN.
   ALL METAL EXHAUST, MAKE–UP OR OTHERWISE DUCTS INSTALLED IN LOCATIONS WHERE DEWPOINT CONDITIONS CAN OCCUR INSIDE THE DUCT SHALL BE EXTERNALLY INSULATED WITH R–6 MIN.
9. OUTSIDE AIR INTAKES SHALL BE SCREENED WITH A CORROSION RESISTANT MATERIAL NOT LARGER THAN 1/2" MESH. O/A INTAKES SHALL NOT BE TAKEN FROM A LOCATION CLOSER THAN 10 FT. FROM ANY CHIMNEY, VENT OUTLET OR SANITARY SEWER VENT OUTLET, UNLESS SUCH VENT IS NOT LESS THAN 24 INCHES ABOVE THE OUTSIDE AIR VENT.
10. DUCT SIZES SHOWN ARE INSIDE DIMENSIONS.
11. ALL AIR DEVICES (DIFFUSERS, REGISTERS AND GRILLES) SHALL BE ALL ALUMINUM CONSTRUCTION WITH EXPOSED SURFACE OFF WHITE BAKED ENAMEL FINISH OR AS SPECIFIED BY ARCHITECT. DEVICES SHALL BE AS SPECIFIED OR EQUAL TO TITUS OR METALAIRE. PROVIDE OPPOSED BLADE DAMPERS AT ALL DIFFUSERS AND REGISTERS AS INDICATED ON PLANS. PROVIDE BALANCING DAMPERS FOR ALL AIR DEVICES TO ENSURE COMPLIANCE WITH FMC 2014, PAR. 601.4 AND PAR. 603.15 FOR BALANCED AIR FLOW.
12. THERMOSTAT/HUMIDISTAT
    A. FOR NEW UNITS: SHALL BE COMBINATION COOLING/HEATING/RELATIVE HUMIDITY, WITH SYSTEM "COOL–AUTO–HEAT–OFF" AND FAN "ON–AUTO" SELECTOR SWITCHES. PROVIDE PROGRAMMABLE TYPE AS RECOMMENDED BY MANUFACTURER, HONEYWELL OR EQUAL. PROVIDE TAMPER PROOF COVERS.
    B. FOR EXISTING UNITS: SHALL BE SERVICED AND RELOCATED AS SHOWN. IF NEW THERMOSTAT IS PROVIDED IT SHALL MATCH BUILDING STANDARDS.
    C. FOR VAV BOXES: CONTROLS TO BE DDC, PROVIDE ROOM THERMOSTAT/SENSOR WITH OVERRIDE
13. BRAZING–JOINT TYPE FITTINGS, USE BRAZING MATERIALS FOR HIGH PRESSURE PIPING PER AWS A5.8: BCuP SERIES COPPER–PHOSPHORUS ALLOY OR BAg1 SILVER ALLOY. REFRIGERANT LINES SHALL BE SIZED PER MANUFACTURER'S RECOMMENDATIONS. SOFT COPPER TYPE "K" SHALL BE ALLOWED FOR RISER PIPING INSIDE CHASE TO LIMIT NUMBER OF JOINTS. COORDINATE WITH ENGINEER FOR PRIOR APPROVAL.
    ALL EXPOSED INSULATION SHALL BE PROTECTED WITH UV RESISTANT PAINT OR ALUMIN. SHIELD.
14. ARMAFLEX INSULATION SHALL BE USED FOR SUCTION LINES (1/2" FOR ABOVE 40° F AND 1" FOR BELOW 40° F) PER FLORIDA ENERGY CODE TABLE 4–11 FOR PIPING INSULATION. FILTER/DRYER AND SIGHT GLASS SHALL BE PROVIDED AT LIQUID LINES.
15. ALL BRANCH TAKE–OFFS TO BE PROVIDED W/ MANUAL VOLUME DAMPERS. PROVIDE RADIUS ELBOWS WHERE FEASIBLE, SQUARE ELBOWS AND TEE'S SHALL BE FURNISHED W/SINGLE FOIL TURNING VANES. PROVIDE MANUAL VOLUME DAMPERS WITH EXTRACTOR AT ALL FLEX TAKE–OFFS. PROVIDE REMOTE, CABLE OPERATED VOLUME DAMPERS IN INACCESIBLE AND HARD CEILING AREAS, "YOUNG REGULATOR" OR EQUAL.
16. PROVIDE NEW FILTERS FOR ALL AIR CONDITIONING EQUIPMENT BEFORE START–UP, REPLACE PRIOR TO FINAL ACCEPTANCE BY OWNER.
17. PROVIDE SMOKE DETECTORS WITH SERVICE ACCESS DOORS IN ALL SUPPLY & RETURN AIR DUCTS FOR FANS AND AHU'S SERVING A COMMON PLENUM OF 2000 CFM OR ABOVE. FOR SMOKE DETECTORS NOT VISIBLE, IN CONCEALED SPACES, PROVIDE REMOTE ANNUNCIATION/TEST STATION AS REQUIRED BY AUTHORITY HAVING JURISDICTION, COORDINATE PRIOR TO INSTALLATION. DETECTORS SHALL BE BY ONE MANUFACTURER, COORDINATE VOLTAGE ETC. WITH ELECTRICAL CONTRACTOR AND FIRE ALARM SYSTEM BEFORE ORDERING. UPON DETECTION, SMOKE DETECTORS SHUT DOWN ASSOCIATED AIR MOVING EQUIPMENT AND ALL AIR MOVING EQUIPMENT SERVING THAT COMMON PLENUM.
18. PROVIDE TYPE "B" DYNAMIC FIRE DAMPERS WITH SERVICE ACCESS DOORS IN ALL DUCTS AND OPENINGS PENETRATING FIRE RATED WALLS, MECHANICAL AND ELECTRICAL EQUIPMENT ROOMS, TENANT SEPARATION, PARTITIONS, FLOOR OR ROOF SLABS AND AT OUTSIDE AIR INTAKES AS REQUIRED. PROVIDE RADIATION DAMPERS IN RATED CEILINGS FOR ALL CEILING OPENINGS, CEILING FANS, DIFFUSERS OR GRILLES RATED FOR USE IN THE CEILING ASSEMBLY.
    PROVIDE LOW–LEAKAGE CLASS DAMPERS FOR ALL SITUATIONS WHERE THE AIRFLOW CFM HAS TO BE CONTROLLED. VERIFY AND REPLACE AS REQUIRED FOR EXISTING SYSTEMS.
19. HVAC CONTRACTOR SHALL PROVIDE A T & B REPORT PER F.B.C. 2014, FOR BOTH EXISTING 1ST FLOOR AND NEW SYSTEMS. T & B SHALL BE PROVIDED BY AN INDEPENDANT CONTRACTOR. T & B SHALL INCLUDE ALL MECHANICAL EQUIPMENT, AIR DEVICES, DAMPERS, AHU'S AND FANS. THE TEST AND BALANCE REPORT SHALL BE IN ACCORDANCE WITH THE AIR BALANCE COUNCIL STANDARDS AND SHALL INCLUDE AIR QUANTITIES FOR ALL SUPPLY GRILLES, RETURN GRILLES AND EXHAUST GRILLES AND THE LEAVING AND ENTERING AIR TEMPERATURE (°F) FROM SUPPLY GRILLES AND EVAPORATORS.
20. THERMOSTAT LOCATION SHALL BE APPROVED BY OWNER AND ENGINEER BEFORE INSTALLATION. INSTALL THERMOSTAT 48" (MAX.) A.F.F. PER A.D.A REQUIREMENTS WHERE APPLICABLE. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR ALL REQUIREMENTS FOR JUNCTION BOXES, CONDUITS, CONTROL WIRING, POWER, ETC. AND DEFINE RESPONSIBILITIES AND SCOPE OF WORK FOR EACH TRADE PRIOR TO ANY PURCHASING OR INSTALLATION.
21. RUN INSULATED FIRE RATED CONDENSATE DRAINS AS REQUIRED.
22. ALL INSULATION WILL HAVE FIRE/SMOKE RATING LESS THAN 25/50.
23. MECHANICAL EQUIPMENT ON ROOF OR ELEVATED STRUCTURES SHALL COMPLY WITH FBC 2014 PAR. 306.5 IF INSTALLED HIGHER THAN 16 FEET A.F.F.
    MECHANICAL EQUIPMENT SHALL BE PROTECTED WITH MECHANICAL BARRIERS IF EXPOSED TO MECH. DAMAGE. ALL EQUIPMENT SHALL BE INSTALLED ON 6" CONCRETE PAD AT GRADE LEVEL .
24. PROVIDE A MIN. OF 36" CLEARANCE IN FRONT OF ALL 120–208 VOLT PANELS AND MIN. 42" CLEARANCE IN FRONT OF ANY 240–480 VOLT PANEL. PROVIDE ADEQUATE SIDE CLEARANCE PER NEC.
25. MECHANICAL PLANS IN GENERAL, ARE DIAGRAMMATIC IN NATURE, AND ARE TO BE READ IN CONJUNCTION WITH ARCHITECTURAL, PLUMBING, ELECTRICAL, AND STRUCTURAL PLANS AND SHALL BE CONSIDERED AS ONE SET OF DOCUMENTS. DUCT AND PIPING OFFSETS, BENDS AND TRANSITIONS SHALL BE REQUIRED TO PROVIDE AND INSTALL A COMPLETE FUNCTIONAL SYSTEM AND SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. CHANGES IN DUCTWORK SIZE AND ROUTE WILL BE REQUIRED TO AVOID STRUCTURAL, PLUMBING, FIRE SPRINKLER AND ARCHITECTURAL BUILDING FEATURES. DUCTWORK CHANGES MAY BE MADE BY CONTRACTOR USING EQUIVALENT SIZED DUCT. CONTACT ENGINEER IF DUCT AREA WILL NOT FIT.
26. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BIDDING, ORDERING, FABRICATION OR INSTALLATION OF MATERIALS OR EQUIPMENT.
27. CONDENSATE DRAIN PIPING TO BE AS SPECIFIED PER PLUMBING PLANS, IF NOT SPECIFIED TO BE TYPE "L" COPPER OR PVC WHERE ALLOWED BY CODE WITH 1/2" ARMAFLEX INSULATION. PROVIDE APPROVED WATER LEVEL DETECTOR OR FLOAT SWITCH TO AUTOMATICALLY SHUT DOWN THE AIR COND. UNIT, AS A SECONDARY DRAIN SYSTEM TO COMPLY WITH FMC 2004, SEC. 307 SUPPLY CONDENSATE PUMP WHERE NECESSARY AS IMPOSED BY FIELD CONDITIONS OR INSTALLATION CHANGES AND PIPE TO CONDENSATE DRAIN PER PLUMBING PLANS.
28. MANUFACTURER'S WARRANTY: CONTRACTOR SHALL PROVIDE WARRANTY FOR A PERIOD OF ONE YEAR AFTER BUILDING SUBSTANTIAL COMPLETION. FOR ALL MECHANICAL SYSTEMS, CONTROLS ACCESSORIES AND ALL OTHER EQUIPMENT, PARTS AND LABOR UNDER THESE DRAWINGS AND AND SPECIFICATIONS. CONTRACTOR SHALL PROVIDE WARRANTY FOR COMPRESSORS FOR (5) FIVE YEARS. ANY REPAIRS REQUIRING SYSTEM SHUTDOWN WILL BE DONE DURING NON–OPERATIONAL PERIODS OR AS AGREED WITH OWNER.
29. AUXILARY DRAIN PANS SHALL BE INSTALLED UNDER ALL COILS ON WHICH CONDENSATION CAN OCCUR AND UNDER ALL UNITS IN CONCEALED SPACES OR ANY AREA WHERE BLDG. DAMAGE CAN OCCUR AS A RESULT OF AN OVERFLOW, TO COMPLY WITH FBC 2014, PAR. 307.2.
30. ALL MATERIALS IN MECHANICAL PLENUMS AND HVAC CLOSETS SHALL BE OF NON–COMBUSTIBLE MATERIALS.

SHEET INDEX

MECHANICAL LEGEND

- SUPPLY AIR CEILING DIFFUSER
- RETURN AIR CEILING GRILLE
- SIDE WALL GRILLE
- FIRE DAMPER
- VOLUME CONTROL DAMPER
- COMBINATION THERMOSTAT/HUMIDISTAT
- REDUCER (WHERE DUCT SHOWN ONE LINE)
- EXIST. FLEX DUCT (SHOWN ON DEMO PLAN)
- EXIST. DUCTWORK (SHOWN ON DEMO PLAN)
- EXIST. FLEX DUCT TO BE REMOVED (SHOWN ON DEMO PLAN)
- EXIST. DUCTWORK TO BE REMOVED (SHOWN ON DEMO PLAN)
- NEW FLEX DUCT
- W/H — NEW RECTANGULAR DUCTWORK
- RETURN AIR TRANSFER DUCT ONE LINE AND DOUBLE LINE
- CONDENSING UNITS ON A CONCRETE PAD
- AIR HANDLING UNIT, VERTICAL UNIT, SET ON STAND
- WALL MOUNTED EXHAUST FAN
- IN–LINE FAN
- SUPPLY AIR
- RETURN OR EXHAUST AIR
- DUCT SMOKE DETECTOR
- MD — MOTORIZED DAMPER
- VVT — 36" ELECTRICAL CLEARANCE
- VARIABLE AIR VOLUME BOX
- POINT OF DISCONNECTION
- POINT OF CONNECTION

HVAC ABBREVIATION LEGEND

AFF	ABOVE FINISH FLOOR	MCA	MINIMUM CIRCUIT AMPS (FOR WIRE SIZING)
AHU	AIR HANDLING UNIT	MOCP	MAXIMUM OVERCURRENT PROTECTION DEVICE AMPS
CD	CONDENSATE DRAIN	LAT	LEAVING AIR TEMPERATURE
CD	CEILING DIFFUSER	R/A	RETURN AIR
EF	EXHAUST FAN	O/A	OUTSIDE AIR
CU	CONDENSING UNIT	VD	VOLUME CONTROL DAMPER
EXH	EXHAUST	RAG	RETURN AIR GRILLE
FD	FIRE DAMPER	SAR	SUPPLY AIR REGISTER
EAT	ENTERING AIR TEMPERATURE		
EAG	EXHAUST AIR GRILLE		
AD	ACCESS DOOR		
PLCS.	PLACES		

GENERAL NOTES

MECHANICAL CONTRACTOR SHALL INSTALL ACTUAL EQUIPMENT WITH PROPER CLEARANCES FOR SERVICING OF EQUIPMENT. CONTRACTOR SHALL PROVIDE STATEMENT THAT THE INSTALLATION OF THE EQUIPMENT COMPLIES WITH MANUFACTURERS SPECIFICATION AND CLEARANCES REQUIREMENTS. ALL EQUIPMENT SHALL BE BASED ON APPROVED SUBMITTALS.

KITCHEN HOOD INSTALLATION DRAWINGS WILL BE PROVIDED BY HOOD FABRICATOR AND WILL INCLUDE DETAILS OF DUCT, EXHAUST FAN, SUPPLY FAN AND HOOD. HOOD FABRICATOR WILL PROVIDE SIGNED AND SEALED DRAWINGS BY A REGISTERED FLORIDA PROFESSIONAL ENGINEER.

