## A. CODES & REFERENCES

- FLORIDA BUILDING CODE 2010 (WITH AMENDMENTS).
- SMACNA
- NFPA 101

NFPA 99

- 4. NFPA 90A
- B. SCOPE OF WORK
- 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:
- REMOVAL, RELOCATION AND RE-INSTALLATION OF EXISTING EQUIPMENT AND SYSTEM.
- b. CONNECTIONS TO EXISTING OR NEW EQUIPMENT AND SYSTEMS.
- CUTTING AND PATCHING TO REMOVE EXISTING OR INSTALL NEW WORK.
- CLEANING AND TESTING.
- 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
- 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
- INSULATION.
- AIR DEVICES. DUCTWORK COORDINATION DRAWINGS.
- CONTROLS.
- ROOF TOP UNITS
- THERMOSTATS.
- 7. FANS.
- 8. FILTERS

### D. MAINTENANCE MANUALS

- 1. PROVIDE MAINTENANCE MANUALS FOR ALL NEW EQUIPMENT CONTAINING ALL OPERATING AND MAINTENANCE DATA, SUBMITTALS, WARRANTEES, DIAGRAMS, AHRI CERTIFICATES, INSPECTION REPORTS AND VALVE LISTS IN A 3 RING BINDER WITH POCKETS FOR DRAWINGS. PROVIDE OWNER WITH 2 COPIES.
- 2. PROVIDE AN INDEX INSIDE THE BINDER COVER WITH A LIST OF EACH EQUIPMENT ITEM.
- EACH ITEM SHALL BE INDIVIDUALLY TABBED. 3. PROVIDE A LIST OF ALL REQUIRED REGULAR MAINTENANCE ACTIONS.
- 4. MAINTENANCE LIST SHALL REFERENCE TABULATED ITEM AND SHALL INCLUDE THE TITLE OR PUBLICATION NUMBER FOR THE OPERATION AND MAINTENANCE MANUAL FOR THAT PARTICULAR MODEL AND TYPE OF PRODUCT.
- 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
- 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
- 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.

# 15050 - BASIC MATERIALS AND METHODS

- A. ACCESS PANELS FURNISHED BY MECHANICAL CONTRACTOR, INSTALLED BY GENERAL CONTRACTOR.
- 1. PROVIDE FOR ACCESS TO ALL SERVICEABLE EQUIPMENT IN WALLS AND CEILINGS.
- MICOR STYLE M FOR DRYWALL. 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.
- 2. PAINT ALL MECHANICAL PIPING IN EQUIPMENT ROOMS. BOILER ROOMS AND WHERE EXPOSED OR OUTDOORS. MATCH EXISTING COLOR CODES USED ON SIMILAR SYSTEMS.
- C. FLASHING AND COUNTER FLASHING
- 1. FURNISH MATERIALS AND COORDINATE INSTALLATION FOR ALL PENETRATIONS OF ROOF BY ALL DUCT AND PIPE.
- 2. SHEET METAL 24ga. ASTM A525.
- 3. SHEET LEAD 6 lbs PER SQ. FT. (WHERE ALLOWED)
- 4. STAINLESS STEEL 20 ga.

- D. MECHANICAL SYSTEMS CLEANING
- 1. CLEAN AND TOUCH UP ALL FACTORY FINISHES
- FLUSH ALL HVAC SYSTEMS BEFORE CONNECTION TO EQUIPMENT.
- E. CLEANING TESTING AND ADJUSTING
- 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.
- F. 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
- G. 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.
- 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.

#### 15103 - SLEEVES

- A. SLEEVES TO BE 18 GAGE SHEET METAL OR SCHEDULE 40 PIPE. SLEEVE THE FOLLOWING:
- 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. FIRE RATED DRY WALL PARTITIONS SLEEVE
- 4. NON-FIRE RATED PARTITIONS NO SLEEVES REQUIRED. SEAL WALL TO INSULATION. 5. USE U.L. LISTED ASSEMBLY FOR ALL PENETRATIONS THRU RATED CONSTRUCTION.

