

SECTION 15500 - HEATING, VENTILATION AND AIR CONDITIONING

HVAC GENERAL NOTES

HVAC ABBREVIATIONS

HVAC SYMBOLS LEGEND

INTERPLANS

GENERAL

1. DESCRIPTION OF THE WORK:
 A. THE EXTENT OF THE MECHANICAL WORK IS INDICATED ON THE DRAWINGS OR IN THE BID MANUAL.
 B. RELATED WORK NOT INCLUDED IN THIS SECTION: TEST AND BALANCE, ELECTRICAL WIRING, CONTROL WIRING, ETC., EXCEPT CONTROL WIRING AS SPECIFICALLY DEFINED ABOVE. CONTRACTOR SHALL BE RESPONSIBLE FOR SUPERVISION OF ALL WIRING OF EQUIPMENT AND SHALL FURNISH ALL NECESSARY DIAGRAMS, INCLUDING CONTROL WIRING DIAGRAMS. MOUNT ALL CONTROL DEVICES.

2. SUBMITTALS
 A. MAINTENANCE MANUALS AND INSTRUCTIONS: FURNISH THREE (3) SETS OF COMPLETE OPERATING INSTRUCTIONS COVERING ENTIRE HEATING, VENTILATING AND AIR CONDITIONING SYSTEM. INCLUDE A COPY OF THE CONTROL DIAGRAMS AND A COMPLETE DESCRIPTION OF THE OPERATION OF THE CONTROL SYSTEM. INSTRUCT OWNER'S DESIGNATED REPRESENTATIVE AS TO PROPER OPERATION AND CARE OF SYSTEM.

3. REQUIREMENTS:
 A. NOISE AND VIBRATION: EQUIPMENT SHALL OPERATE QUIETLY AND THE DESIGN OF THE SUPPORTS SHALL BE SUCH THAT THE OPERATION OF THE EQUIPMENT SHALL CAUSE NO PERCEPTIBLE VIBRATION IN THE FLOORING ADJACENT TO THE EQUIPMENT, NOR CAUSE, DIRECTLY OR INDIRECTLY, VIBRATION OR OBJECTIONABLE NOISE IN ANY OTHER PORTION OF THE BUILDING AND/OR IN THE BUILDING STRUCTURE ITSELF.
 B. FOUNDATIONS: FURNISH ALL FOUNDATIONS FOR EQUIPMENT COVERED IN THE SPECIFICATIONS, AS A PART OF THIS SECTION, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

4. WARRANTY:
 A. FURNISH A FIVE (5) YEAR WARRANTY ON ALL COMPRESSORS AND A ONE (1) YEAR SERVICE AND GUARANTEE ON ALL CONTROLS, EQUIPMENT AND MATERIALS.

5. MECHANICAL SUBMITTALS:
 A. SUBMITTALS ARE REQUIRED ON THE FOLLOWING ITEMS AND THEY MUST BE SELECTED FROM ONE OF THE MANUFACTURERS LISTED:

1. FANS - BROAN (NEW)
2. GRILLES, REGISTERS & DIFFUSERS - PRICE, TITUS, AIR GUIDE OR METALARE.
3. FLEXIBLE DUCT & FITTINGS - GENFLEX, THERMAFLEX

PRODUCTS

1. LOW PRESSURE DUCTWORK
 A. SUPPLY & RETURN AIR DUCTWORK AS INDICATED ON SHEET SHALL BE EXTERNALLY INSULATED GALVANIZED SHEET METAL (FIBERGLASS NOT PERMITTED), GAUGES, REINFORCING AND JOINING CONNECTIONS SHALL BE IN STRICT ACCORDANCE WITH SMACNA LOW VELOCITY DUCT STANDARDS LATEST EDITION. ALL DUCTS WIDER THAN 18" SHALL BE CROSS BROKEN. PROVIDE ANGLE STIFFENERS AS REQUIRED TO AVOID DUCT VIBRATION. EXTERNAL INSULATION SHALL BE 2" THICK, 3/4 LB. DENSITY DUCT WRAP.
 B. ALL DUCT SIZES INDICATED ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS.
 C. ALL DUCTWORK TO BE HUNG WITH GALVANIZED STRAP HANGERS 24 GAUGE x 2" WITH A MAXIMUM SPACING OF 8'-0" O.C.
 D. ALL ELBOWS WILL BE SQUARE TURNS WITH DOUBLE VANE TURNING VANES EXCEPT WHERE SHOWN ON THE DRAWINGS.
 E. WHERE SHOWN ON THE DRAWINGS, PROVIDE VOLUME DAMPERS WITH LOCKING QUADRANTS OR SPLITTERS WITH HINGE AND ROD THROUGH SIDE OF DUCT WITH SET SCREW. VOLUME DAMPER HANDLES SHALL BE INSTALLED ON THE BOTTOM OF THE SPIN-IN FITTING AND SHALL HAVE RING SET IN FULL OPEN POSITION.
 F. ALL FLEXIBLE DUCTS SHALL BE SUPPORTED EVERY 4'-0" WITH 2" WIDE GALV. STEEL BANDS. MINIMUM ONE PER EACH SECTION OF FLEXIBLE DUCT.