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CHECKED BY: DHA
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REVISIONS

1509

M0.10

MECHANICAL LEGEND, GENERAL NOTES & INDEX

15010 - BASIC MECHANICAL REQUIREMENTS

A. CODES & REFERENCES

1. FLORIDA BUILDING CODE 2014 (5th EDITION).
2. SMACNA
3. NFPA 101
4. NFPA 90A
5. NFPA 99

B. SCOPE OF WORK

1. PROVIDE ALL REQUIRED PERMITS, LABOR, MATERIAL AND EQUIPMENT REQUIRED TO COMPLETE THE SCOPE OF THE PROJECT SHOWN ON THE DRAWINGS AND READY FOR OCCUPANCY AND USE BY OWNER. THE WORK SHALL INCLUDE BUT IS NOT LIMITED TO:
   a. REMOVAL, RELOCATION AND RE-INSTALLATION OF EXISTING EQUIPMENT AND SYSTEM.
   b. CONNECTIONS TO EXISTING OR NEW EQUIPMENT AND SYSTEMS.
   c. MODIFICATION OF EXISTING CHILLED OR HOT WATER SYSTEMS, STEAM SYSTEMS, CONDENSATE DRAINAGE, DUCTWORK, TEMPERATURE CONTROLS AND LIFE-SAFETY SYSTEMS.
   d. CUTTING AND PATCHING TO REMOVE EXISTING OR INSTALL NEW WORK.
   e. CLEANING AND TESTING.
   f. INSTRUCTION TO OWNER'S PERSONNEL.
2. ALL REMOVAL WORK AND DISRUPTIONS OF EXISTING SERVICES SHALL BE COORDINATED AND SCHEDULED IN ADVANCE WITH OWNER'S REPRESENTATIVES.
3. PROVIDE ALL BUILDING PENETRATIONS REQUIRED TO COMPLETE PROJECT. ALL PENETRATIONS TO BE PATCHED AND SEALED TO BE WATERTIGHT. MAINTAIN FIRE RATINGS OF EXISTING STRUCTURE.
4. PROVIDE ALL NECESSARY DUCT, EQUIPMENT AND PIPE SUPPORTS AND MATERIALS REQUIRED FOR INSTALLATION. PER THE REQUIRMENTS OF LOCAL, STATE OR FEDERAL CODES.
5. NOT ALL COMPONENTS REQUIRED ARE INDICATED ON THESE DRAWINGS. REFER TO MANUFACTURERS INSTRUCTIONS FOR ADDITIONAL REQUIRMENTS INCLUDING CONNECTION LOCATIONS, TYPES AND SIZES. PROVIDE ISOLATING VALVES AND UNIONS AT ALL EQUIPMENT CONNECTIONS.

C. REQUIRED SHOP DRAWINGS

1. INSULATION.
2. AIR DEVICES.
3. REFRIGERANT PIPING AND ACCESSORIES
4. DUCTWORK AND ACCESSORIES
5. THERMOSTATS AND INTERLOCK CONTROLS
6. AIR HANDLING UNITS AND CONDENSING UNITS
7. FILTERS

D. MAINTENANCE MANUALS

1. PROVIDE MAINTENANCE MANUALS FOR ALL NEW EQUIPMENT CONTAINING ALL OPERATING AND MAINTENANCE DATA, SUBMITTALS, WARRANTEES, DIAGRAMS, INSPECTION REPORTS AND VALVE LISTS IN A 3 RING BINDER WITH POCKETS FOR DRAWINGS. PROVIDE OWNER WITH 2 COPIES.

E. AS-BUILT DRAWINGS

1. THE CONTRACTOR SHALL MAINTAIN AN ACCURATE RECORD OF ALL CHANGES MADE TO THE CONTRACT DOCUMENTS (AS-BUILT).
2. THE CONTRACTOR SHALL PROVIDE THE ENGINEER 2 SETS OF COMPLETED AS-BUILT DRAWINGS.
3. THE PROJECT WILL NOT BE CONSIDERED COMPLETE UNTIL ACCURATE AS-BUILTS ARE DELIVERED.

F. SUBSTITUTIONS

1. EQUIPMENT AND DESIGN OF SYSTEMS INDICATED ON THE DESIGN DRAWINGS AND WITHIN THESE SPECIFICATIONS SHALL BE CONSIDERED AS "SPECIFIED STANDARD" OF QUALITY. NO SUBSTITUTIONS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER 10 DAYS PRIOR TO BID DATE.
2. ANY DEVIATION FROM SPECIFIED EQUIPMENT THAT AFFECTS THE ELECTRICAL REQUIREMENTS SHALL BE COORDINATED BY THE MECHANICAL CONTRACTOR AND EQUIPMENT VENDOR WITH THE ELECTRICAL CONTRACTOR PRIOR TO SUBMITTING BIDS.

G. WIND LOADS

1. ALL EQUIPMENT TO BE MOUNTED OUTSIDE SHALL BE FURNISHED WITH A NOA (NOTICE OF ACCEPTANCE) FOR WINDSTORM OR BE FURNISHED WITH AN ENGINEERED DETAIL GOOD FOR THE LOCAL WIND RATE. CONTRACTOR SHALL SUBMIT ENGINEERED SHOP DRAWINGS.

15050 - BASIC MATERIALS AND METHODS

A. ACCESS PANELS - FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY GENERAL CONTRACTOR, PANTED TO MATCH ADJACENT SURFACES.

1. PROVIDE FOR ACCESS TO ALL SERVICEABLE EQUIPMENT IN WALLS AND CEILINGS.
2. MICOR STYLE M FOR DRYWALL.
3. MICOR STYLE K FOR PLASTER.
4. MINIMUM SIZE 16"x16" .
5. NYSTROM, KARP, J.L. INDUSTRIES OR WILLIAMS PAINT.

B. LABELING

1. PROVIDE RIGID PLASTIC EMBOSSED EQUIPMENT NAMETAGS FOR ALL NEW EQUIPMENT AND DISCONNECTS. SETON NAMEPLATE CORPORATION.

C. MECHANICAL SYSTEMS CLEANING

1. CLEAN AND TOUCH UP ALL FACTORY FINISHES.
2. VACUUM AND CLEAN ALL HVAC SYSTEMS BEFORE CONNECTION TO EQUIPMENT.

D. CLEANING TESTING AND ADJUSTING

1. THE MECHANICAL CONTRACTOR, AT HIS EXPENSE, SHALL CLEAN, REPAIR, ADJUST, CHECK, BALANCE AND PLACE IN SERVICE THE VARIOUS SYSTEMS HEREIN SPECIFIED WITH THEIR RESPECTIVE EQUIPMENT, ACCESSORIES AND PIPING. HE/SHE SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND TOOLS REQUIRED TO PERFORM TESTS REQUIRED BY THESE SPECIFICATIONS AND BY THE GOVERNING AUTHORITIES.
2. NO WORK SHALL BE COVERED OR CONCEALED UNTIL PROPERLY INSPECTED AND TESTED.

E HANGERS AND SUPPORTS

1. PROVIDE ALL NECESSARY DUCTWORK, PIPE SUPPORTS, HANGERS, RODS, CLAMPS AND ATTACHMENTS TO PROPERLY INSTALL AND SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM THE BUILDING STRUCTURE.
2. PROVIDE ANY ANGLE IRON OR UNISTRUT AND SUSPENSION RODS REQUIRED TO INSTALL EQUIPMENT, PIPING AND DUCTWORK.
3. ALL SUPPORTS EXPOSED TO OUTDOORS SHALL BE CLEANED, PRIMED AND PAINTED TO PREVENT RUSTING. FINISH COLOR AS SELECTED BY OWNER.
4. THE USE OF BALING WIRE OR PERFORATED METAL STRAPPING IS NOT PERMITTED FOR SUPPORTS.

F WARRANTY/GUARANTEE

1. THE CONTRACTOR SHALL WARRANTY/GUARANTEE AND MAINTAIN THE STABILITY OF WORK AND MATERIALS AND KEEP SAME IN PERFECT REPAIR AND CONDITION OF THE PERIOD OF ONE YEAR FROM SUBSTANTIAL COMPLETION.
2. DEFECTS OF ANY KIND DUE TO THE FAULTY WORK OR MATERIALS APPEARING DURING THE ABOVE MENTIONED PERIOD MUST BE IMMEDIATELY MADE GOOD BY THE CONTRACTOR AT HIS OWN EXPENSE TO THE ENTIRE SATISFACTION OF THE OWNER AND ENGINEER. SUCH RECONSTRUCTION AND REPAIRS SHALL INCLUDE DAMAGE TO THE FINISH OR FURNISHING OF THE BUILDING RESULTING FROM THE ORIGINAL DEFECT OR REPAIR THERETO.
3. EQUIPMENT SHALL BE GUARANTEED FOR ONE YEAR FROM SUBSTANTIAL COMPLETION AND COMPRESSORS SHALL HAVE EXTENDED WARRANTY FOR 5 YEARS.

15060 - PIPING

A. TYPE L HARD COPPER PIPE USED FOR:

1. COOLING COIL CONDENSATE PIPING.
2. REFRIGERANT PIPING

B. OUTDOORS EXPOSED INSULATED PIPING:

1. ALL OUTDOOR EXPOSED INSULATED PIPING SHALL BE PAINTED WITH TWO COATS OF ARMAFLEX STANDARD WHITE WB FINISH. PRIOR TO APPLYING THE FINISH, THE INSULATION SHALL BE WIPED CLEAN WITH DENATURED ALCOHOL. THE FINISH SHALL NOT BE TINTED.
2. ALL OUTDOOR EXPOSED PIPING SHALL HAVE THE SEAMS LOCATED ON THE LOWER HALF OF THE PIPE.
3. CONTACT MANUFACTURER FOR ALTERNATIVE PRODUCTS.

15103 - SLEEVES

A. SLEEVES TO BE 18 GAGE SHEET METAL OR SCHEDULE 40 PIPE. SLEEVE THE FOLLOWING:

1. MASONARY WALLS SLEEVE ALL PIPE PENETRATIONS.
2. FLOORS SLEEVE ALL HVAC PIPING. EXTEND SLEEVES 1/2 " ABOVE FINISHED FLOOR (2" ABOVE FINISHED FLOORS IN MECHANICAL ROOMS).
3. NON-FIRE RATED PARTITIONS NO SLEEVES REQUIRED. SEAL WALL TO INSULATION.
4. USE U.L. LISTED ASSEMBLY FOR ALL PENETRATIONS THRU RATED CONSTRUCTION.

15242 - VIBRATION ISOLATION

A. ACCEPTABLE MANUFACTURERS:

1. MASON INDUSTRIES.
2. KINETICS NOISE CONTROL.
3. KORFUND.
4. AMBER BOOTH.

B. MASON TYPE SLF CONTROL FOR AHUS (UNLESS INTERNAL)

C. MASON SUPER W RUBBER PAD FOR FLOOR MOUNTED AHUS (IF INTERNAL).

D. MASON TYPE HS CEILING SUSPENDED FANS AND AHUS.

15250 - INSULATION

A. INSULATION, ADHESIVES, COATINGS, SEALERS, TAPES, ETC. SHALL HAVE A FLAME SPREAD OF 25 OR LESS AND SMOKE DEVELOPMENT OF 50 OR LESS IN ACCORDANCE WITH ASTM E-84, NFPA 225, UL 723 AND MEET THE REQUIREMENTS OF NFPA 90A. ALL INSULATING R-VALUES TO MEET THE REQUIREMENTS OF THE FLORIDA ENERGY CODE. INSULATION SHALL CONTAIN NO FORMALDEHYDE.

B. FLEXIBLE ELASTOMERIC INSULATION, ARMSTRONG "AP ARMAFLEX", MITCHEL, RUBATEX :

1. CONDENSATE DRAINS - 3/4 " THICK.
2. REFRIGERATION MACHINE EVAPORATOR - 2 LAYERS - 3/4 " THICK.
3. REFRIGERATION SUCTION LINES: 3/4 " THICK

C. BLANKET TYPE DUCT INSULATION, JOHNS MANVILLE, CERTAINTEED, KNAUF, OWENS CORNING, MINIMUM R=6.0, FOIL FACED KRAFT VAPOR BARRIER :

1. ALL SUPPLY, OUTSIDE AIR AND RETURN WHERE CONCEALED FROM VIEW, R-6 .

D. SEMI RIGID BOARD TYPE DUCT INSULATION 1.5lb DENSITY, CERTAINTEED 1B-300, JOHNS MANVILLE, KNAUF, OWENS CORNING:

1. ALL SUPPLY, RETURN AND OUTSIDE AIR WHERE EXPOSED.
2. MINIMUM DUCT INSULATION THICKNESS AND R VALUES ARE AS FOLLOWS:
   a. SUPPLY AND RETURN AIR IN UNCONDITIONED SPACE: 2" (R-6 MIN.)
   b. SUPPLY AND RETURN AIR IN CONDITIONED INTERIOR SPACE: 1.5" (R-4.2 MIN.)
   c. OUTSIDE AIR: 2" (R-6 MIN.)
   d. SUPPLY AIR IN CEILING RETURN AIR PLENUM: 1.5" (R-4.2 MIN.)
   e. RETURN AIR IN CEILING RETURN AIR PLENUM: NOT REQUIRED.
   f. DUCTWORK OUTSIDE OF BUILDING: 3" (R-8 MIN.)

FIBERGLASS DUCTWORK:

A. ALL DUCTWORK OPERATING AT OR BELOW 1.5" W.G. STATIC PRESSURE, 1500 FPM VELOCITY AND 250°F AIR TEMPERATURE CAN BE CONSTRUCTED OF 1 1/2" THICK (R-6) FIBROUS GLASS DUCT BOARD MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARD. ALL DUCTWORK LOCATED WITHIN CONDITIONED SPACE AT OR BELOW 1.5" W.G. STATIC PRESSURE, 1500 FPM VELOCITY AND 250°F AIR TEMPERATURE CAN BE CONSTRUCTED OF 1" THICK (R-4.2) FIBROUS GLASS DUCT BOARD MEETING THE REQUIREMENTS OF THE LATEST EDITION OF THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARD. ALL FLEX DUCT SHALL BE RATED CLASS I, UL-181 LISTED WITH METALIZED INNER AND OUTER FOIL LINERS.

B. FABRICATION AND INSTALLATION OF DUCT AND FITTINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA FIBROUS GLASS DUCT CONSTRUCTION STANDARD. FURTHERMORE, CLOSURE SYSTEMS FOR LONGITUDINAL SEAMS AND TRANSVERSE JOINTS SHALL BE IN ACCORDANCE WITH PROCEDURES NECESSARY TO COMPLY WITH SECTION III, CLOSURES.

15890 - SHEETMETAL DUCTWORK

A. ALL DUCT TO BE INSTALLED ACCORDING TO LATEST SMACNA STANDARDS.

15910 - SHEETMETAL ACCESSORIES

A. AIR INLETS AND OUTLET.

1. REFER TO SCHEDULE.
2. ALL ALUMINUM CONSTRUCTION.
3. ACCEPTABLE MANUFACTURERS: TITUS, PRICE, METAL-AIRE, CARNES, ANEMOSTAT, NAILOR.

FLEXIBLE INSULATED DUCT FOR SUPPLY AND RETURN AIR.

A. FLEXIBLE DUCT: UL 181, CLASS 1, MULTIPLE LAYERS OF ALUMINUM LAMINATE SUPPORTED BY HELICALLY WOUND, SPRING-STEEL WIRE; FIBROUS-GLASS INSULATION; POLYETHYLENE OR ALUMINIZED VAPOR-BARRIER FILM. FLEXMASTER, MASTERDUCT TYPE 5M LOW PRESSURE INSULATED OR EQUAL.