## 15242 - VIBRATION ISOLATION

- A. ACCEPTABLE MANUFACTURERS:
- MASON INDUSTRIES. KINETICS NOISE CONTROL.
- KORFUND. AMBER BOOTH.
- B. MASON TYPE SLF CONTROL AIR COMPRESSOR
- MASON TYPE HS CEILING SUSPENDED FANS

# 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
- FIBERGLASS PIPE INSULATION, JOHNS MANVILLE MICRO-LOK 850, CERTIANTEED, KNAUF, OWENS CORNING. JACKET: ASJ KRAFT PAPER WITH ALUMINUM FOIL.
- C. 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
- 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 BUTBOOR EXPOSED BIBING RIGHLAHONESTHELE BEAMS AND FED FOR DEPARTMENT OF LOWER DEALER METERS THE PIPE.
- 6. CONTACT MANUFACTURER FOR ALTERNATIVE PRODUCTS.
- 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.
- E. SEMI RIGID BOARD TYPE DUCT INSULATION 1.51b DENSITY, CERTAINTEED 1B-300, JOHNS MANVILLE, KNAUF, OWENS CORNING:
- F. 1. ALL SUPPLY, RETURN AND OUTSIDE AIR WHERE EXPOSED.
- 2. MINIMUM DUCT INSULATION THICKNESS AND R VALUES ARE AS FOLLOWS:
- SUPPLY AND RETURN AIR IN UNCONDITIONED SPACE: 2" (R-6 MIN.) SUPPLY AND RETURN AIR IN CONDITIONED INTERIOR SPACE: 1.5" (R-4.2 MIN.) OUTSIDE AIR: 2" (R-6 MIN.)
- SUPPLY AIR IN CEILING RETURN AIR PLENUM: 1.5" (R-4.2 MIN.) RETURN AIR IN CEILING RETURN AIR PLENUM: NOT REQUIRED.
- DUCTWORK OUTSIDE OF BUILDING: 3" (R-8 MIN.)

# 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. PRESSURE RATING: 10-INCH WG POSITIVE AND 1.0-INCH WG NEGATIVE.
- . MAXIMUM AIR VELOCITY: 4000 FPM. TEMPERATURE RANGE: MINUS 20 TO PLUS 210 DEG F.
- 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.

#### 15890 - SHEETMETAL DUCTWORK

- A. ALL DUCT TO BE INSTALLED ACCORDING TO LATEST SMACNA STANDARDS
- ALL EXPOSED DUCT WORK SHALL BE DOUBLE WALL INTERNALLY INSULATED
- ALL SYSTEMS TO BE LEAKAGE TESTED.

# 15910 - SHEETMETAL ACCESSORIES

- A. AIR INLETS AND OUTLET REFER TO SCHEDULE.
- 2. ALL ALUMINUM CONSTRUCTION.
- ACCEPTABLE MANUFACTURERS: TITUS, PRICE, METAL-AIRE, CARNES, ANEMOSTAT,

## B. FLEXIBLE DUCTWORK

- TO BE FLEXMASTER TYPE 3, WIREMOLD TYPE WCK OMNIAIR 1200, OR THERMAFLEX. 2. FLEXIBLE DUCTWORK SHALL BE ACOUSTICAL LOW PRESSURE TYPE WITH INTERIOR LINER, METAL HELIX, FIBERGLASS INSULATION WITH AN R VALUE OF 6.0 OR GREATER AND COPOLYMER SEAMLESS OUTSIDE SLEEVE. THE ENTIRE FLEXIBLE DUCT ASSEMBLY SHALL BE LISTED IN ACCORDANCE WITH UL-181 CLASS 1 AIR DUCT MATERIAL. THE MAXIMUM LENGTH OF ANY FLEX DUCT SHALL BE 6'-0". FLEXIBLE DUCTWORK SHALL MEET THE FLORIDA MODEL ENERGY EFFICIENCY CODE. ALL JOINTS AT CONNECTIONS
- TO DIFFUSERS AND DUCTWORK SHALL BE SEALED WITH GLASS, FABRIC AND MASTIC. 3. FLEXIBLE NON-INSULATED DUCT SHALL BE FLEXMASTER ALUMINUM TRIPLE-LOCK METAL DUCT, MODEL NI-TL OR APPROVED EQUAL, ETL CLASS 0, MAXIMUM LENGTH USED SHALL BE 6 FT.