2. MANUAL DAMPERS
 A. PROVIDE MANUAL LOUVER DAMPERS WHERE SHOWN ON THE PLANS AND WHERE NECESSARY FOR THE PROPER REGULATION OF THE AIR HANDLING SYSTEM, AND SO LOCATE AS TO BE ACCESSIBLE AFTER THE BUILDING IS COMPLETED, I.E. BY REMOVING A MARKED TILE, ACCESS PANEL OR OTHER APPROVED METHOD. DAMPERS SHALL BE AIR BALANCE NO. AC116.

3. EXHAUST FANS
 A. THIS CONTRACTOR SHALL INSTALL ALL EXHAUST FANS AS SCHEDULED ON THE CONTRACT DOCUMENTS.

4. CONTROLS
 A. PROVIDE ADJUSTABLE HEATING AND COOLING THERMOSTATS LOCATED IN THE MANAGERS OFFICE AND PROVIDE REMOTE TEMPERATURE SENSORS LOCATED WITHIN THE RESPECTIVE SPACE.

5. PIPING:
 A. CONDENSATE DRAIN LINES SHALL BE EACH 40 PVC.

6. SMOKE DETECTORS

A. SMOKE DETECTORS REQUIRED IN DUCTWORK SHALL BE IONIZATION TYPE AND LISTED BY UL OR FM FOR DUCT INSTALLATION. DUCT DETECTORS SHALL BE PROVIDED WITH AN APPROVED DUCT HOUSING, MOUNTED EXTERIOR TO THE DUCT, AND SHALL BE PROVIDED WITH PERFORATED SAMPLING TUBES EXTENDING ACROSS THE WIDTH OF THE DUCT. ALSO PROVIDE SMOKE DETECTORS WITH A REMOTE AUDIO/VISUAL LED LIGHT IN CEILING BELOW DETECTOR ALARM INDICATOR WITH KEY SWITCH FOR RESET. MOUNT 5' A.F.F. NEAR DUCT. ACTIVATION OF A DUCT DETECTOR SHALL CAUSE SHUTDOWN OF ITS RESPECTIVE AIR CONDITIONING UNIT. CONTROL AND INTERLOCK WIRING SHALL RUN IN CONDUIT WHICH SHALL BE SIZED TO SUIT THE NUMBER, TYPE AND SIZE OF CONDUCTORS, SHALL BE PROVIDED BY THE CONTROL CONTRACTOR. CONTROL AND INTERLOCK WIRING SHALL BE SEPARATE FROM POWER WIRING OF DIVISION 16. ALL WIRING SHALL BE IN ACCORDANCE WITH DIVISION 16. DUCT SMOKE DETECTOR SHALL BE WIRED AND INTERLOCKED WITH BUILDING FIRE ALARM SYSTEM. DUCT SMOKE DETECTORS SHALL BE SUPPLIED BY THE UNIT MANUFACTURER, AND WIRED BY THE ELECTRICAL CONTRACTOR.

B. THE REMOTE TEST/RESET ANNUNCIATORS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR AND INSTALLED BY THE MECHANICAL CONTRACTOR. INSTALLATION BY MECHANICAL SHALL INCLUDE MOUNTING OF THE ANNUNCIATORS AND ALL WIRING FROM EACH DEVICE TO THE RTU. ELECTRICAL WILL PROVIDE A JUNCTION BOX IN THE WALL WITH 1/2" CONDUIT STUBBED UP ABOVE THE CEILING FOR EACH.

7. GRILLES, REGISTERS AND DIFFUSERS:
 A. ALL SUPPLY, RETURN AND EXHAUST GRILLES SHALL BE OF ALUMINUM CONSTRUCTION OR AS SCHEDULED ON THE DRAWINGS.

8. FLEXIBLE DUCT:
 A. FLEXIBLE DUCT SHALL BE EQUIVALENT TO GENFLEX TYPE SLR-25 FLEX DUCT.
 B. FITTINGS SHALL BE EQUIVALENT TO GENFLEX SPIN COLLAR WITH SCOOP AND DAMPER, MODEL SM-1 DEL. ALL FITTINGS SHALL BE INSULATED.

EXECUTION

1. SUPERVISION OF ELECTRICAL WORK:
 A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR SUPERVISION OF ALL WIRING (INCLUDING CONTROL WIRING) OF EQUIPMENT INCLUDED IN THIS SECTION AND SHALL FURNISH ALL NECESSARY DIAGRAMS REQUIRED, INCLUDING CONTROL WIRING DIAGRAMS. MOUNT ALL CONTROL DEVICES.