1. PRESSURE RATING: 10-INCH WG POSITIVE AND 1.0-INCH WG NEGATIVE.
2. MAXIMUM AIR VELOCITY: 4000 FPM.
3. TEMPERATURE RANGE: MINUS 20 TO PLUS 210 DEG F.
4. INSULATION R-VALUE: COMPLY WITH ASHRAE/IESNA 90.1, R-6 MINIMUM.
5. FLAME SPREAD: LESS THAN 25
6. SMOKE DEVELOPED: LESS THAN 50

B. CONNECT FLEXIBLE DUCTS TO METAL DUCTS, DIFFUSERS, OR TAKE-OFFS WITH DRAW BANDS AND PRESSURE SENSITIVE TAPE.

C. COMPLY WITH FMC SECTION 603, DUCT CONSTRUCTION AND INSTALLATION.

D. SPLICING OF TWO OR MORE SECTIONS SHALL NOT BE PERMITTED. DO NOT EXCEED CENTERLINE BEND RADIUS OF 1.5 X DIAMETER. TRIM DUCTS TO PROPER LENGHTS AND DO NOT ALLOW DUCTS TO SAG.

E. DUCTS SHALL BE SUPPORTED WITH APPROVED HANGERS IN ACCORDANCE WITH THE REQUIREMENTS OF FMC SECTIONS 603.10.1 THROUGH 603.10.3, OR BY OTHER APPROVED DUCT SUPPORT SYSTEMS DESIGNED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE. FLEXIBLE DUCTS SHALL BE CONFIGURED AND SUPPORTED SO AS TO PREVENT THE USE OF EXCESS DUCT MATERIAL, PREVENT DUCT DISLOCATION OR DAMAGE, AND PREVENT CONSTRICTION OF THE DUCT BELOW THE RATED DUCT DIAMETER IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS:

1. DUCTS SHALL BE INSTALLED FULLY EXTENDED. THE TOTAL EXTENDED LENGTH OF DUCT MATERIAL SHALL NOT EXCEED 5 PERCENT OF THE MINIMUM REQUIRED LENGTH FOR THAT RUN.
2. BENDS SHALL MAINTAIN A CENTER LINE RADIUS OF NOT LESS THAN ONE DUCT DIAMETER.
3. TERMINAL DEVICES SHALL BE SUPPORTED INDEPENDENTLY OF THE FLEXIBLE DUCT.
4. HORIZONTAL DUCT SHALL BE SUPPORTED AT INTERVALS NOT GREATER THAN 5 FEET. DUCT SAG BETWEEN SUPPORTS SHALL NOT EXCEED 1/2 INCH (12.7 MM) PER FOOT OF LENGTH. SUPPORTS SHALL BE PROVIDED WITHIN 1-1/2 FEET OF INTERMEDIATE FITTINGS AND BETWEEN INTERMEDIATE FITTINGS AND BENDS. CEILING JOISTS AND RIGID DUCT OR EQUIPMENT MAY BE CONSIDERED TO BE SUPPORTS.
5. VERTICAL DUCT SHALL BE STABILIZED WITH SUPPORT STRAPS AT INTERVALS NOT GREATER THAN 6 FEET.
6. HANGERS, SADDLES AND OTHER SUPPORTS SHALL MEET THE DUCT MANUFACTURER'S RECOMMENDATIONS AND SHALL BE OF SUFFICIENT WIDTH TO PREVENT RESTRICTION OF THE INTERNAL DUCT DIAMETER. IN NO CASE SHALL THE MATERIAL SUPPORTING FLEXIBLE DUCT THAT IS IN DIRECT CONTACT WITH IT BE LESS THAN 1-1/2 INCHES WIDE.

F. BALANCING DAMPERS

1. GENERAL - IN ALL DUCTWORK SYSTEMS, PROVIDE DAMPERS FOR PROPER CONTROL AND BALANCING OF AIR QUANTITIES. CONCEALED DAMPERS TO HAVE CONCEALED DAMPER REGULATOR. ALL COMPONENTS FOR PROPER OPERATION; (i.e. GEARS, LINKAGES, CABLE, ETC.) SHALL BE INCLUDED.
2. TYPE: OPPOSED BLADE.
3. MATERIAL: STEEL, 3V TYPE BLADES MOUNTED IN STEEL CHANNEL FRAME.
4. SHAFT: 1/2 " SQUARE ROD OPERATOR WITH END BEARINGS AND GASKET SEAL AT DUCT PENETRATIONS. TERMINATE SHAFT IN DAMPER FRAME WITH BUSHINGS.
5. OPERATOR: LOCKING QUADRANT HANDLE WITH DAMPER POSITION INDICATOR AND INSULATION STAND OFF MOUNTING BRACKET FOR EXTERNALLY INSULATED DUCTWORK.

G. ACCESS DOORS

1. ACCEPTABLE MANUFACTURERS: RUSKIN, VENCO, NAILOR.
2. SIZE ACCESS DOOR AS FOLLOWS:
   a. DUCT SIZES UNDER 12": DOOR SIZED SUFFICIENT TO EQUIPMENT OR REPLACE FUSIBLE LINK.
   b. DUCT SIZES 12" TO 20": 12"x12" DOOR.
   c. DUCT SIZES 20" TO 36": 18"x18" DOOR.
   d. DUCT SIZES 36" AND ABOVE: 24"x24" DOOR.
3. USE DOUBLE PANEL CONSTRUCTION, TWO SHEETS OF AT LEAST 24 GAUGE GALVANIZED STEEL WITH 1" THICK INSULATION BETWEEN PANELS.
4. MOUNT DOORS IN A RIGID FRAME OF AT LEAST 22 GAUGE FORMED GALVANIZED STEEL OR ALUMINUM.
5. PROVIDE LATCHES THAT PERMIT EASY REMOVAL OF ACCESS DOOR WHILE MAINTAINING POSITIVE CLOSING AND MINIMUM LEAKAGE.
6. PROVIDE SPONGE RUBBER GASKETS FOR ALL DOORS.
7. IN ACCORDANCE WITH NFPA 90A, IDENTIFY EACH ACCESS DOOR WITH 1/2 " HIGH STENCILED LETTERS AS 'FIRE DAMPER', 'SMOKE DAMPER', OR 'COMBINATION FIRE/SMOKE DAMPER'.

SPLIT SYSTEM A/C UNITS

ACCEPTABLE MANUFACTURERS
A. CARRIER
B. TRANE
C. LENNOX

A. OUTDOOR UNIT:
1. REFRIGERANT: R-410A.
2. HOUSING: STEEL, PAINTED WITH COASTAL CORROSION PROTECTION.
3. COMPRESSOR: HERMETIC WITH VIBRATION ISOLATION.
4. SERVICE VALVES: SOLID BRASS FOR LIQUID AND SUCTION LINES LOCATED OUTSIDE OF UNIT.
5. CONTROLS: FACTORY WIRED WITH THERMAL AND CURRENT OVERLOAD SENSORS.
6. COIL: ALUMINUM FINS, NON-FERROUS TUBING.
7. FAN: DIRECT DRIVE, PROPELLER TYPE, UPBLAST.
8. ACCESSORIES: PRECHARGED TUBING PACKAGE.

B. INDOOR UNIT:
1. REFRIGERANT: R-410A.
2. CASE: 20 GAUGE STEEL. ENAMEL PAINT.
3. FAN: FORWARD CURVE CENTRIFUGAL. STATICALLY AND DYNAMICALLY BALANCED. RESILIENTLY MOUNTED. THERMAL OVERLOAD PROTECTION.
4. COIL: ALUMINUM FINS. NON FERROUS TUBING. PRECHARGED WITH SUFFICIENT REFRIGERANT FOR SYSTEM.
5. CONTROLS: 24 VOLT TRANSFORMER AND FAN RELAY, SIZED TO INCLUDE OA DAMPER LOAD.
6. FILTER: THROWAWAY FILTER AND MOUNTING FRAME (MINIMUM MERV 8).
7. HEATER: U.L. LISTED. FACTORY INSTALLED AND WIRED.

15970 - TEMPERATURE CONTROLS

A. MOUNT THERMOSTATS 48" A.F.F. ALIGN WITH LIGHT/SWITCHES, DOOR SWINGS AND OTHER WALL MOUNTED DEVICES. COORDINATE LOCATION WITH ARCHITECT.

B. PROVIDE 24V DC CONTROL WIRING BETWEEN OA DAMPER AND CONDENSING UNIT. DAMPER SHALL OPEN WHEN CONDENSING IS ENERGIZED.

C. SEE SHEET M3.20 FOR MORE CONTROL SYSTEM SPECIFICATIONS AND DETAILS.

15990 - TEST AND BALANCE

A. PROVIDE COMPLETE INDEPENDENT TEST AND BALANCE OF ALL WATER AND AIR SYSTEMS IN ACCORDANCE WITH NEBB (NATIONAL ENVIRONMENTAL BALANCING BUREAU) OR AABC (ASSOCIATED AIR BALANCE COUNCIL) STANDARDS.

B. TEST AND BALANCE FIRM TO BE:

1. CERTIFIED TEST & BALANCE - (561) 961-5068, OR (954) 532-4772.
2. DADE TEST AND BALANCE, INC. - (954) 791-3194.
3. TOTAL DYNAMIC BALANCE - (954) 425-0764.
4. EARL HAGOOD, INC. - (305) 266-7070.
5. OR APPROVED EQUAL.

C. CONTRACTOR SHALL:

1. VISIT SITE AT START OF PROJECT AND COORDINATE REQUIRED BALANCING EQUIPMENT AND DAMPERS WITH MECHANICAL CONTRACTOR.
2. AIR SYSTEMS:
   a. MAKE CHANGES TO BELTS, PULLEYS, DAMPERS, VOLUME BOXES, ETC. TO OBTAIN DESIGN CONDITIONS AS REQUIRED BY TAB PROCEDURES.
   b. BALANCE SUPPLY, RETURN AND EXHAUST AIR OUTLETS WITHIN 10% OF DESIGN WHILE MAINTAINING REQUIRED PRESSURE RELATIONSHIPS. RECORD DESIGN AND ACTUAL TOTALS.
   c. MEASURE AND REPORT FAN RPM, FAN SUCTION PRESSURE, FAN DISCHARGE PRESSURE, FAN TOTAL PRESSURE AND PRESSURE DROP ACROSS COMPONENTS. DESIGN AND ACTUAL SUPPLY, RETURN, OUTSIDE AND EXHAUST AIR.
   d. ACTUAL AND DESIGN NAMEPLATE AMPERAGE ON FAN MOTORS.
   e. PRESSURE DIFFERENTIAL ACROSS DUCT SMOKE DETECTORS.
   f. ADJUST FANS FOR LOWEST STATIC PRESSURE REQUIRED TO DELIVER TO OUTLETS AS NOTED IN NEBB OR AABC PROCEDURES.
   g. MEASURE SUPPLY AND RETURN ENTERING AND LEAVING TEMPERATURES (DB/WB) ACROSS EACH COIL AND AT EACH SUPPLY DISCHARGE AND RETURN INLET AT UNIT.
3. PROVIDE WRITTEN REPORT AT LEAST ONE WEEK BEFORE FINAL INSPECTION AND A TECHNICIAN DURING FINAL INSPECTION OF PROJECT.

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COCONUT CREEK, FL 33073

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CHECKED BY: DHA
DATE: 12-12-16

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MECHANICAL SPECIFICATIONS

VVT BOX UNIT SCHEDULE

SELECTION DATA				PRIMARY AIR DATA			HEATER DATA		GEN. DATA			
UNIT TAG	MANUF. & MODEL	TYPE	INLET DIA.	MIN. CFM	MAX. CFM	MIN. Ps(")	KW	STEPS	VOLTAGE	LxWxH(")	WEIGHT(LB)	NOTES
VVT-15	TITUS DESV	SGL. DUCT	6"	100	450	0.5	3	1	208/1	40X12X10	50	1,2,3,4,5
VVT-16	TITUS DESV	SGL. DUCT	6"	100	450	0.5	3	1	208/1	40X12X10	50	1,2,3,4,5
VVT-17	TITUS DESV	SGL. DUCT	8"	200	600	0.5	2	1	208/1	40X12X10	50	1,2,3,4,5
VVT-18	TITUS DESV	SGL. DUCT	6"	400	0	0.5	–			40X12X10	50	1,3,5

NOTES:
1. CONTROLS TO BE DDC, PROVIDE ROOM THERMOSTAT/SENSOR WITH OVERRIDE CAPABILITY. PROVIDE LOCKING COVER
2. POWER BY DIV. 16. CONTROL WIRING BY CONTROL CONTRACTOR. CONTROL POWER TRANSFORMER BY VVT MANUFACTURER.
3. FOR LONGER DUCT CONNECTION TO BOX THAN RECOMMENDED INLET RUN, MAKE THE TAP FOR BOXES AT THE MAIN DUCTWORK SIZED FOR MAIN STATIC PRESSURE LOSS. REDUCE TAP DOWN TO BOXES INLET SIZE JUST BEFORE CONNECTION AND PROVIDE MIN. LENGTH OF DUCT TO INLET AS RECOMMENDED BY MANUFACTURER FOR PROPER PRESSURE READING
4. FOR BOXES WITH ELECTRICAL HEATER, BOX SHALL BE FUSED BY MANUFACTURER IF REQUIRED MCA (AMPS) IS BELOW THE MIN. AVAILABLE SIZE OF COMMERCIAL BREAKER. CONTRACTOR SHALL COORDINATE PRIOR TO PURCHASING.
5. REFER TO DRAWINGS FOR SERVICE ACCESS CONFIGURATION (RIGHT OR LEFT)

EXHAUST AIR CALCULATIONS

	SPACE SERVED OR UNIT TAG	SPACE AREA (SQ.FT.)	SPACE HEIGHT (FT)	SPACE VOLUME (CU.FT.)	VENTILATION REQ'D AC/HR OR CFM	TOTAL CFM REQUIRED	TOTAL CFM PROVIDED	NOTES
FIRST FLOOR	MEN'S LOCKER 115	433	9'	3,897	0.5 CFM/SF	217	450	1
	MENS RR 1	260	8'	2,080	50 CFM/WC	200	300	1
	RR-1 (114)	64	8'	1,030	50 CFM/WC	50	75	1
	RR-2 (113)	64	8'	430	50 CFM/WC	50	75	1
	TOTAL	–	–	–	–	517	900	1
	WOMEN'S LOCKER 130	178	9'	670	0.5 CFM/SF	34	200	1

NOTES:
1. CALCULATIONS ARE BASED ON LOCAL CODE REQUIREMENTS, FLORIDA BUILDING CODE 2014 (TABLE 403.3) AND ASHRAE 62-89.

AIR BALANCE SCHEDULE

AREA SERVED	EQUIPMENT TAG	CONDITIONED O.A. (CFM)	MAKE-UP AIR (CFM)	TOTAL O.A. (CFM)	EXHAUST AIR (CFM)
NEW ADDITION FIRST FLOOR	EF-8	X	X	X	900
	KEF-1 (HOOD)	X	X	X	1380
	KSF-1	X	1105	1105	X
	AHU-11	1200	X	1200	X
	TOTAL	1200	1105	2305	2280

NOTES:
1. BUILDING IS 1200 – 900 = 300 CFM POSITIVE WHEN KITCHEN HOOD IS NOT OPERATING.
2. BUILDING IS 2305 – 2280 = 25 CFM POSITIVE WHEN KITCHEN HOOD IS OPERATING.