# C. TERMINAL CONNECTORS

- 1. GENERAL CONNECTORS SHALL BE RATED FOR 12" W.G., AND MEET NFPA 90A REQUIREMENTS. DUCT SHALL BE FABRICATED OR ALUMINUM SPIRAL HELIX AND REINFORCED RIP STOP ALUMINUM POLYESTER. PRESSURE DROP SHALL NOT EXCEED 0.6"/100'-0" AT 1000 FPM. WHERE INSULATION IS REQUIRED, FURNISH FACTORY APPLIED FIBERGLASS WITH REINFORCED VAPOR-BARRIER JACKET. INSULATION CONDUCTANCE VALUE SHALL NOT EXCEED 0.23. NON-INSULATED DUCT SHALL BE EQUAL TO FLEXMASTER TYPE 3. INSULATED DUCT SHALL BE EQUAL TO FLEXMASTER 3M. 2. HIGH VELOCITY - MAXIMUM DEVELOPED LENGTH OF CONNECTOR SHALL BE 6'-0". USE
- ATTACHED TO INSULATED DUCT, FURNISH INSULATED FLEXIBLE DUCT.
- 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,

METAL DUCTS AND FITTINGS TO REACH WITHIN 6'-0" WHERE CONNECTORS ARE

- 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.

# ACCESS DOORS

- 1. ACCEPTABLE MANUFACTURERS: RUSKIN, VENCO, NAILOR.
- 2. SIZE ACCESS DOOR AS FOLLOWS:

# 15970 - TEMPERATURE CONTROLS

- EXTEND EXISTING CONTROL SYSTEM TO NEW EQUIPMENT AND PROVIDE ALL MODIFICATIONS NECESSARY FOR A FULLY FUNCTIONING SYSTEM.
- B. AIR HANDLING UNIT AND CONSTANT VOLUME REHEAT BOXES
- 1. THE EXISTING CONTROL SYSTEM IS TO BE MODIFIED BY THE OWNERS EXISTING CONTROL VENDOR.
- 2. AUTOMATIC CONTROL VALVES SHALL BE FULLY PROPORTIONING WITH MODULATING PLUG OR V-PORT INNER GUIDES OR BALL TYPE. THE VALVE SHALL BE QUIET IN OPERATION AND FAIL-SAFE IN THE NORMALLY OPEN POSITION IN THE CONTROL EVENT OF CONTROL FAILURE. CONTROL VALVES SHALL BE SIZED BY THE CONTROL MANUFACTURER AND SHALL BE WARRANTED TO MEET THE HEATING AND COOLING LOADS AS SPECIFIED. CONTROL VALVES SHALL BE SUITABLE FOR THE PRESSURE CONDITIONS AND SHALL CLOSE AGAINST THE DIFFERENTIAL PRESSURE INVOLVED. VALVE OPERATORS SHALL BE OF THE PNEUMATIC OR ELECTRIC 24 VOLT TYPE. BODY PRESSURE RATING AND CONNECTION TYPE (SCREWED FLANGED OR FLANGED)
- 3. CONTROL CONTRACTOR SHALL PROVIDE ALL WIRING REQUIRED FOR THE CONTROL SYSTEM TO OPERATE. IF THE JOB CONTAINS SMOKE DAMPERS OR CAV/VAV BOXES THEY SHALL ALSO BE WIRED BY T.C.C.

SHALL CONFORM TO PIPE SCHEDULE ELSEWHERE IN THIS SPECIFICATION.