2. PIPING, EQUIPMENT, INSTALLATION:
 A. ENTIRE INSTALLATION SHALL BE IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS AND APPLICABLE REQUIREMENTS OF THE MANUFACTURERS OF THE EQUIPMENT AND SHALL PERFORM SATISFACTORILY AT THE COMPLETION OF THE WORK.

3. PAINTING:
 A. EXCEPT AS SPECIFIED HEREIN, ALL PAINTING WILL BE DONE BY OTHERS. LEAVE WORK FREE FROM RUST, DIRT, GREASE AND PLASTER.
 B. EQUIPMENT WITH A FACTORY APPLIED FINISH SHALL HAVE SCRATCHES, CHIPS, ETC. PRIMED AND TOUCHED UP WITH MATERIALS WHICH WILL PROTECT THE SURFACE AND MATCH THE ADJACENT AREAS.

4. CLEANING AND ADJUSTMENTS:
 A. UPON COMPLETION OF WORK, CLEAN, OIL AND GREASE ALL FANS, MOTORS, OTHER RUNNING EQUIPMENT AND APPARATUS AND MAKE CERTAIN THAT ALL SUCH APPARATUS AND MECHANISMS ARE IN PROPER WORKING ORDER AND MADE READY FOR TEST.
 1. EXISTING EQUIPMENT, APPURTENANCES AND ASSOCIATED DUCTWORK PROPOSED FOR REUSE SHALL BE CLEANED, TESTED AND CALIBRATED BY THE HVAC CONTRACTOR. ANY DEFECTIVE PARTS SHALL BE REPLACED TO BRING UNITS UP TO GOOD OPERATING CONDITION. EXISTING THERMOSTATS SHALL BE REUSED AND/OR RELOCATED. EXISTING T'STATS SHALL ALSO BE CLEANED, TESTED, CALIBRATED AND REPAIRED AS NECESSARY FOR PROPER OPERATION.

5. TEST AND BALANCE:
 GENERAL
 A. BUILDING AIR SYSTEMS SHALL BE BALANCED PER DATA INDICATED ON DRAWINGS TO ACHIEVE RELATIVE AIR VOLUMES AS INDICATED ON THE DRAWINGS AND SCHEDULED HEREIN.

6. PERFORMANCE
 A. THE CONTRACTOR SHALL ENGAGE AN INDEPENDENT AIR BALANCING AGENCY SUBSEQUENT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE. THE T&B AGENCY CAN ONLY USE ITS OWN REPORTING AGENCY IF SUITABLE INSTRUMENTS HEREINAFTER REQUIRED ARE DEMONSTRATED TO BE PART OF HIS NORMAL PROCEDURE TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE. THE T&B AGENCY SHALL BE ABC OR NEBB CERTIFIED.

7. MEASURING TECHNIQUES

A. PIVOT TUBE TRAVERSE SHALL BE PERFORMED TO DETERMINE THE TOTAL FLOW OF ALL HVAC SYSTEMS.
 B. ALL DIFFUSERS, REGISTERS AND GRILLES WITH A FACE DIMENSION OF 24" OR LESS SHALL BE MEASURED BY UTILIZING A HOOD AXIAL VANE VELOMETER.
 C. USE VOLUME DAMPERS LOCATED IN DUCTS AND BALANCE DIFFUSERS.
 D. DUCT SMOKE DETECTORS SHALL ACTIVATE A VISIBLE AND AUDIBLE SIGNAL AT A NORMALLY OCCUPIED LOCATION AND SHALL BE MONITORED BY THE FACP AND REPORT AS A SUPERVISORY SIGNAL PER NFPA 72 AND THE 2006 IBC.
 E. DUCT SMOKE DETECTORS REQUIRE A REMOTE LED INDICATOR THRU THE CEILING LEVEL. NFPA 72 3-8.3 AND 5-10.6.8.
 F. DUCT SMOKE DETECTORS TO PROVIDE SHUT DOWN IN 30 SECONDS OR LESS.

8. SUBMITTALS
 A. IT SHALL BE THE RESPONSIBILITY OF THIS T&B AGENCY TO PROVIDE THE LOCAL BLDG. DEPT. AND OWNER WITH PROPER TEST & BALANCE DATA ON ABC OR NEBB FORMS.