OUTSIDE AIR CALCULATIONS

AREA SERVED OR UNIT TAG	NET OCCUPIABLE AREA SQ.FT.	VENTILATION RATE CFM / SQ.FT.	TOTAL NO. OF PEOPLE	VENTILATION RATE CFM / PERSON.	TOTAL VENT. REQUIRED	TOTAL CFM O/A PROVIDED	NOTES
OFFICES 1, 2, 3, 4	605	0.06	4	5 CFM	56		1, 2
OFFICE 5	109	0.06	1	5 CFM	35		1
LEAD WORKER OFFICES	237	0.06	4	5 CFM	34		1, 2
CORRIDORS	335	0.06	–	–	20	150	1
EMER. OPERATIONS TRAINING ROOM	636	0.06	20	5 CFM	138	150	1, 3
MENS LOCKER	443	0.50	–	–	222	250	1
BREAKROOM TRAINING ROOM	916	0.06	24	5 CFM	175	400	1, 4
TOTAL						950	

NOTES:
1. CALCULATIONS ARE BASED ON ESTIMATED MAX. OCCUPANCY RATES PER ARCHITECTURAL PLANS AND ASHRAE 62-89. VENTILATION RATES PER FLORIDA BUILDING CODE, 5TH EDITION, 2014 (TABLE 403.3) AND ASHRAE 62-89.
2. FOR OFFICE AND OTHER SIMILAR AREAS CALCULATIONS ARE BASED ON CONTINUOUS OCCUPANCY
3. FOR ASSEMBLY ROOMS, CONFERENCE ROOMS AND OTHER SIMILAR AREAS CALCULATIONS ARE BASED ON INTERMITTENT OR VARIABLE OCCUPANCY IN CONFORMITY WITH PAR. 6.1.3.4 OF ASHRAE 62-01.
4. MAKE UP AIR FOR THE KITCHEN HOOD REQUIRES A MINIMUM OF 276 CFM.

AIR CONDITIONING SPLIT SYSTEM SCHEDULE

CONDENSING UNIT

CU TAG	MANUFACTURER & MODEL	NOMINAL TONNAGE	CAP. STAGES	(S)EER/IPLV	REFRIG./LBS	LIQ./SUCT.	NO. FANS	FAN FLA(EA)	NO. COMP.	COMP.RLA(EA)	VOLTAGE/PH	MCA/MOCP	WEIGHT (LBS)	L x W x H (IN)	NOTES
CU-8	LENNOX/XC21-024-208	2.0	1	19.2	R-410A	3/8 / 7/8	1	–	1	11.7	208/1/60	20.0/25	331	36X40X47	
CU-9	LENNOX/XC21-036-208	3.0	1	17.0	R-410A	3/8 / 7/8	1	–	1	15.3	208/1/60	21.1/35	357	36X40X47	
CU-10	LENNOX/XC21-060-208	5.0	1	17.0	R-410A	3/8 / 1-1/8	1	–	1	25.7	208/1/60	34.9/60	357	36X40X47	
CU-11	SEE SHEET M3.20 FOR SCHEDULE DATA AND SPECIFICATIONS														

AIR HANDLING UNIT

AHU TAG	MANUFACTURER & MODEL	TOTAL MBH	SENSIBLE MBH	TOTAL CFM	O/A CFM	E.S.P.("W.G.)	ENT. DB/WB	LEAV. DB/WB	ROWS/FPI	FAN HP/FLA	HEATER KW	VOLTAGE/PH	MCA/MOCP	WEIGHT (LBS)	L x W x H (IN)
AHU-8	LENNOX/CBX32MV-024/030	24.0	20.3	800	–	0.4	80/67	56/54	3/14	0.5/–	5.0	208/1/60	28/30	183	21 X 20 X 49
AHU-9	LENNOX/CBX32MV-036	36.0	30.3	1200	–	0.6	80/67	56/54	3/15	0.5/–	5.0	208/1/60	28/30	183	21 X 22 X 51
AHU-10	LENNOX/CBX32MV-068-230	60.5	48.3	2000	–	0.6	80/67	56/54	3/15	1.0/–	9.0	208/1/60	50/60	244	21 X 28 X 58
AHU-11	SEE SHEET M3.20 FOR SCHEDULE DATA AND SPECIFICATIONS														

NOTES:
1. UNITS RATED PER ARI 210, 240 AND 270, APPROVED EQUAL: LENNOX, TRANE
2. PROVIDE WITH ORIFICE METERING DEVICE, LIQUID LINE FILTER DRYER AND MULTI-USE SERVICE VALVES
3. PROVIDE COMPRESSOR WITH CRANKCASE HEATER AND MIN. 5-YEAR WARRANTY
4. PROVIDE HIGH AND LOW PRESSURE CONTROL AND OVER TEMPERATURE PROTECTION.
5. PROVIDE WEATHERPROOF ELECTRIC CONTROLS AND SINGLE SIDE SERVICE ACCESS
6. PROVIDE SINGLE POINT POWER ENTRY AND HEAVY DUTY NICKEL-CHROMIUM ELEMENT HEATER
7. PROVIDE 2" THROWAWAY, MIN. 30% EFF. FILTER AND VIBRATION ISOLATION FOR AHU
8. PROVIDE FACTORY MOUNTED DISCONNECT/STARTER FOR A.H.U., COORDINATE PRIOR TO PURCHASING
9. PROVIDE 24/7 PROGRAMMABLE FACTORY THERMOSTAT
10. PROVIDE REFRIGERANT LINES SIZE AS RECOMMENDED BY MANUFACTURER, NOT TO EXCEED 100 FT. EQUIV. LENGTH FOR LONGER RUNS COORDINATE WITH MANUFACTURER PRIOR TO PURCHASE OR ANY WORK.
11. PROVIDE SMOKE DETECTOR IN SUPPLY AIR DUCT
12. PROVIDE TWO STAGE COMPRESSOR
13. PROVIDE VARIABLE SPEED AHU
14. PROVIDE INFINITY ZONE CONTROL DAMPER SYSTEM

COORDINATION NOTE:
MECHANICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS AND ACCESSORIES WITH ELECTRICAL CONTRACTOR PRIOR TO PURCHASING AND INSTALLATION AND SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF ENGINEER

FAN SCHEDULE

SELECTION DATA					FAN DATA		MOTOR DATA				GENERAL DATA				
TAG	SERVICE AREA	MANUF.(*)	MODEL	CONFIG.	CFM	ESP ("WG)	HP	RPM	DRIVE	VOLTAGE	WEIGHT (LBS)	DIMENSIONS L"xW"xH"	OPENING L"xW"	CONTROL	ACCESSORIES
EF-8	1ST FL TOILETS/LOCKERS	GREENHECK	VG G-101	IN-LINE CENTRIF.	900	0.50	0.25	1448	DIRECT	115	55	–	12.5X12.5	TIME CLOCK	1,2,3,4,7 & 8
KEF-1	KITCHEN EXH FAN	GREENHECK	VG CW-131	WALL CENTRIF.	1380	1.00	0.50	1500	DIRECT	208	55	–	12X12	HOOD SWITCH	1,2,3,4,5,6, & 7
KSF-1	KITCHEN SUPPLY FAN	GREENHECK	VG SQ-120	INLINE CENTRIF.	1105	0.75	0.50	750	DIRECT	208	70	21X19X19	–	INTERLOCKED WITH KEF-1	1,2,3,4,6,7 & 9

(*) APPROVED EQUAL MANUFACTURER: COOK, TWIN-CITY, ACME, PENN

ACCESSORIES NOTES:
1. PROVIDE BACKDRAFT DAMPER
2. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH
3. BEARINGS WITH GREASE FITTINGS
4. PROVIDE MOTOR WITH THERMAL OVERLOADS
5. PROVIDE W/FACTORY CURB
6. FAN SHALL BE HIGH WIND RATED AND HAVE A MIAMI DADE NOA.
7. PROVIDE WALL MOUNTING CURB OR VIBRATION ISOLATORS WHERE SUSPENDED FROM STRUCTURE.
8. MECHANICAL CONTRACTOR TO FURNISH TIME CLOCK FOR ON-OFF CONTROL. SEE ELECTRICAL DWGS FOR WIRING OF FAN THRU TIME CLOCK.
9. PROVIDE HOOD INTAKE AIR FAN WITH FILTER SECTION AND 1 SET OF EXTRA FILTERS.

GENERAL FAN NOTES:
a. ALL CONTINUOUS-DUTY MOTORS SHALL BE PROVIDED WITH OVERLOAD PROTECTION ACCORDING TO NATIONAL ELECTRICAL CODE PAR. 430-32.
b. FIELD ADJUST OPENINGS WITH STRUCTURE.
c. ALL OUTDOOR EQUIPMENT SHALL COMPLY WITH LOCAL ZONING NOISE ORDINANCE OR NOT EXCEED A NOISE LEVEL OF 65dB AS MEASURED RADIALLY 30 FT. FROM THE EQUIPMENT IN ALL DIRECTIONS.
d. COORDINATE WITH ELECTRICAL CONTRACTOR BEFORE BIDDING OR ORDERING ANY EQUIPMENT.
e. SEE PROJECT PLANS AND SPECIFICATIONS FOR OTHER FIELD SUPPLIED ITEMS AND ADDITIONAL INFORMATION.
f. ALL FANS ON WALLS SHALL BE PAINTED TO MATCH ADJACENT WALLS.

AIR DISTRIBUTION SCHEDULE

TAG	MANUF. & MODEL	FACE SIZE	NECK SIZE	MATERIAL	FRAME	FINISH	DAMPER	THROW	NC	CFM RANGE	NOTES
SUPPLY AIR											
A	TITUS / TMSA-AA	24x24	PER FLEX	ALUM.	LAY-IN	WHITE	OBD	VERTICAL	MAX. 30	SEE SCH.	1,2,3,4,5,6
B	TITUS / TMSA-AA	12x12	PER FLEX	ALUM.	LAY-IN	WHITE	OBD	SEE NOTE #2	MAX. 30	SEE SCH.	1,2,3,4,5,6
E	EXISTING										
RETURN AIR											
AA	TITUS / PAR-AA	24x24	SEE SCHEDULE	ALUM.	LAY-IN	WHITE	OBD	–	MAX. 30	SEE SCH.	3,4,6,7
BB	TITUS / PAR-AA	12X12	SEE SCHEDULE	ALUM.	SURFACE	WHITE	OBD	–	MAX. 30	SEE SCH.	3,4,6,7
ER	EXISTING										

SUPPLY AIR DIFFUSER OR GRILLE — RETURN OR TRANSFER AIR GRILLE

(*) EQUIVALENT MANUFACTURER: PRICE, METALAIRE, CARNES, T & B, NAILOR

GENERAL NOTES:
1. PROVIDE SPIN-IN COLLAR WITH VOLUME DAMPER AT TRUNK TO FLEX DUCT CONNECTION (SEE DETAIL).
2. PROVIDE TYPICAL 4-WAY DIFFUSION, 2-WAY, 3-WAY OR VERTICAL ONLY WHERE INDICATED ON PLANS.
3. REFER TO ARCHITECT PLANS FOR CEILING TYPE.
4. FINAL COLOR SELECTION SUBJECT TO ARCHITECT APPROVAL.
5. FLEX DUCT SIZE TO BE SAME AS DIFFUSER NECK SIZE.
6. CONTRACTOR TO COORDINATE FINAL SELECTION WITH ARCHITECT AND OWNER

TITUS PAR-AA SCHEDULE

NECK SIZE	CFM RANGE	NECK SIZE	CFM RANGE
6X6	0-200 CFM	15X15	0-1000 CFM
8X8	0-350 CFM	16X16	0-1300 CFM
10X10	0-540CFM	18X18	0-1350 CFM
12X12	0-700 CFM	22X22	0-2000 CFM

FLEX SCHEDULE

6ø"	50-125 CFM
8ø"	130-200 CFM
10ø"	205-330 CFM
12ø"	335-450 CFM
14ø"	455-700 CFM

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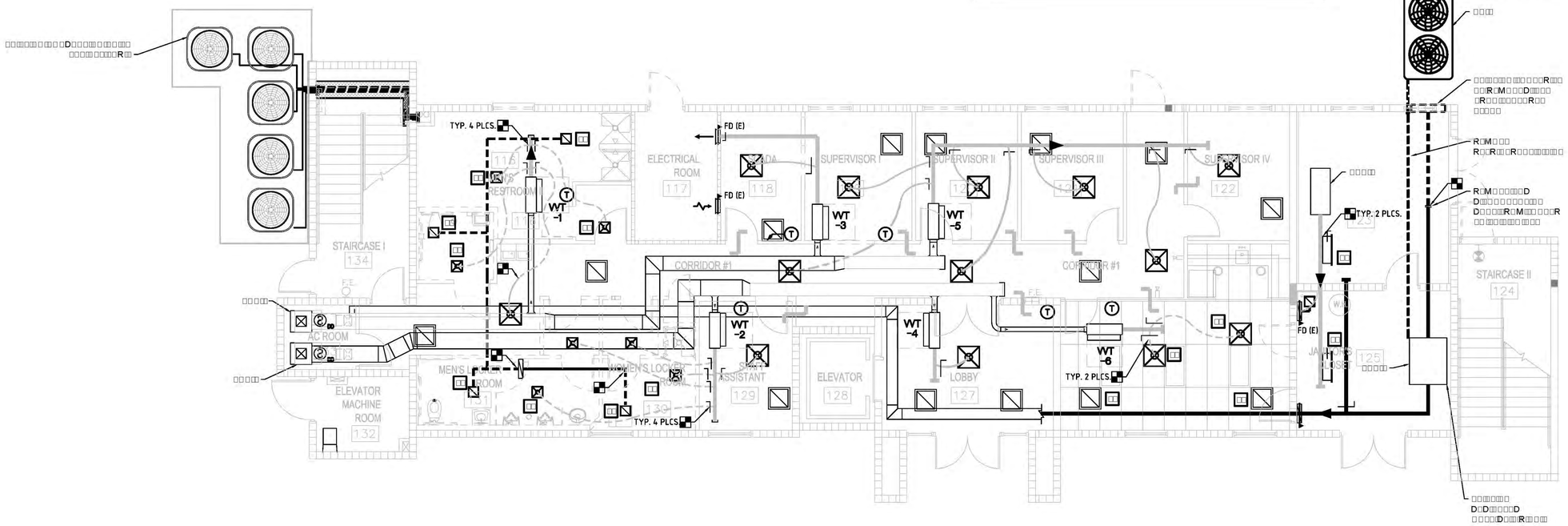
MECHANICAL SCHEDULES

MECHANICAL DEMOLITION NOTES

1. FOR EQUIPMENT AND SYSTEMS TO BE REMOVED, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE CONDITION , EXACT SIZES AND LOCATION OF EXISTING DUCT AND PIPING ETC. BEFORE DEMOLITION WORK IS STARTED. REPORT ANY DISCREPANCIES BETWEEN PLANS AND ACTUAL FIELD CONDITIONS TO THE ARCHITECT AND ENGINEER PRIOR TO THE COMMENCEMENT OF DEMOLITION WORK.
2. REMOVE THE INDICATED HVAC ITEMS AS SHOWN ON PLANS, THIS INCLUDES ALL HANGERS, STRAPS AND RELATED MATERIAL. EQUIPMENT AND MATERIALS SHALL BE REMOVED FROM THE SITE AND PROPERLY DISPOSED OF OR TURNED OVER TO THE THE OWNER IF THE OWNER WISHED TO KEEP FOR RE-USE.
3. CAP AND SEAL AIR TIGHT ALL POINTS AT WHICH DUCTWORK IS REMOVED FROM DUCTWORK THAT WILL REMAIN.
4. PATCH AND MATCH OPENINGS IN WALLS TO MAINTAIN THE INTEGRITY OF THE WALL WHERE AIR DEVICES, DUCTS, PIPING, ETC. HAVE BEEN REMOVED. (MAINTAIN THE EXISTING SYSTEM IN OPERATION TO THE MAXIMUM EXTENT POSSIBLE DURING DEMOLITION.)