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

# 15990 - TEST AND BALANCE

PROVIDE COMPLETE TEST AND BALANCE OF ALL 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.
- 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.

## AIR SYSTEMS:

- MAKE CHANGES TO BELTS, PULLEYS, DAMPERS, VOLUME BOXES, ETC. TO OBTAIN DESIGN CONDITIONS AS REQUIRED BY TAB PROCEDURES.
- BALANCE SUPPLY, RETURN AND EXHAUST AIR OUTLETS WITHIN 10% OF DESIGN WHILE MAINTAINING REQUIRED PRESSURE RELATIONSHIPS. RECORD DESIGN AND ACTUAL TOTALS.
- MEASURE AND REPORT FAN RPM, FAN SUCTION PRESSURE, FAN DISCHARGE PRESSURE,
  - PRESSURE, FAN TOTAL PRESSURE AND PRESSURE DROP ACROSS COMPONENTS. DESIGN AND ACTUAL SUPPLY, RETURN, OUTSIDE AND EXHAUST AIR.

ACROSS EACH COIL AND AT EACH SUPPLY DISCHARGE AND RETURN INLET AT UNIT.

- PRESSURE DIFFERENTIAL ACROSS DUCT SMOKE DETECTORS. ADJUST FANS FOR LOWEST STATIC PRESSURE REQUIRED TO DELIVER TO OUTLETS

ACTUAL AND DESIGN NAMEPLATE AMPERAGE ON FAN MOTORS.

- AS NOTED IN NEBB OR AABC PROCEDURES. MEASURE SUPPLY AND RETURN ENTERING AND LEAVING TEMPERATURES (DB/WB)
- 4. CONFIRM OPERATION AND PROPER CALIBRATION OF ALL CONTROLS, THERMOMETERS AND
- 5. PROVIDE WRITTEN REPORT AT LEAST ONE WEEK BEFORE FINAL INSPECTION AND A

## TECHNICIAN DURING FINAL INSPECTION OF PROJECT PART 2 - PRODUCTS

# ROOFTOP EQUIPMENT

- ACCEPTABLE MANUFACTURERS
- TRANE CARRIFR JOHNSON CONTROL

## AIR CONDITIONING UNIT

- SELF-CONTAINED, PACKAGED ROOF MOUNTED, AIR-TO-AIR DX AIR CONDITIONING UNIT HAVING THE CAPABILITY OF COOLING THE REQUIRED CAPACITY OF OUTSIDE AIR FROM 91 DEGREE FDB/78 DEGREE FWB SO AS TO SUPPLY ROOM AIR AT 75 DEGREE FDB/50 PERCENT RH.
- HEATING IS NOT REQUIRED. UNIT TO BE FACTORY ASSEMBLED PRE-WIRED, DRAW-THRU UNIT WITH A MINIMUM OF 13 SEER SUITABLE FOR LOW PRESSURE OPERATION AND CONSIST OF A CABINET AND FRAME, SUPPLY FAN, CONTROLS, AIR FILTERS, VERTICAL DISCHARGE DUCTING, ROOF CURB, SERVICEABLE ACCESS PANELS WITH SCREWDRIVER OPERATED FLUSH CAM TYPE FASTENERS, REFRIGERANT COOLING COIL AND COMPRESSOR,
- CONDENSER COIL AND FAN AND COMPRESSOR REHEAT RECOVERY CONTROLLED BY A DUCT MOUNTED HUMIDISTAT. PROVIDE UNIT WITH A MOTORIZED OUTSIDE AIR DAMPER AND A MANUAL VOLUME DAMPER FOR FIXED OUTSIDE AIR MAKEUP QUANTITY.