9. ROOFTOP GENERAL

A. SPECIFICALLY DESIGNED FOR OUTDOOR ROOFTOP INSTALLATION ON A FULL ROOF COVERED COMPLETELY FACTORY ASSEMBLED AND TESTED, PIPED, INTERNALLY WIRED, FULLY CHARGED WITH REFRIGERANT, COMPRESSOR OIL AND SHIPPED IN ONE PIECE. UNITS AVAILABLE FOR DIRECT EXPANSION COOLING WITH GAS HEATING, FILTERS, OUTSIDE AIR SYSTEM, EXHAUST AIR SYSTEM, OPTIONAL NON-FUSED DISCONNECT SWITCHES AND ALL OPERATING AND SAFETY CONTROLS FURNISHED FACTORY INSTALLED. ALL UNITS FACTORY RUN TESTED. COOLING CAPACITY RATED IN ACCORDANCE WITH ARI STANDARD 360. UNITS AVAILABLE WITH UL APPROVAL. ALL UNITS HAVE DECALS AND TAGS TO AID IN SERVICE AND INDICATE CAUTION AREAS. ELECTRICAL DIAGRAMS ON LONG LIFE WATER RESISTANT MATERIAL SHIP ATTACHED TO CONTROL PANEL DOOR.

10. CASING

A. EXTERIOR PANELS HAVE A MINIMUM OF 1.25 OZ. ZINC COATING PER SQUARE FOOT OF STEEL, PHOSPHATIZED, AND FINISHED WITH SLATE GRAY WATER-BORN FINISH. SCREWS ARE COATED WITH ZINC-PLUS-ZINC CHROMATE. 18 GAUGE STEEL HINGED ACCESS PANELS WITH TIEBACKS TO SECURE DOOR IN OPEN POSITION PROVIDE ACCESS TO FILTERS AND HEATING SECTIONS. REFRIGERATION COMPONENTS, SUPPLY AIR FAN, AND COMPRESSOR ACCESSIBLE THROUGH REMOVABLE PANELS AS STANDARD. CONTROL PANEL ACCESSIBLE THROUGH HINGED ACCESS PANEL WITH QUICK RELEASE LATCHES. OPTIONAL HINGED ACCESS DOORS PROVIDE ACCESS TO FILTERS, RETURN/ EXHAUST AIR, HEATING AND SUPPLY FAN SECTION. ALL ACCESS PANELS AND DOORS HAVE NEOPRENE GASKETS. INTERIOR SURFACES OR EXTERIOR CASING MEMBERS HAVE 1/2" TUF-SKIN FIBERGLASS INSULATION. DRAINS PROVIDED ON EACH SIDE OF THE CONDENSER SECTION. UNITS BASE IS WATER-TIGHT WITH 14 GAUGE FORMED LOAD BEARING MEMBERS, FORMED RECESS AND CURB OVERHANG. UNIT LIFTING LUGS ACCEPT CHAINS OR CABLES FOR RIGGING. LIFTING LUGS CAN ALSO SERVE AS THE DOWN POINTS.

11. REFRIGERATION SYSTEM COMPRESSOR

A. HERMETIC RECIPROCATING COMPRESSOR DIRECT DRIVE, 1700 RPM, WITH ISOLATED MOUNTING INTEGRATING SUCTION ACCUMULATION, CENTRIFUGAL OIL PUMP, OIL FILTER, SCREEN AND MAGNETIC DISKS, OIL LEVEL SIGHT GLASS, OIL CHARGING VALVE, TWO POINT LUBRICATION FOR EACH BEARING CONNECTING ROD, CRANKCASE HEATER AND WELL, DOUBLE MESH SUCTION INLET SCREEN, HIGH STRENGTH NON-FLEXING RING TYPE SUCTION AND DISCHARGE VALVES, LARGE GAS PASSAGES AND MINIMUM CLEARANCE VOLUMES, ELECTRIC ACTUATED UNLOADING, REPLACEMENT UNLOADED SOLENOID VALVES, AND DISCHARGE SERVICE VALVE. MOTOR IS SUCTION GAS COOLED AND HAS VOLT UTILIZATION RANGE FROM 95% TO 100% OF NAMEPLATE VOLTS. TWO WINDING THERMOSTATS IMBEDDED BETWEEN THREE MOTOR WINDINGS PROTECT AGAINST EXCESSIVE TEMPERATURES. SAFETY CONTROLS INCLUDE HIGH AND LOW PRESSURE CUTOUPS AND REVERSE RELAY. AN OPTIONAL FACTORY INSTALLED COMPRESSOR LOCKOUT THERMOSTAT PREVENTS COMPRESSOR OPERATION AT LOW AMBIENT CONDITIONS.

EVAPORATOR COIL

A. INTERNALLY ENHANCED SEAMLESS COPPER TUBING OF 1/2" O.D. MECHANICALLY BONDED TO HEAVY DUTY ALUMINUM FINS OF CONFIGURED DESIGN. ALL COILS ARE DUAL CIRCUITED WITH INDEPENDENT THERMAL EXPANSION VALVES. FACTORY PRESSURE AND LEAK TESTED AT 300 PSI.