KEYNOTES

- [1] REMOVE SIDEWALL SUPPLY GRILLES AND PATCH DUCT OPENING.
- [1] REMOVE EXISTING SUPPLY DUCT AND DIFFUSERS.
- [1] REMOVE EXISTING RETURN GRILLES.
- [1] REMOVE EXISTING EXHAUST GRILLES AND ASSOCIATED DUCT.



MECHANICAL DEMOLITION PLAN

3/16"=1'-0" NORTH

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UTILITIES AND ENGINEERING COMPLEX
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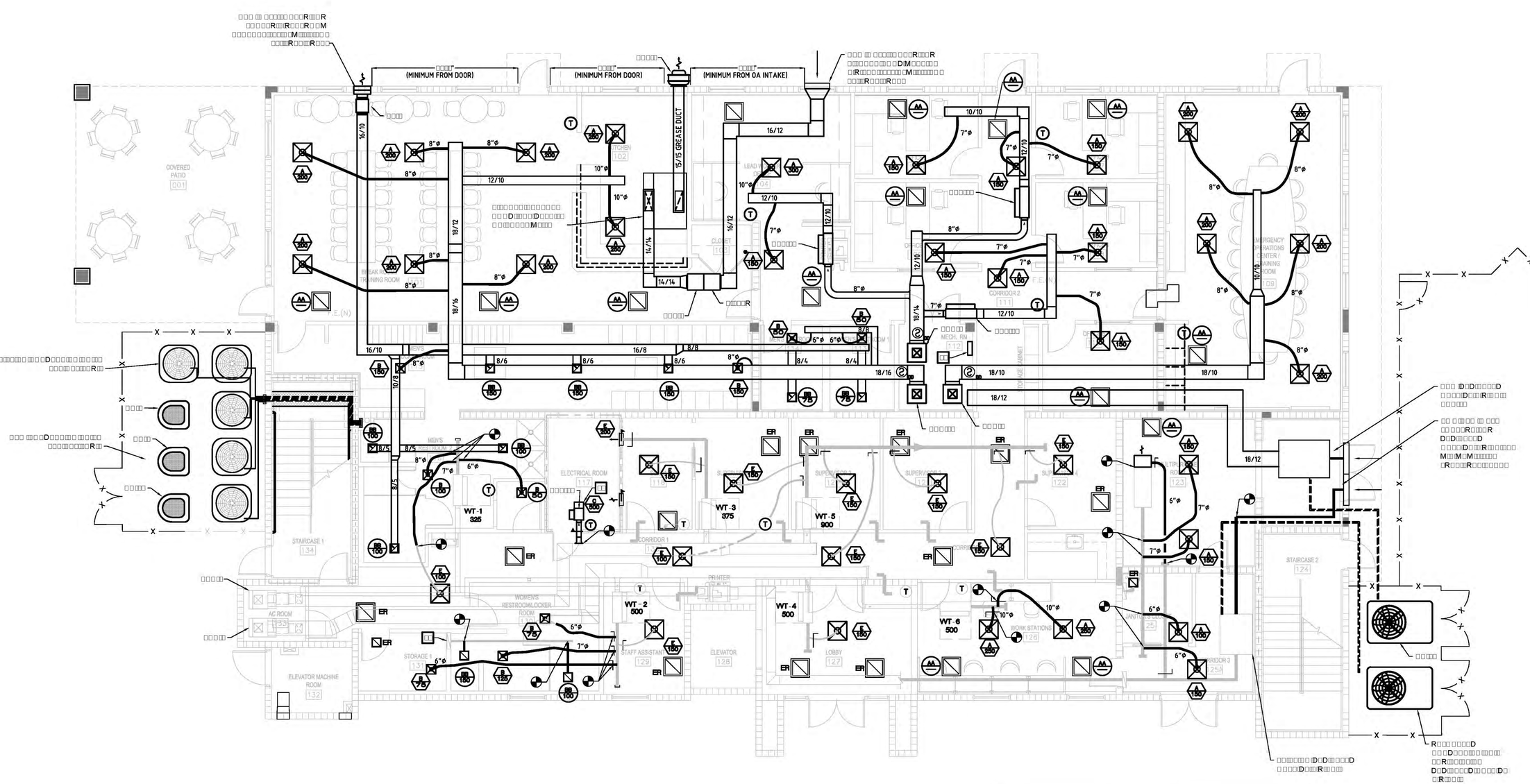
MECHANICAL DEMOLITION PLAN



MECHANICAL PLAN

3/16"=1'-0" NORTH

KEYNOTES

- E1 EXISTING ROOF MOUNTED EXHAUST FAN SHALL BE REBALANCED FOR NEW AIRFLOW.
- E1 PROVIDE 90 DEG. ELBOW POINTING DOWN TO FLOOR AND ATTACH TYPE C DUCT MOUNTED GRILLE.
- E1 VAV ZONE CONTROL PANEL FOR AHU-9 AND VAV TERMINALS

GENERAL NOTES

SPACE ABOVE CEILING IS USED AS A RETURN AIR PLENUM. ALL MATERIALS SHALL BE NON COMBUSTABLE AND/OR PLENUM RATED.

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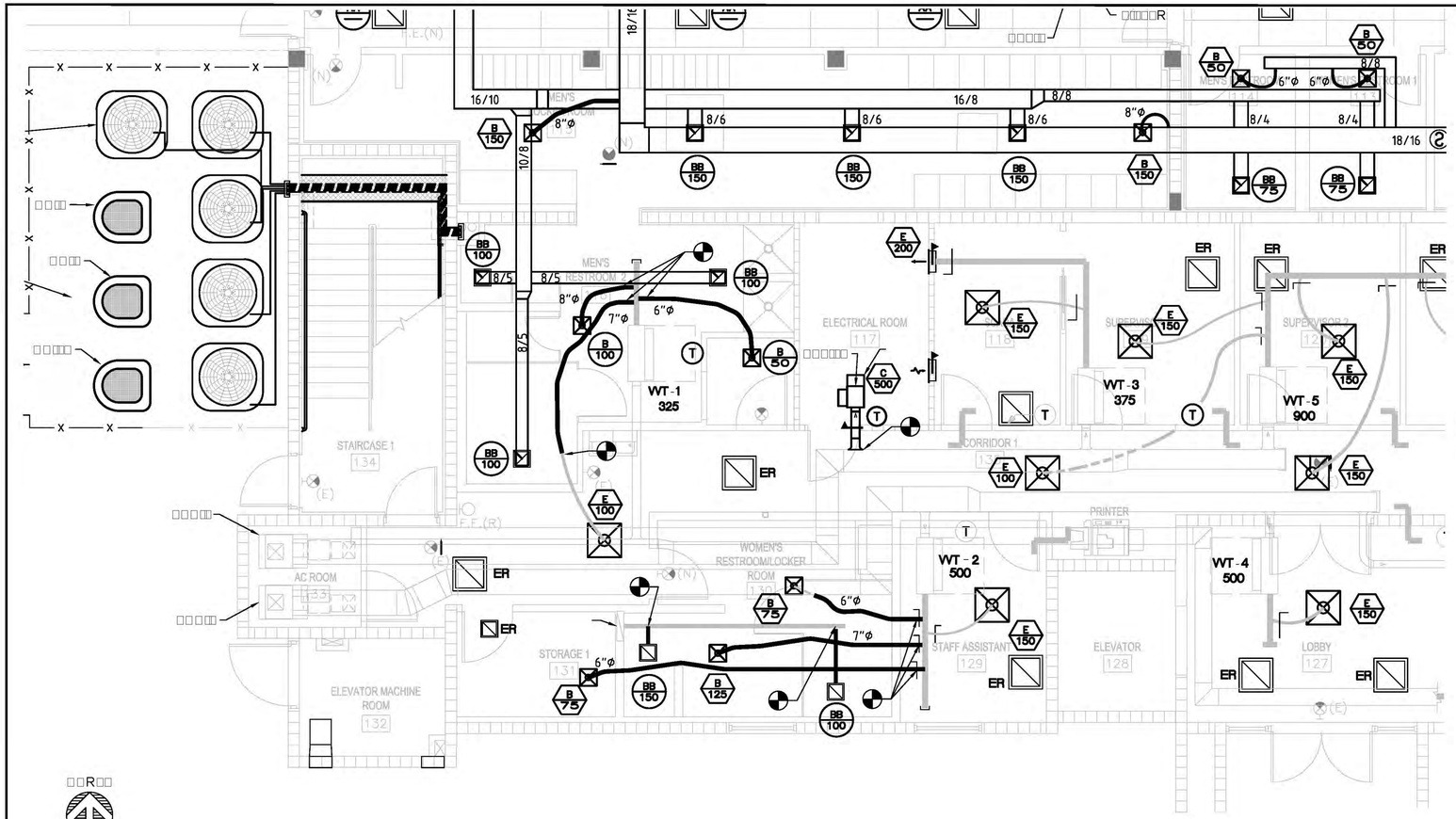
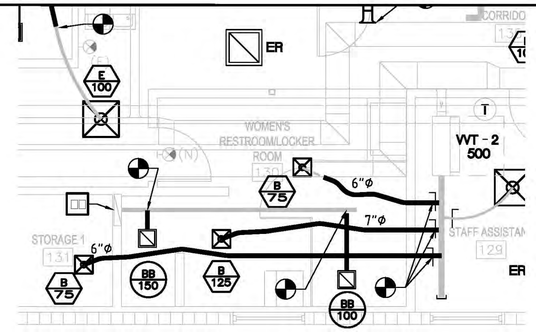
MECHANICAL PLAN



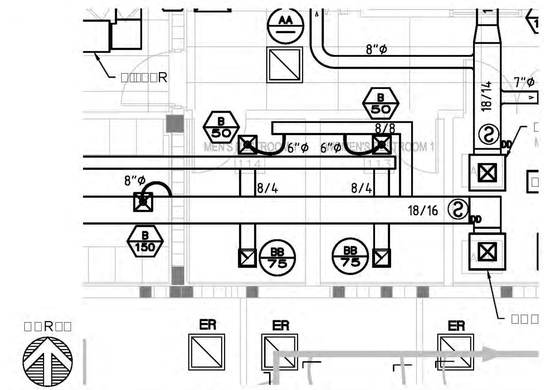
1 ENLARGED PLAN - MEN'S RESTROOM AND LOCKER ROOM

SCALE: 1/4" = 1'-0"



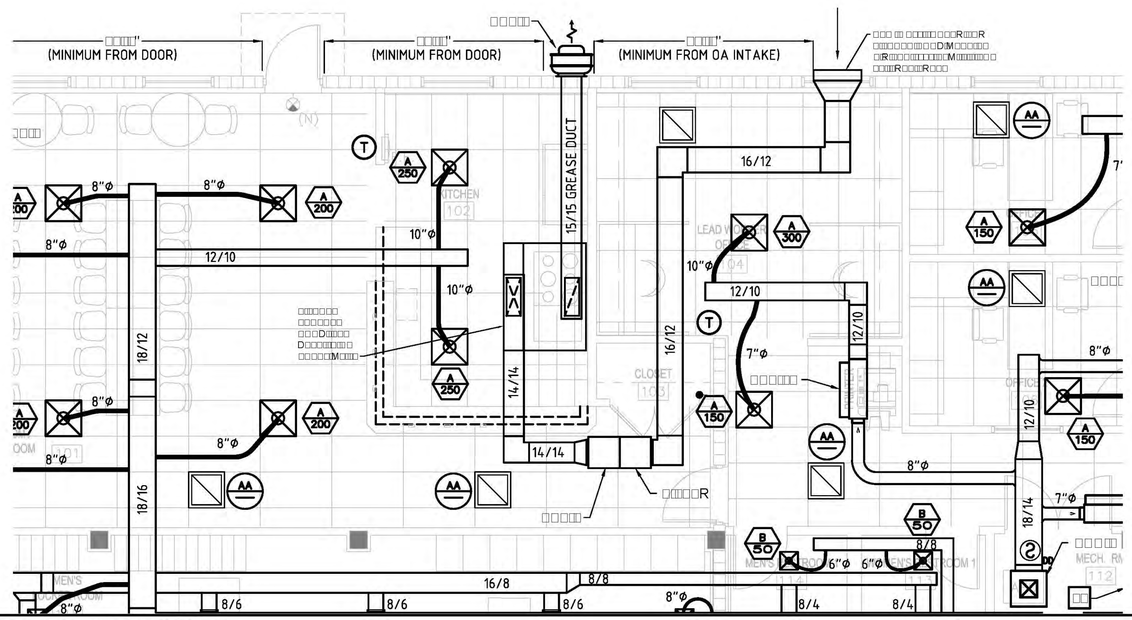
2 ENLARGED PLAN - WOMEN'S LOCKER ROOM

SCALE: 1/4" = 1'-0"



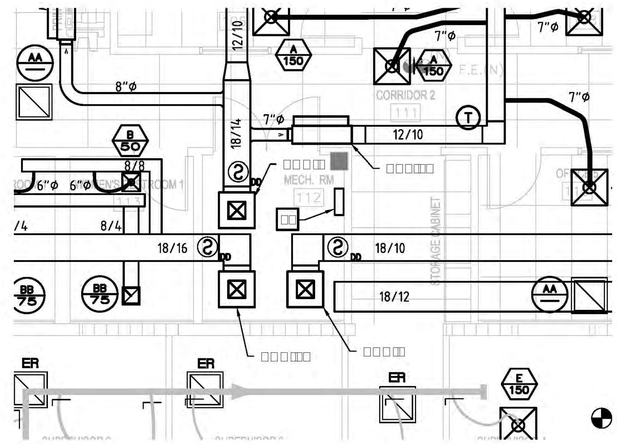
3 ENLARGED PLAN - MEN'S RESTROOM I AND WOMEN'S RRM I

SCALE: 1/4" = 1'-0"



4 ENLARGED PLAN - KITCHEN

SCALE: 1/4" = 1'-0"



5 ENLARGED MECHANICAL ROOM

SCALE: 1/4" = 1'-0"