- GALVANIZED STEEL BONDERIZED AND COATED WITH BAKED ENAMEL FINISH, ACCESS DOORS OR REMOVABLE ACCESS PANELS WITH QUICK SCREWDRIVER OPERATED FLUSH CAM TYPE FASTENERS. STRUCTURAL MEMBERS TO BE MINIMUM 18 GAUGE. REMOVABLE PANELS TO BE MINIMUM 20 GAUGE. INSULATE UNIT WITH 1/2 INCH THICK, 3 PCF DENSITY, NEOPRENE COATED GLASS FIBER INSULATION, "K" VALUE OF 0.26 AT 75 DEGREE F. INSULATION TO BE ADHERED AND PINNED TO THE CASING.
- CONSTRUCT DRAIN PAN FROM GALVANIZED STEEL WITH WELDED CORNERS AND A BOTTOM DRAIN. PITCH ENTIRE PAN TO DRAIN
- THE MANUFACTURER WILL BE RESPONSIBLE FOR PROVIDING ADDITIONAL RIGID BOARD TYPE INSULATION TO PREVENT THE UNIT FROM SWEATING UNDER THE ENCOUNTERED OPERATING CONDITIONS.
- SUPPLY FAN FORWARD CURVED, DOUBLE WIDTH, DOUBLE INLET CENTRIFUGAL TYPE FAN RESILIENTLY MOUNTED WITH V-BELT DRIVE AND RUBBER
- ISOLATED HINGE MOUNTED MOTOR.
- CONDENSER FAN DIRECT DRIVE, STATICALLY AND DYNAMICALLY BALANCED PROPELLER FAN, PERMANENTLY LUBRICATED AND WEATHERPROOF MOTOR UL LISTED FOR OUTDOOR USE, RESILIENTLY MOUNTED WITH FAN GUARD, MOTOR OVERLOAD PROTECTION, WIRED TO OPERATE WITH

COMPRESSOR.

- MOTORS AND DRIVES MOTORS: MAXIMUM HORSEPOWER AS INDICATED AND SPECIFIED. PROTECT MOTOR AGAINST CONTACT FAILURE, LOSS OF ANY PHASE (SINGLE PHASING), LOW VOLTAGE, HIGH VOLTAGE, VOLTAGE UNBALANCE, PHASE REVERSAL AND WIND FOR SPECIFIED VOLTAGE HAVING A MINIMUM POWER FACTOR OF 85 TO 100 PERCENT AND A MINIMUM EFFICIENCY OF 91.7 PERCENT AT 100 PERCENT LOAD AS PER IEEE TEST
- DESIGN FOR CONTINUOUS OPERATION IN 40 DEGREE C ENVIRONMENT AND FOR TEMPERATURE RISE UNDER PROVISIONS OF ANSI/NEMA MG 1 LIMITS FOR INSULATION CLASS, SERVICE FACTOR AND MOTOR ENCLOSURE.

PROCEDURE 112, METHOD B. REFER TO SECTION 15052 - VARIABLE FREQUENCY DRIVE OR SECTION 15055 - MOTORS.

- EVAPORATOR COIL WITH MINIMUM 3/8 INCH COPPER TUBES MECHANICALLY EXPANDED ONTO ALUMINUM PLATE FINS.
- - PROVIDE FLAT TYPE FILTER SECTION CONSTRUCTED OF GALVANIZED STEEL AND CONTAINING FILTER GUIDES AND HINGED ACCESS DOORS ON BOTH SIDES FOR SIDE LOADING OF FILTERS. PROVIDE 2 INCH DEPTH FILTER SECTION, UL CLASS 2, MEDIUM EFFICIENCY, GLASS FIBER, DISPOSABLE PLEATED TYPE AIR FILTERS WITH AN
- ATMOSPHERIC DUST SPOT (ADS) EFFICIENCY OF 40-45 PERCENT AND AN AVERAGE ARRESTANCE OF NOT LESS THAN 96 PERCENT.
- REFRIGERANT CIRCUIT
- UNIT TO CONTAIN ONE (1) SEALED REFRIGERANT CIRCUIT INCLUDING ONE HERMETIC COMPRESSOR, THERMAL EXPANSION VALVE METERING DEVICE, FINNED TUBE AIR-TO-REFRIGERANT HEAT EXCHANGER, REFRIGERANT EXPANSION VALVE AND SERVICE PORTS. COMPRESSOR TO BE A HIGH EFFICIENCY TYPE DESIGNED FOR COOLING ONLY AND MOUNTED ON VIBRATION ISOLATORS. PROVIDE
- COMPRESSOR MOTOR WITH INTERNAL OVERLOAD PROTECTION. FINNED TUBE COIL TO BE CONSTRUCTED OF LANCED ALUMINUM FINS NOT EXCEEDING ELEVEN PER INCH BONDED TO RIFLED COPPER TUBES