13. CONDENSER COIL

A. CONFIGURED ALUMINUM FIN SECONDARY SURFACE MECHANICALLY BONDED TO PRIMARY SURFACE OF 3/8" O.D. SEAMLESS COPPER TUBING. SUB COOLING CIRCUIT(S) WITH LIQUID ACCUMULATOR(S) STANDARD. FACTORY TESTED AT 450 PSIG AIR PRESSURE. VACUUM DEHYDRATED, CONFIGURED COPPER FINS OPTIONAL AS SECONDARY SURFACE FOR EXTRA CORROSION RESISTANCE.

14. CONDENSER FANS AND MOTORS

A. VERTICAL DISCHARGE, DIRECT DRIVE FANS, STATICALLY BALANCED, WITH STEEL BLADES AND ZINC PLATED STEEL HUBS. THREE-PHASE MOTORS WITH PERMANENTLY LUBRICATED BALL BEARINGS, BUILT-IN CURRENT AND THERMAL OVERLOAD PROTECTION, AND WEATHER TIGHT SLINGERS OVER BEARINGS. OPTIONAL TOTALLY ENCLOSED CONDENSER FAN MOTORS ARE ALSO AVAILABLE.

1. ALL DRAWINGS ARE CONCEPTUAL AND SCHEMATIC AND ARE INTENDED FOR USE AS A DESIGN/BUILD GUIDELINE. THE CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL FIELD CONDITIONS AND ADJUSTING OR MODIFYING THE SPECIFIC ELEMENTS OF THEIR WORK AS REQUIRED TO MEET THE DESIGN INTENT. THE CONTRACTORS ARE RESPONSIBLE FOR THE FOLLOWING:
 A. COORDINATION WITH OTHER TRADES.
 B. PROVIDING ADDITIONAL DRAWINGS, CALCULATIONS AND OTHER DOCUMENTATION REQUIRED FOR THE BUILDING DEPARTMENT. THE MECHANICAL CONTRACTOR SHALL DOCUMENT THE INSTALLATION AND PROVIDE ALL TESTS REQUIRED TO SUBSTANTIATE CODE COMPLIANCE AS REQUIRED BY THE BUILDING DEPARTMENT AND LOCAL INSPECTOR. CONTRACTOR SHALL SUBMIT FINAL AS-BUILT DRAWINGS TO BUILDING DEPARTMENT FOR RECORD AT COMPLETION.

2. MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE, NOT SHOWING EVERY ITEM IN EXACT LOCATION OR DETAIL. MEASUREMENTS AND LOCATIONS MUST BE FIELD VERIFIED AND COORDINATED WITH ARCHITECTURAL, HVAC, FIRE, PROTECTION, STRUCTURAL, ELECTRICAL AND OTHER BUILDING DRAWINGS.

3. FURNISH ALL LABOR, MATERIALS, TOOLS, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE A COMPLETE HEATING, VENTILATING, AIR CONDITIONING SYSTEM. INCLUDE ANY LABOR AND MATERIAL NOT SPECIFICALLY MENTIONED, BUT NECESSARY TO PROVIDE A COMPLETE AND OPERATING SYSTEM. ALL WORK SHALL BE INSTALLED IN A PROFESSIONAL MANNER AND SHALL MEET ALL THE REQUIREMENTS OF THE STATE BUILDING CODE, CITY BUILDING CODE, SAFETY AND HEALTH CODES, NFPA CODES AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. ALL COSTS FOR SAID REQUIREMENTS SHALL BE INCLUDED IN THIS CONTRACTORS BID PRICE.

4. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE FOLLOWING CODES:
 2017 FLORIDA BUILDING CODE
 2017 MECHANICAL CODE
 2017 FLORIDA ENERGY CONSERVATION CODE

5. CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND INSPECTIONS AND PERFORM ALL TESTS CALLED FOR OR REQUIRED AS A PART OF THIS WORK. FURNISHED APPROVED CERTIFICATE OF FINAL INSPECTION, AND TURN OVER TO OWNER AT COMPLETION OF PROJECT.

6. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL TRADES, OWNER REQUIREMENTS, CEILING HEIGHTS AND STRUCTURAL CONDITIONS PRIOR TO FABRICATION OF ANY DUCTWORK OR ORDERING OF ANY EQUIPMENT.

7. ALL INSTALLATION OF THE MECHANICAL EQUIPMENT SHALL COMPLY WITH THE MANUFACTURER'S SPECIFICATION AND CLEARANCE REQUIREMENTS.

8. ALL HVAC WORK SHALL BE IN ACCORDANCE WITH NFPA 90A, 90B, 96, 94 AND NEC 101, LIFE SAFETY CODE.

9. INSTALLATION SHALL COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODES, AND WITH THE ASHRAE RECOMMENDATIONS. WORK SHALL BE IN ACCORDANCE WITH THE ASHRAE RECOMMENDATIONS TO BUILDING STANDARDS.