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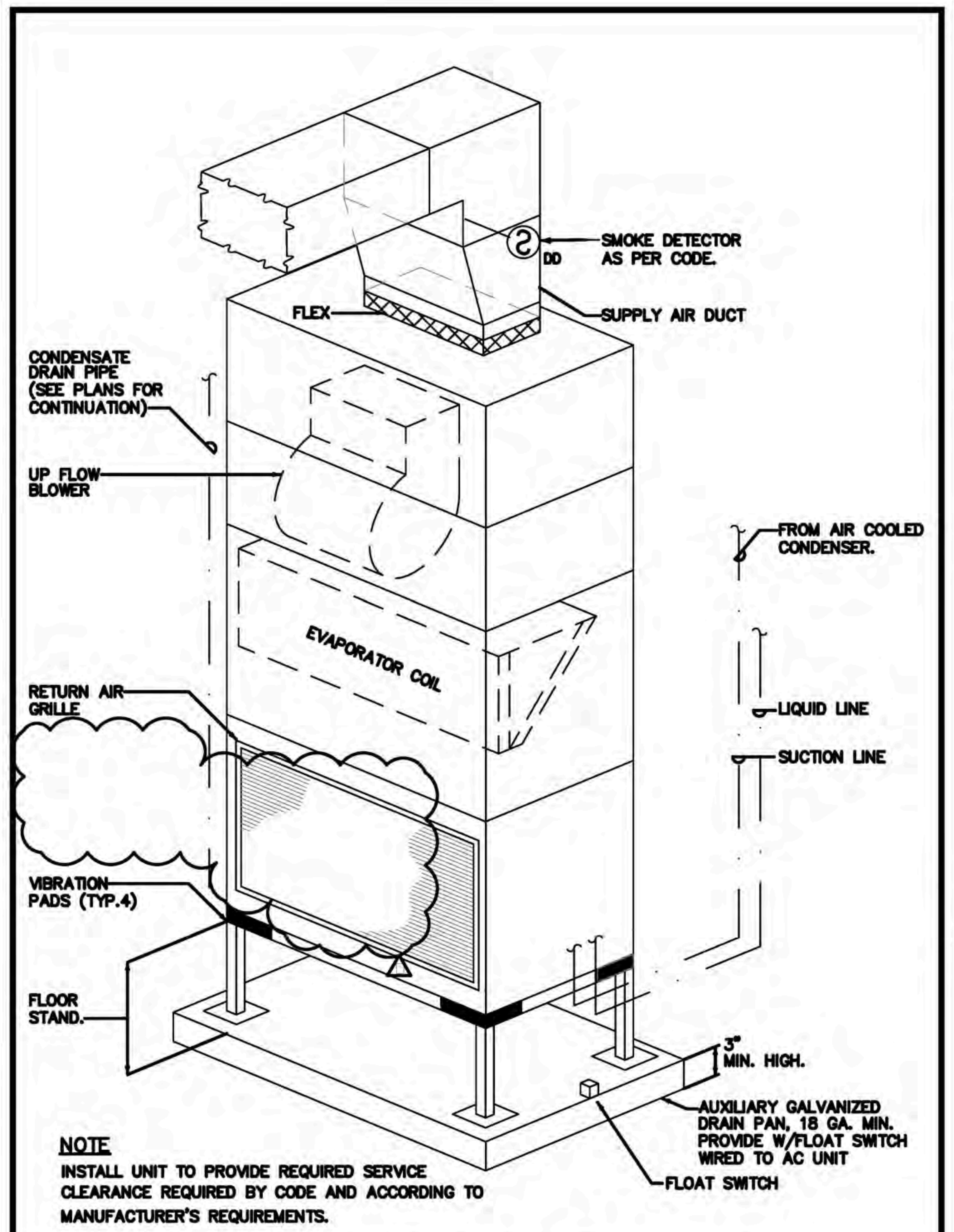
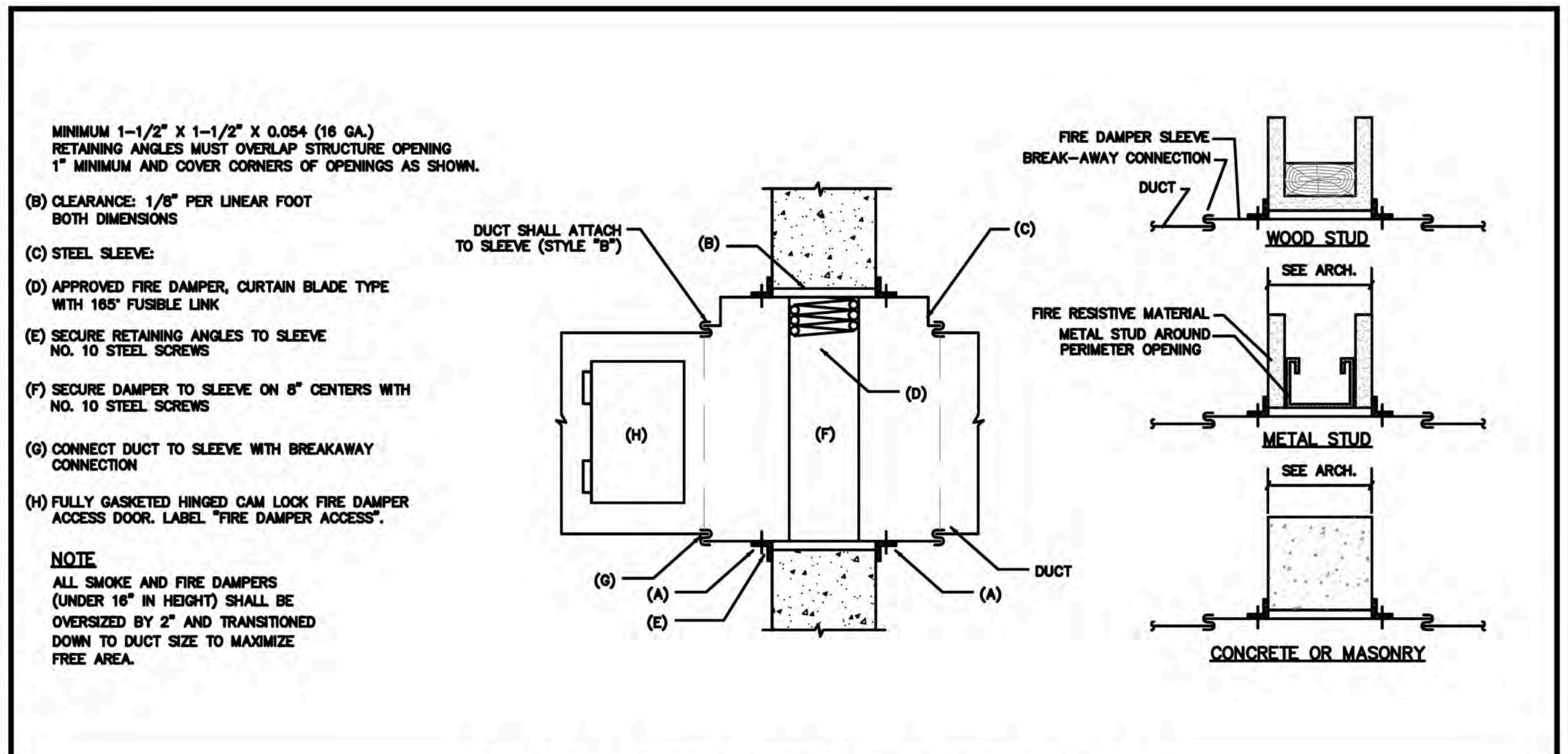
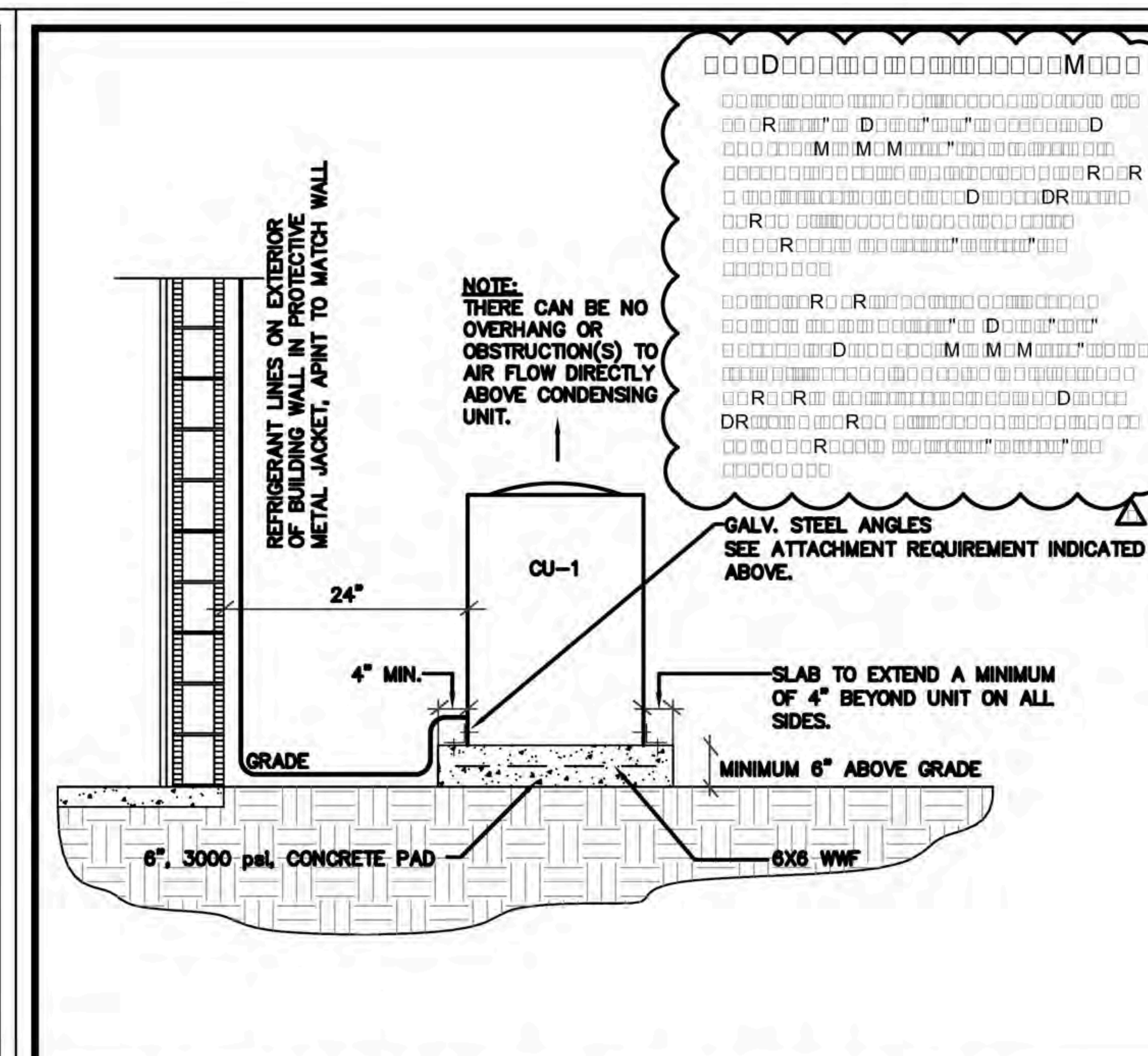
ENLARGED MECHANICAL PLANS



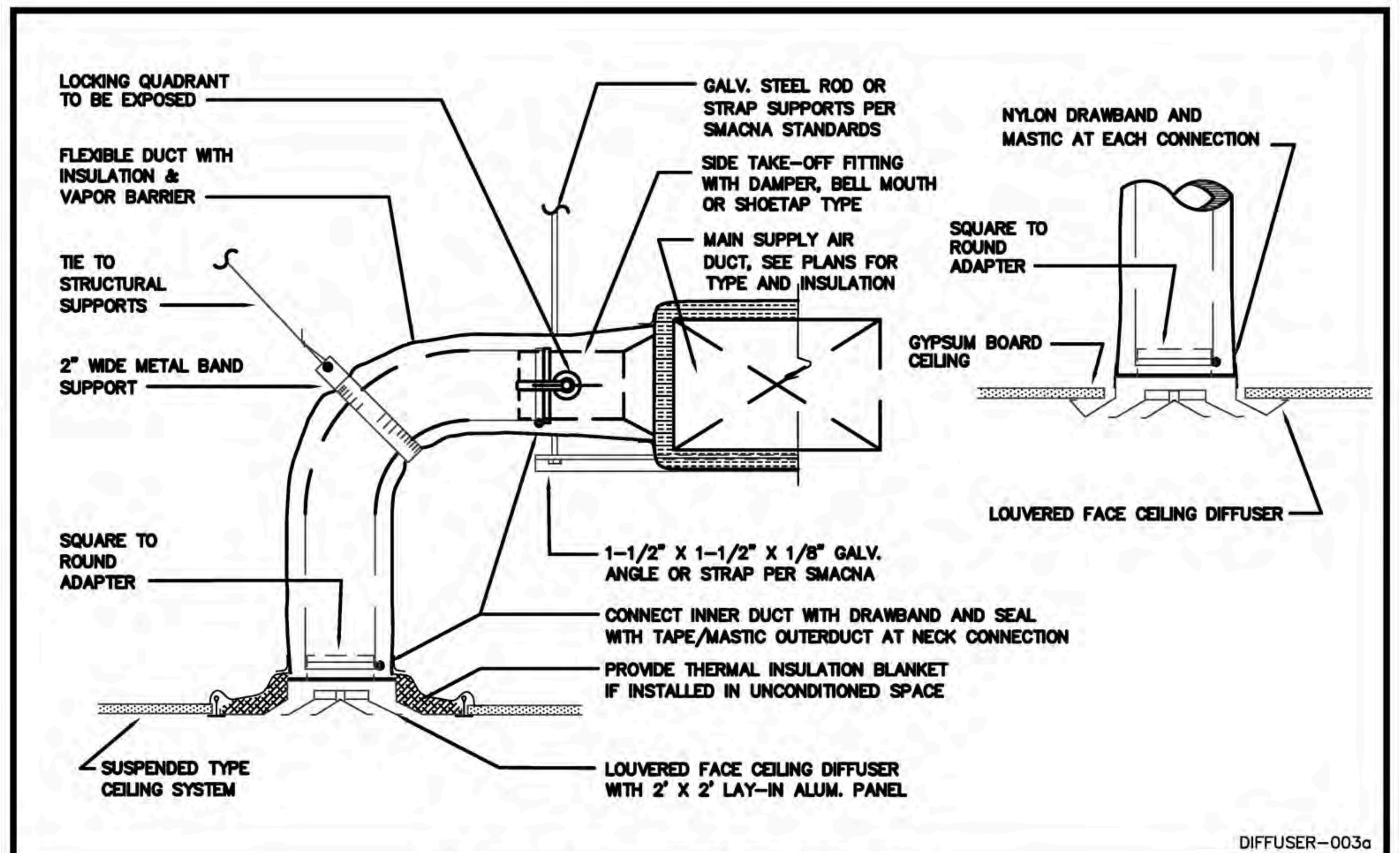
VERTICAL AHU MOUNTING DETAIL
NOT TO SCALE