IN A STAGGERED PATTERN NOT LESS THAN ROWS DEEP AND HAVE A 450 PSIG WORKING PRESSURE

- REFRIGERANT CIRCUIT TO BE EQUIPPED WITH HOT-GAS REHEAT FOR CONTROL OF THE RELATIVE HUMIDITY OF THE SUPPLY AIR.
- MINIMUM 18 INCH HIGH GALVANIZED STEEL CHANNEL FRAME WITH GASKETS AND NAILER STRIPS.
- CONDENSER AND CONDENSATE DRAIN CONNECTIONS TO BE CONSTRUCTED OF BRASS FEMALE PIPE THREAD FITTINGS MOUNTED FLUSH TO SIDE OF CABINET EXTERIOR WITH OPTIONAL STAINLESS STEEL, BRAIDED HOSE KIT WITH SWIVEL CONNECTORS. CONDENSATE PIPING TO BE
- ELECTRICAL

SCHEDULE 40 PVC.

THERMOSTAT OR MAIN CIRCUIT BREAKER.

- FACTORY OR FIELD INSTALLED ENERGY MANAGEMENT RELAY TO ALLOW UNIT CONTROL BY AN EXTERNAL SOURCE. PROVIDE A LOCKOUT INDICATING TERMINAL IN THE LOW VOLTAGE CIRCUIT.
- DISCONNECT SWITCH: FACTORY MOUNT DISCONNECT SWITCH.

WHEN THE SAFETY CONTROLS ARE ACTIVATED TO PREVENT COMPRESSOR SHORT CYCLING, THE LOCKOUT CIRCUIT MUST BE RESET AT THE

TO THE BEST OF MY KNOWLEDGE THE PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE MINIMUM BUILDING CODES AS DETERMINED BY THE LOCAL AUTHORITY IN ACCORDANCE WITH THE 2014 FLORIDA BUILDING CODE, ALL AMENDMENTS AND SECTION 633 OF THE FLORIDA

AS NOTED

Richard Tavares P.E Florida Reg. No. 73704

Issued Date:

Level II Alteration

Green Owl

Restaurant

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Delray Beach

Florida

RCHITECTURE

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AAC002029

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Beacon Consulting Engineers

<u> Mechanical · Plumbing · Electrical · Fire Protecti</u>

RickBrautigan

PROGRESS SET/NFC 03/04/2016

MECHANICAL SPECS

3. NO MATERIALS OR SYSTEMS ARE TO BE FABRICATED UNTIL: A) ALL DIMENSIONS HAVE BEEN VERIFIED BY CONTRACTOR B) SHOP DRAWINGS HAVE BEEN REVIEWED AND ACCEPTED BY THE ARCHITECT

DRAWINGS ARE NOT TO BE SCALED. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER ALL SCALED DIMENSIONS. 2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND ADVISE ARCHITECT OF ANY DISCREPANCIES. CONSTRUCTION SHALL NOT PROCEED UNTIL SAID DISCREPANCIES HAVE BEEN RESOLVED.

ALL DESIGNS, CONCEPTS, AND IDEAS CONTAINED AND REPRESENTED HEREIN ARE THE PROPERTY OF RICK BRAUTIGAN ARCHITECTURE, INC. EXPRESSED IN WRITING

INSULATION R-VALUE: COMPLY WITH ASHRAE/IESNA 90.1, R-6 MINIMUM.

STATUES.