10. CONTRACTOR SHALL FURNISH AND INSTALL COMPLETE HEATING AND CONTROL SYSTEM TO INCLUDE: RELAYS, MODULES, RELAYS, WIRING, THERMOSTATS, SENSORS, DAMPERS, MOTORS AND ALL MISCELLANEOUS ITEMS AS REQUIRED BY THE PLANS AND DESIGN INTENT AS INDICATED ON THE PLANS AND GENERAL NOTES. THERMOSTATS AND SENSORS SHALL BE FIELD GENERALLY AS SHOWN BUT THE EXACT LOCATION SHALL BE FIELD COORDINATED TO AVOID INTERFERENCE WITH WALL MOUNTED WORK.

11. ALL CONTROL WIRING, CONDUIT, AND HARDWARE TO COMPLETE THE HVAC CONTROL SYSTEMS SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR UNDER DIVISION 15 OF THE SPECIFICATIONS.

12. DURING THE BIDDING PERIOD, EACH CONTRACTOR SHALL VISIT THE SITE TO DETERMINE CONDITIONS AFFECTING THE WORK. BIDS SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY IN PERFORMANCE OF WORK REQUIRED CONDITIONS IN EVIDENCE THEREBY SHALL NOT BE JUSTIFICATION FOR ADDITIONAL COMPENSATION.

13. THE EQUIPMENT SHALL BE LOCATED TO ALLOW FOR EASY ACCESS FOR SERVICING, ADJUSTING OR MAINTENANCE AND SPACE FOR REMOVAL OF INTERNAL ASSEMBLIES. PROVIDE MINIMUM CLEARANCES FOR ALL EQUIPMENT PER THE MANUFACTURERS RECOMMENDATIONS.

14. PROVIDE ALL CONTROL EQUIPMENT, MOTOR STARTERS, RELAYS, LINE VOLTAGE CONTROLS, TRANSFORMERS, LOW VOLTAGE CONTROLS, AND DEVICES NECESSARY FOR THE COMPLETE OPERATION OF THE HEATING AND AIR CONDITIONING AND VENTILATING SYSTEM.

15. ALL LOW VOLTAGE WIRING AND CONDUIT REQUIRED FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.

16. SMOKE DETECTORS WIRED BY DIVISION 16.

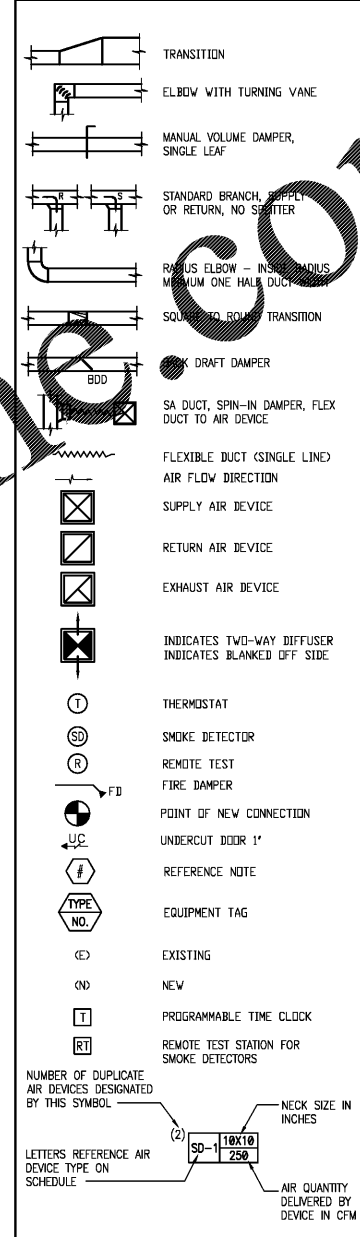
17. PROVIDE ALL FANS AND ROOFTOP UNITS WITH RELAYS TO SHUT DOWN WHEN FIRE ALARM IS INITIATED. COORDINATE LOCATION WITH THE ELECTRICAL CONTRACTOR FOR THE FIRE ALARM WIRING.

18. IN THE EVENT OF FAN SHUT DOWN, ALL DUCT MOUNTED DETECTORS SHALL REMAIN IN OPERATION.

19. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND ORDINANCES AND THE NATIONAL ELECTRIC CODE.