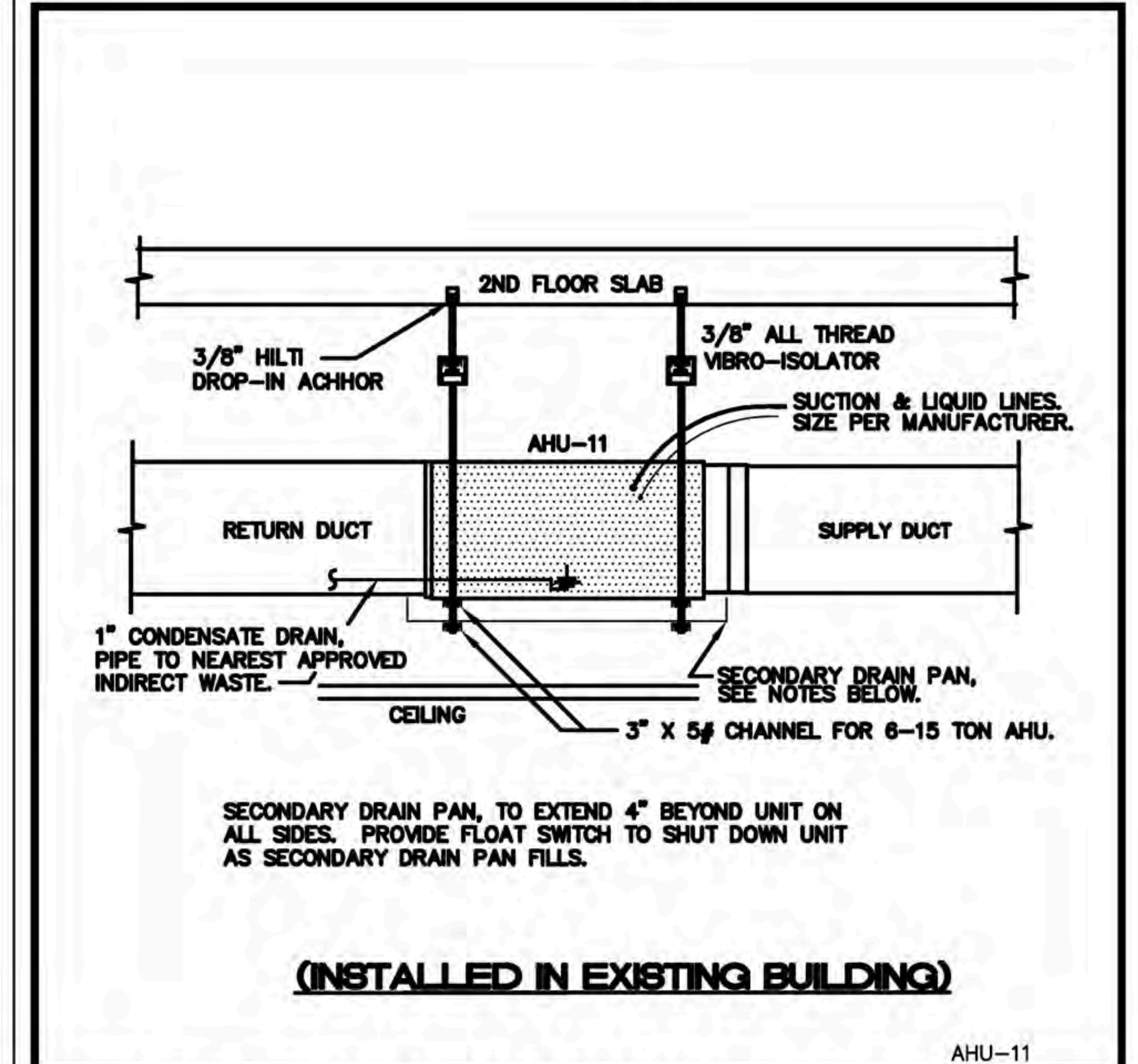
STYLE "B" DYNAMIC FIRE DAMPER DETAIL
NOT TO SCALE



CONDENSING UNIT MOUNTING DETAIL
NOT TO SCALE

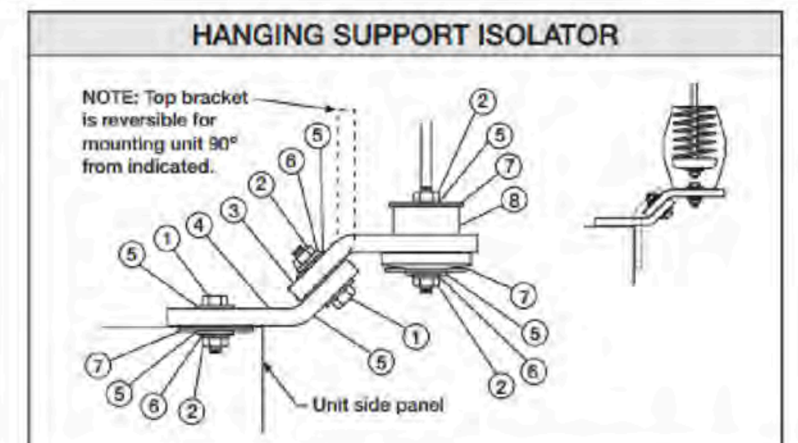


TYPICAL DIFFUSER DETAIL
NOT TO SCALE



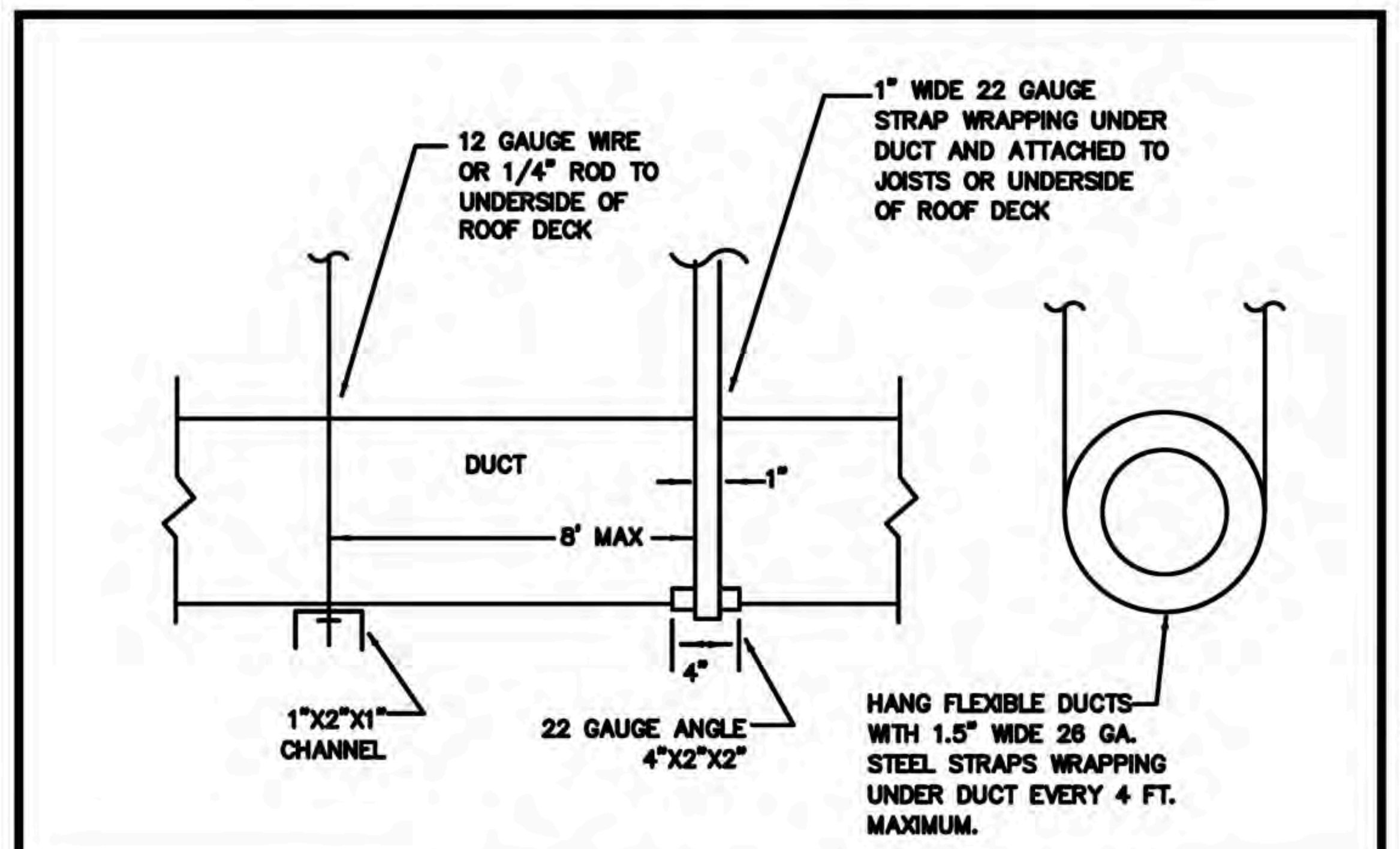
HORIZONTAL AHU MOUNTING DETAIL
NOT TO SCALE

HANGING SUPPORT ISOLATOR

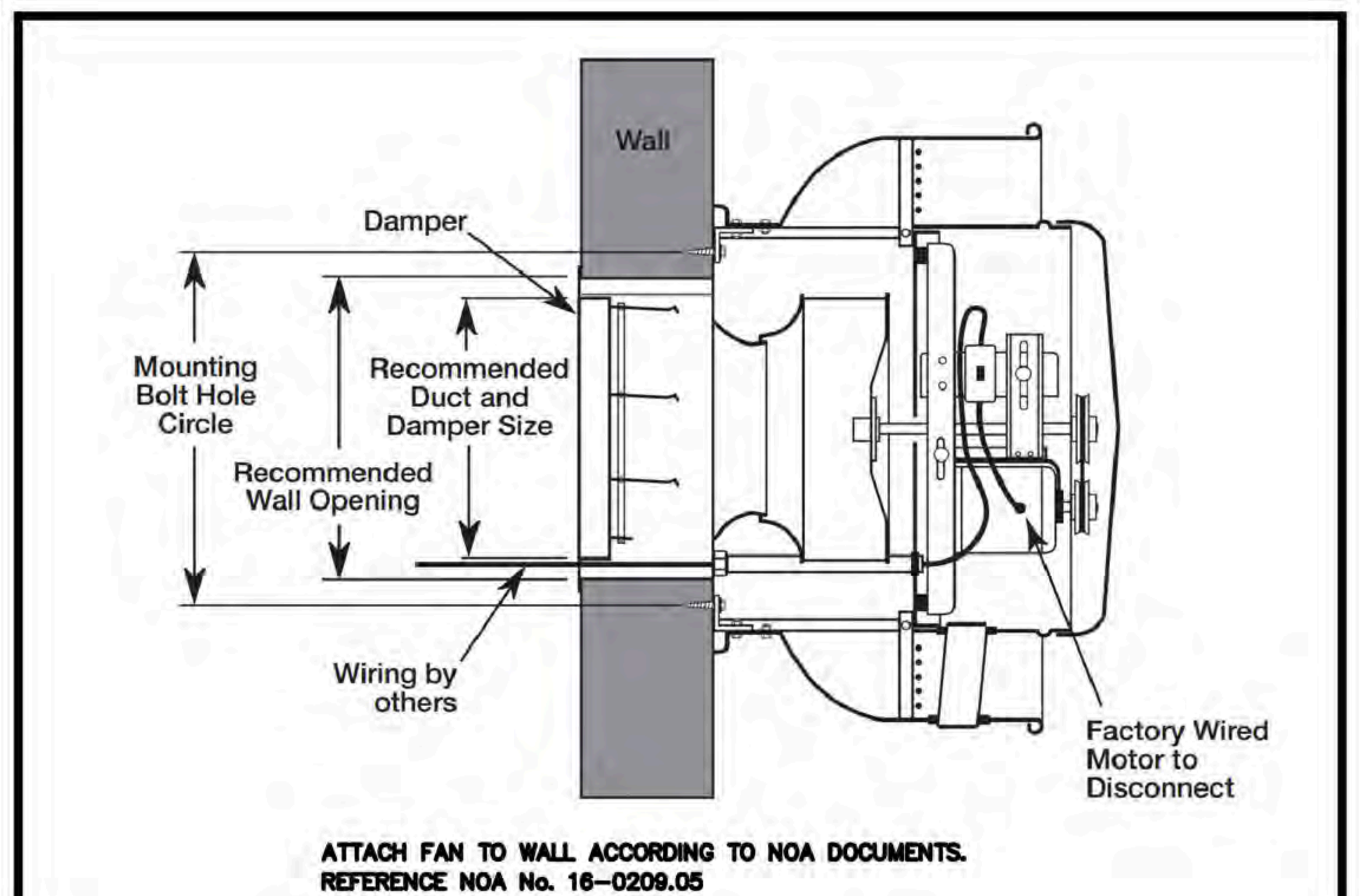


No.	Qty.	Description	SQ-60 thru 140 BSQ-100 thru 140	SQ-160 BSQ-160 thru 420
1	8	Cadium plated hex head bolts	3/8 in. - 16 x 1 in.	3/8 in.-16 x 1 1/4 in.
2	16	Cadium plated hex nuts	3/8 in. - 16	3/8 in. - 16
3	4	Std. mount bracket with (1) 1/4 in. hole	3/16 in.	1/4 in.
4	4	Std. mount bracket with (2) 7/16 in. holes	3/16 in.	1/4 in.
5	24	Cadium plated washer	7/8 in. O.D. x 3/8 in. I.D. x 1/16 in.	7/8 in. O.D. x 3/8 in. I.D. x 1/16 in.
6	12	Cadium plated lock washer	3/8 in.	3/8 in.
7	12	Cadium plated washer	1 3/8 in. O.D. x 9/16 in. I.D. x 3/32 in.	1 3/8 in. O.D. x 9/16 in. I.D. x 3/32 in.
8	4	Neoprene or Spring Isolator	Reference appropriate table below for replacement Isolator(s)	

ISOLATOR DETAIL
NOT TO SCALE



DUCT SUPPORT DETAIL
NOT TO SCALE



WALL MOUNT FAN DETAIL
NOT TO SCALE

Code	Quan	Item	Description
			Hood Package
	1	Model NDF 48 Wall Mounted Exhaust w/ External Front Plenum	

U.L. Listed Range hood w/ make-up air. Constructed of 18ga. polished stainless steel. Complete with Stainless Steel baffle filters,incandescent lights, full length make-up air plenum.

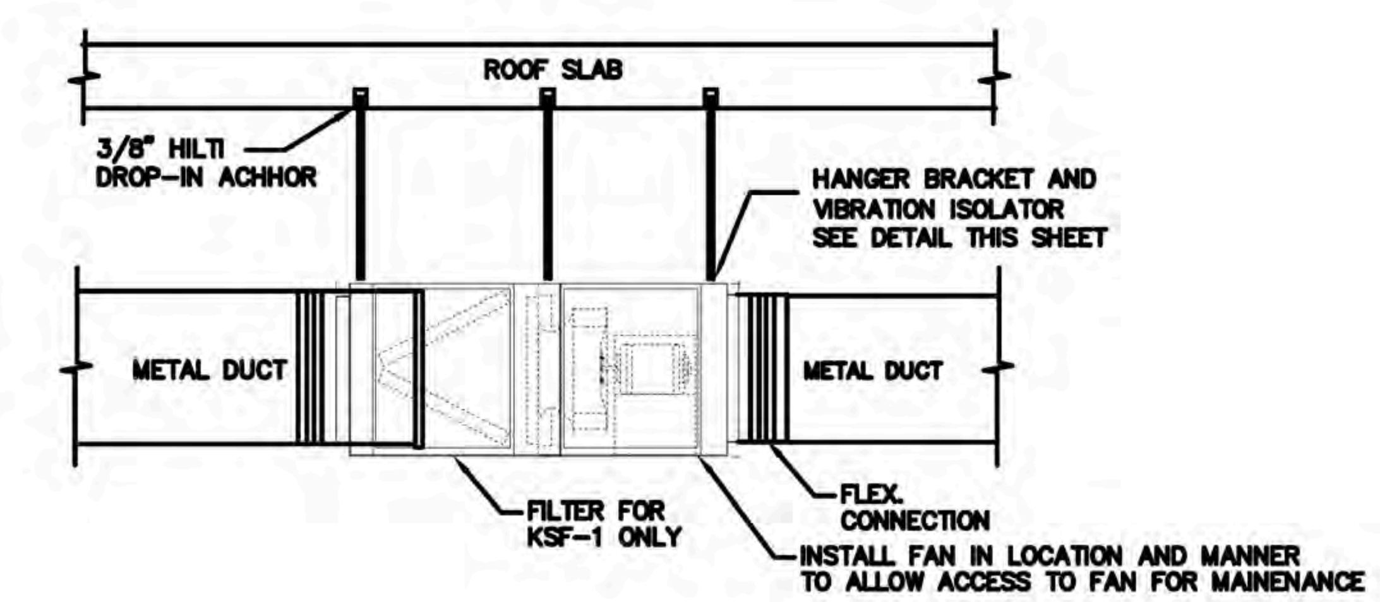
Usage-Medium, Exhaust CFM-1380, M.U.A. CFM-1104
6 ft long x 48 in wide x 24 in high

Code	Quan	Item	Description
	1	Model BFR. (1) Tank w/ Field Hook-Up, Pre-Pipe and Cabinet	

Fire Suppression System. Includes s/s integrated cabinet, factory installed piping in hood, system cylinder, gas valve, remote pull, nozzles,local permit, field hook-up and inspection. Continental US only. Union labor not included Permit fees by client.

Exhaust CFM-0, M.U.A. CFM-0

COMMERCIAL HOOD SPECIFICATION
NOT TO SCALE



IN LINE FAN DETAIL
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MECHANICAL DETAILS

100% O/A AIR CONDITIONING SPLIT SYSTEM SCHEDULE

CONDENSING UNIT (HEAT PUMP)

CU TAG	MANUFACTURER & MODEL	NOMINAL TONNAGE	CAP. STAGES	(S)EER/IPLV	REFRIG./LBS	LIQ./SUCT.	NO. FANS	FAN FLA(EA)	NO. COMP.	COMP.RLA(EA)	VOLTAGE/PH	MCA/MOCP	WEIGHT (LBS)	L x W x H (IN)	NOTES
CU-11	COOL US M1.OU.BB.1	8.0	2	13.0	–	–	–	–	1	–	208/3/60	48/60	750	–	SEE SPECIFICATION NOTES THIS SHEET

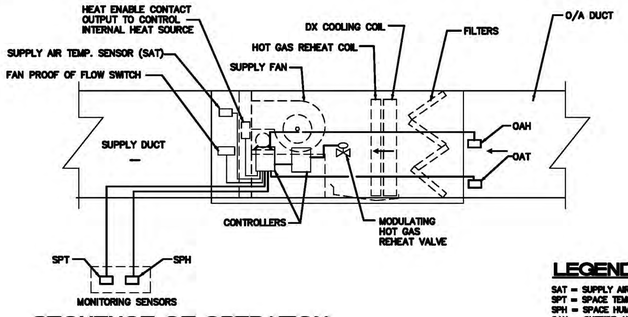
AIR HANDLING UNIT

AHU TAG	MANUFACTURER & MODEL	TOTAL MBH	SENSIBLE MBH	TOTAL CFM	O/A CFM	E.S.P.("W.G.)	ENT. DB/WB	LEAV. DB/WB	ROWS/FPI	FAN HP/FLA	HEATER KW	VOLTAGE/PH	MCA/MOCP	WEIGHT (LBS)	L x W x H (IN)	NOTES
AHU-11	COOL US M1.AH.BBB-10.V	84.8	37.5	1,200		.75	91/79	56/54	8/12	1/3.4	–	208/3/60	SEE BELOW	385	52X42X18	SEE SPECIFICATION NOTES THIS SHEET

COORDINATION NOTES:

INDOOR UNIT SHALL RECEIVE POWER FROM OUTDOOR UNIT

MECHANICAL CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS AND ACCESSORIES WITH ELECTRICAL CONTRACTOR PRIOR TO PURCHASING AND INSTALLATION AND SHALL BRING ANY DISCREPANCIES TO THE ATTENTION OF ENGINEER



LEGEND

SAT = SUPPLY AIR TEMPERATURE SENSOR
SPT = SPACE TEMPERATURE SENSOR
SPH = SPACE HUMIDITY SENSOR
OAH = OUTSIDE AIR HUMIDITY SENSOR
OAT = OUTSIDE TEMPERATURE SENSOR

SEQUENCE OF OPERATION

SET-BACK MODE

IN THIS MODE THE CONTROLLER WILL RESET THE HVAC UNIT COOLING, HEATING, DEHUMIDIFICATION MODES USER CONFIGURED.
THE MUA II CONTROLLER WILL REMAIN IN THE SET-BACK MODE OF OPERATION BASED ON A TIME SCHEDULE AS DETERMINED BY USER.

OCCUPIED MODE

COOLING MODE:

WHEN THE SPACE AIR TEMPERATURE RISES ABOVE THE COOLING SETPOINT, THE CONTROLLER WILL PLACE THE HVAC UNIT INTO THE COOLING MODE. THE SPACE COOLING SETPOINT SHALL BE MAINTAINED AT 74° (SPT) PLUS A COOLING DEADBAND OF A MAX OF 2°F. ONCE IN THE COOLING MODE, THE CONTROLLER WILL BRING ON THE HVAC UNIT COLLING STAGES TO MAINTAIN THE SPT AT ITS SETPOINT.

HEATING MODE:

WHEN THE SPACE AIR TEMPERATURE FALLS BELOW THE HEATING SETPOINT, (65°F,ADJUSTABLE)
THE CONTROLLER WILL PLACE THE HVAC UNIT INTO THE HEATING MODE. THE HEATING SETPOINT WILL MAINTAIN HEATING DEADBAND OF 2°F.
ONCE IN THE HEATING MODE, THE CONTROLLER WILL CLOSE A CONTACT TO ENABLE THE HEATER TO MAINTAIN THE SPT AT ITS SETPOINT.

DEHUMIDIFICATION MODE:

REGARDLESS OF SPACE TEMPERATURE, WHENEVER THE SPACE (SPH) HUMIDITY LEVEL RISES ABOVE THE (SPH) SETPOINT.
THE CONTROLLER WILL PLACE THE HVAC UNIT INTO DEHUMIDIFICATION MODE. ONCE IN THE DEHUMIDIFICATION MODE,
THE CONTROLLER WILL BRING ON HVAC UNIT COOLING STAGES BASED ON THE CALCULATED OUTDOOR AIR ENTHALPY
IN REFERENCE TO THE OUTDOOR AIR ENTHALPY SETPOINT AND OUTDOOR AIR ENTHALPY DEADBANDS.

REHEAT CONTROL:

DURING DEHUMIDIFICATION MODE THE REHEAT CONTROL WILL BE ACTIVATED TO MAINTAIN THE SPT SETPOINT.
THE CONTROLLER WILL MODULATE HOT GAS REHEAT VALVE TO CONTROL THE HVAC UNIT TO MAINTAIN THE SPT SETPOINT

THE SYSTEM CONTROLLER:

SHALL BE CAPABLE TO BE PROGRAMMED FOR A SEVEN DAY PERIOD WITH NIGHT SET-BACK MODE, WORKDAY AND WEEKEND SCHEDULE.
ALL SETPOINTS SHALL BE FIELD ADJUSTABLE TO ALLOW FOR TWO SETS OF SPACE CONDITIONS DEPENDING ON THE TYPE OF SPACE ACTIVITY.

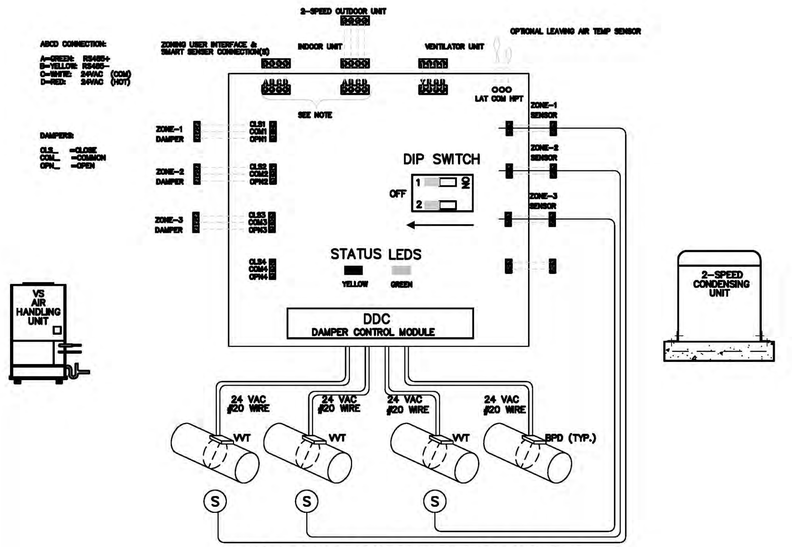
MECHANICAL CONTROL DIAGRAM FOR 100% O/A UNIT

Specification Notes for 100% O.A SPLIT SYSTEM

Provide the following features:

1. Basis of dLISTesign is COOL US; acceptable alternate manufacturers are Addison, Munters Dectron, DesChamps, and Desert Aire. Any alternate manufacturer must provide ALL of the features listed below. The contractor is responsible for coordinating all dimensional, weight and electrical changes.
2. Unit shall be UL or ETL listed and labeled by the final point of manufacture or modification. If the contractor supplies a unit in violation to this, they will be responsible to have each individual unit field inspected and labeled by UL at no cost to the owner.
3. Provide G90 galvanized steel and the unit exterior coated to exceed the 2,000 hour salt spray test in accordance with ASTM B 117-95 procedures. If the manufacturer's coating process does not meet this requirement, the contractor shall have the entire cabinet coated with Adeil.
4. Provide the interior cabinet with a minimum of 1" 1.5# black mat insulation.
5. The unit shall have Scroll Compressors with independent refrigerant circuits. Refrigerant circuits shall include liquid line filter driers, TXV, crankcase heaters, high and low pressure cutouts and Schrader service fittings on the high and low pressure sides of the system.
6. Provide single point power connection with phase and brown out protection.
7. Provide a factory mounted and wired molded case disconnect switch.
8. Provide a factory installed and field wired 115V, 15 amp GFI outlet
9. Provide time clock control and motor overload and thermal protection.
10. Provide a 2" filter rack and 30% pleated filters.
11. Provide a double sloped and pitched – 304 stainless steel drain pan under the cooling coil.
12. Provide a cooling coil with a MINIMUM of 6-rows for dehumidification.
13. Provide hot gas by-pass & Modulating hot gas reheat coil – factory mounted, piped and tested.
14. Provide controllable Modulating hot gas reheat with space temperature reset of the discharge set-point.
15. Provide an electric heating coil with 2-step control, fuses and resetable high temperature limit switch
16. Provide forward curved (FC) fans supplied by the manufacturer shall have fan wheel and assembly coated with adeil or baked phenolic.
The FC wheel will be rebalanced after the coating process as required.
17. Provide copper tube / aluminum finned condenser coils with baked phenolic or Adeil coating
18. Provide a factory five year compressor parts warranty.
19. Provide a Unit Controller with a programmable 365 day scheduler and holiday scheduling stored in a non-volatile EPROM memory. The controller must contain logic for cooling, heating and dehumidification. Controller shall be mounted in the designated area. Contractor shall coordinate final Controller location w/ owner prior final installation.
20. Provide dehumidification control that stages the compressors based on outside air enthalpy and supplies discharge air based on supply air temperature (adjustable modulating hot gas reheat). The supply air set-point will automatically be reset based on a space temperature reset sensor.
21. Provide service clearances per manufacturer's recommendations.
22. Provide time clock control and motor overload and thermal protection.

SPECIFICATIONS FOR 100% O/A UNIT



COORDINATE WITH FLOOR PLAN EXACT NUMBER AND LOCATION OF VVT BOXES

ZONING SYSTEM WIRING DIAGRAM (3 ZONES)
SYSTEM WIRING

VAV SYSTEM CONTROL DIAGRAM

SCALE: NTS

SET-BACK MODE

IN THIS MODE THE CONTROLLER WILL RESET THE HVAC UNIT COOLING AND HEATING SETPOINTS TO SET-BACK TEMPERATURE (USER DEFINED)
THE AHU FANS AND COOLING SHALL CYCLE TO MAINTAIN SET-BACK TEMPERATURE.

OCCUPIED MODE

FAN:

IN THE OCCUPIED MODE, THE AHU FAN SHALL RUN CONINUOUSLY.

COOLING MODE:

WHEN ANY ONE OF THE SPACE TEMPERATURE SENSORS REQUIRES COOLING, THE CONDENSING UNIT SHALL START THE COMPRESSOR.
THE VARIABLE SPEED COMPRESSOR SHALL ADJUST CAPACITY BASED ON THE NUMBER OF VAV UNITS CALLING FOR COOLING AND SHALL MAINTAIN SUPPLY AIR TEMPERATURE AT 55 F.

VAV BOXES

VAV BOX CONTROLLER:

THE VAV BOX AIR VALVE SHALL MODULATE THE AMOUNT OF AIR SUPPLIED TO THE SPACE TO MAINTAIN SPACE TEMPERATURE.
IF SPACE TEMPERATURE RISES ABOVE SETPOINT, THE VAV BOX DAMPER SHALL OPEN. AS THE SPACE TEMPERATURE DROPS BELOW SETPOINT
THE VAV BOX DAMPER SHALL CLOSE TO ITS MINIMUM SETPOINT POSITION. ON A FURTHER DROP IN SPACE TEMPERATURE TO THE HEATING
SETPOINT, THE VAV BOX HEATER SHALL ENERGIZE.

VAV BY-PASS DAMPER:

IF THE AIR OF THE AHU DROPS BELOW THE MINIMUM SETPOINT, THE BY-PASS DAMPER SHALL MODULATE OPEN.

SEQUENCE OF OPERATION FOR AHU-9

SET-BACK MODE

IN THIS MODE THE CONTROLLER WILL RESET THE HVAC UNIT COOLING AND HEATING SETPOINTS TO SET-BACK TEMPERATURE (USER DEFINED)
THE AHU FANS AND COOLING SHALL CYCLE TO MAINTAIN SET-BACK TEMPERATURE.

OCCUPIED MODE

FAN:

IN THE OCCUPIED MODE, THE AHU FAN SHALL RUN CONINUOUSLY.

COOLING MODE:

WHEN THE SPACE TEMPERATURE RISES ABOVE THE THERMOSTAT COOLING SETPOINT, THE CONDENSING UNIT SHALL START THE COMPRESSOR.
THE 2 SPEED COMPRESSOR SHALL ADJUST CAPACITY BASED COOLING DEMAND.

HEATING MODE:

WHEN THE SPACE TEMPERATURE DROPS BELOW THE THERMOSTAT HEATING SETPOINT, THE CONDENSING UNIT SHALL BE OFF AND THE ELECTRIC HEATER IN THE AHU SHALL ENERGIZE.

SEQUENCE OF OPERATION FOR AHU-8 AND 10

ENERGY MANAGEMENT SYSTEM REQUIREMENTS

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MECHANICAL SCHEDULE AND DETAILS