21. ALL THE BARE METAL SURFACES SHALL BE PRIMED AND PAINTED TO PREVENT ANY RUST, INCLUDING, BUT NOT LIMITED TO, ANGLE FRAMING, UNIT SUPPORTS, MOUNTING HARDWARE, ETC.
 22. CONTRACTOR TO PROVIDE TENANT WITH AS-BUILT DRAWINGS OF ALL CHANGES OR MODIFICATIONS MADE IN THE FIELD, TO THE ORIGINAL SET OF CONSTRUCTION DOCUMENTS, FOR TURN-OVER TO THE ARCHITECT/ ENGINEER UPON COMPLETION OF THE PROJECT. PROVIDE ALL EQUIPMENT SHOP DRAWINGS, INFORMATION ON CONTROL DEVICES, CONTROL WIRING DIAGRAMS AND OTHER PERTINENT INFORMATION AT COMPLETION OF PROJECT.
 23. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE MECHANICAL EQUIPMENT COMPONENTS ARE INSTALLED AT LOCATIONS AND ELEVATIONS WHICH MAKE THEM READILY ACCESSIBLE FOR ROUTINE MAINTENANCE WITHOUT REQUIRING ANY EXTRAORDINARY MEASURES.
 24. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ADMINISTERING ALL WARRANTIES ON EQUIPMENT WHICH HE INSTALLS. THIS INCLUDES ALL CONDENSERS, REFRIGERANT PIPES, AND OTHER ITEMS FURNISHED BY OTHERS AS WELL AS THOSE FURNISHED BY HIM.
 25. CONDENSATE DRAINAGE PIPING FROM RTU'S SHALL BE TRAPPED, SUPPORTED AND RUN AS SHOWN ON DRAWINGS.
 26. FIELD VERIFY THE EXACT LOCATION OF ALL EQUIPMENT WITH ARCHITECT/OWNER PRIOR TO INSTALLATION. INFORM OWNER OF ANY EQUIPMENT ITEMS THAT REQUIRE RELOCATION.
 27. CONTRACTOR SHALL VERIFY THAT ALL EQUIPMENT, AS SHOWN ON THESE DRAWINGS, WILL NOT CONFLICT WITH ANY DRAINS, VENTS, MECH. PIPING OF ANY KIND, ELECTRICAL, ETC.
 28. PROVIDE VIBRATION ISOLATION DEVICES AND FLEXIBLE CONNECTIONS TO ALL MOVING MACHINERY.
 29. DUCT DIMENSIONS SHOWN ARE INSIDE NET DIMENSIONS. ADD TO SHEET METAL SIZE FOR INSULATION THICKNESS. HOLD DUCTWORK TIGHT TO UNDERSIDE OF STRUCTURE. UNLESS OTHERWISE NOTED OR REQUIRED BY FIELD CONDITIONS. IT IS REQUIRED TO COORDINATE EXACT MOUNTING HEIGHT IN FIELD WITH ARCHITECT/ INVESTIGATION. SUPPLY RETURN, OUTSIDE AIR, OUTDOOR AIR, SHALL BE EXTERNALLY INSULATED. INSULATION SHALL BE SEALED WITH FAB AND MASTIC.
 30. ALL DUCTWORK SHALL MAINTAIN SYSTEM PRESSURE. THE AIR DISTRIBUTION COMPONENTS SHALL BE SECTORED IN ACCORDANCE WITH SMACNA REQUIREMENTS. THE AIR SHALL BE INSULATED WITH MASTIC.
 31. ALL EXTERIOR AIR DUCTWORK SHALL BE A MINIMUM 24 GA. GALV. SHEET METAL DUCTWORK. DUCTWORK IS NOT PERMITTED TO BE FIELD WELDED.
 32. INSULATION CLEANING SYSTEM SHALL CONSIST OF GLOVES, MASKS AND NON-MIGRATING MASTIC, SEAL AIR TIGHT.
 33. ALL FLEXIBLE DUCTS SHALL BE SUPPORTED EVERY 4'-0" WITH 2" WIDE GALV. STEEL BANDS. MINIMUM ONE PER EACH SECTION OF FLEXIBLE DUCT. MAXIMUM LENGTH OF FLEX DUCT SHALL BE 5'-0" LONG AND SHALL MEET INSTALLATION AND MATERIAL REQUIREMENTS OF LOCAL CODES.
 34. NO FLEXIBLE DUCTS SHALL PASS THROUGH FIRE WALLS, OR BE CONNECTED TO ANY METAL DUCT WITH-IN 5'-0" FROM EITHER SIDE OF THE FIREWALL.
 35. ALL BRANCH TAKE-OFFS SHALL BE PROVIDED WITH MANUAL BALANCING DAMPERS LOCATED ABOVE ACCESSIBLE CEILING AS CLOSE TO MAIN TRUNK AS POSSIBLE.
 36. CONTRACTOR IS RESPONSIBLE FOR COORDINATING BOX-OUT LOCATIONS FOR ALL DRYWALL MOUNTED AIR DEVICES WITH GENERAL CONTRACTOR AND CEILING FRAMING. CONTRACTOR SHALL COORDINATE ALL DUCT AND DIFFUSER LOCATIONS WITH LIGHTING LAYOUTS AS REQUIRED.
 37. ALL DUCTWORK BEHIND RETURN AIR PLENUMS SHALL BE PAINTED FLAT BLACK.
 38. ALL SUPPLY DUCT BENDS FROM THE VERTICAL TO HORIZONTAL AND ANGLED TURNS OF DUCTWORK SHALL HAVE TURNING VANES INSTALLED.
 39. PROVIDE SMOOTH TRANSITIONS AT EQUIPMENT AND AIR DEVICES TO MATCH CONNECTION SIZES. ALL DUCTWORK SHALL BE SHEET METAL FABRICATED IN ACCORDANCE WITH ASHRAE GUIDE AND SMACNA MANUAL LATEST EDITIONS.
 40. THE CONTRACTOR SHALL ENGAGE AN INDEPENDENT AIR BALANCING AGENCY SUBSEQUENT TO THE APPROVAL OF THE OWNERS REPRESENTATIVE. THE T&B AGENCY CAN ONLY ACT AS HIS OWN REPORTING AGENCY IF SUITABLE INSTRUMENTS HEREINAFTER REQUIRED ARE DEMONSTRATED TO BE PART OF HIS NORMAL PROCEDURE TO THE SATISFACTION OF THE OWNERS REPRESENTATIVE. THE T&B AGENCY SHALL BE ABC OR NEBB CERTIFIED. CONTRACTOR SHALL PROVIDE LANDLORD WITH WATER AND AIR BALANCE REPORT.
 41. IT SHALL BE THE RESPONSIBILITY OF THIS T&B AGENCY TO PROVIDE THE LOCAL BLDG. DEPT. AND OWNER WITH PROPER TEST & BALANCE DATA ON ABC OR NEBB FORMS.
 42. BUILDING AIR SYSTEMS SHALL BE BALANCED PER DATA INCLUDED ON THE DRAWINGS TO ACHIEVE RELATIVE AIR VOLUMES AS INDICATED ON THE DRAWINGS AND SCHEDULED HEREIN.
 43. BOTH OUTDOOR AIR SUPPLY AND EXHAUST DUCTS SHALL BE EQUIPPED WITH DAMPERS THAT WILL AUTOMATICALLY SHUT WHEN SYSTEMS OR SPACES SERVED ARE NOT IN USE.

A	AMPS
AFF	ABOVE FINISHED FLOOR
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
DIA	DIAMETER
EF	EXHAUST FAN
RTU	EXISTING ROOF TOP UNIT FAN
ESP	EXTERNAL STATIC PRESSURE
°F	DEGREE FAHRENHEIT
FT	FOOT OR FEET
HP	HORSEPOWER
KWH	KILOWATT
HZ	HERTZ
IN	INCH
MAX	MAXIMUM
MBH	1,000 BTU'S PER HOUR
MCA	MAXIMUM CIRCUIT AMPACITY
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
N T S	NOT TO SCALE
OA	OUTSIDE AIR
PH	PHASE
RLA	RUNNING LOAD AMPS
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SO. FT.	SQUARE FEET
T	THERMOSTAT



FIELD VERIFY ALL CONDITIONS

NOTE: AS NOTED IN THE SPECIFICATIONS, ALL WIRING LAYOUTS, PIPING LAYOUTS AND DUCT LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONSTRUCTION AND STRUCTURE OF THE BUILDING AND SHALL BE VERIFIED AND COORDINATED IN THE FIELD. EACH TRADE CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THAT HE HAS THOROUGHLY REVIEWED AND COORDINATED ALL LOCATIONS AND ROUTINGS WITH ALL OTHER TRADES PRIOR TO FABRICATION OF CONDUITS, DUCTS, OR PIPING, AND START OF INSTALLATION OF SAME (INCLUDING SPRINKLER PIPING WHEN PRESENT ON JOB). ANY INSTALLATION OR CONSTRUCTION CONFLICTS WHICH OCCUR IN THE FIELD SHALL BE RESOLVED BY THE TRADE CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ARCHITECT AND AT NO EXPENSE TO THE OWNER, ARCHITECT AND/OR GENERAL CONTRACTOR.
 THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.
 BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

ARCHITECTURE
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 INTERIOR DESIGN
 PROJECT MANAGEMENT
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SEAL:
 THIS DOCUMENT IS NOT FOR CONSTRUCTION
 UNLESS THE ARCHITECT OR ENGINEER'S
 SIGNATURE AND SEAL APPEAR BELOW

04.04.18 PERMIT SUBMIT
 03.26.18 OWNER REVIEW
 03.23.18 OWNER REVIEW
 NO DATE REMARKS
 REVISIONS

SHERWIN
 WILLIAMS
 8909 IMMOKALEE ROAD
 NAPLES, FL 34120

PROJECT NO: 2018.0102
 DATE: 03.19.18

MOO1
 MECHANICAL SPECS
 NOTES AND LEGENDS
 CHECKED: AS DRAWN: AC

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