SECTION 1500
AIR CONDITIONING, HEATING, AND VENTILATION

PART1. WORK INCLUDED:

- A. This section cover oil labor, equipment and material and operations to complete the installation of air conditioning, heating and ventilating systems and their controls as shown on the drawing and hereinafter specified and/or required.
- B. For work in connection with kitchen hoods, see paragraph 1.06.
- C. Refer to Section 01010 concerning cutting of holes by other trades.
- D. Requirements of General Conditions apply to work of this section.

PART2. GENERAL:

- A. All work shall be done in conformity with local building codes, and all legally constituted public authorities having jurisdiction.
- B. Materials; New and in perfect condition; materials for similar uses to be of type and manufacture unless otherwise authorized.
- C. Workmanship: Best standard practice of the trade.
- D. Applicable Specifications: Materials and workmanship not otherwise specified to be in accordance with the latest applicable Federal, NFPA, ASA, ASME, SMACNA, ASTM, or 111A Specification.
- E. Permits, Licenses, Fees, and Inspections shall be obtained and paid for as required.
- F. Cover to protect, and otherwise provide for safety and good condition of all materials and equipment. Store small accessory items in truck or shop until permanently installed or replace missing items at own expense.
- G. Replace all damaged and effective material or work prior to filling application for final inspection.
- H. Diagrammatic indications on drawings are approximate only, and are subject to re-arrangement for proper installation only after written approval by Krystal Construction Department Representative. Certain runs of ductwork and piping shown disturbed to avoid confusion.
- I. Perform all work with the purpose of having construction progress to meet schedule with a minimum of interference between trades.

PART3. DUCTWORK:

- A. Install ductwork and equipment as required in available space, avoiding interference with Architectural and Structural members and work of other trades. Krystal Construction Department Representative to be notified of any required relocations. Preserve headroom and keep openings and passageways clear. Neatly arrange symmetrical with building lines, lights acoustical tile pattern, etc., and occupy minimum space.
- B. Sheet Metal Gauge and Construction: Galvanized sheet metal in accordance with recommendation of ASHRAE Guide, SMACNA and to comply with all National and Local Code requirement.
  - A. Duct construction per ASHRAE and SMACNA: Rectangular Duct: Up thru 22" 26 ga., 23" thru 30" 24 ga., 31" thru 54" 22 ga., 55" thru 84" 20 ga. Round Duct: Up thru 12" 26 ga., 13" thru 24" 24 ga.
  - • Longitudinal Seams: Grooved or Pittsburgh or button punch.
  - • Transverse Joint Connections: For rectangular ducts sized as follow:
    - A. Up thru 18": Drive slip "S" slip or 1" packet lock.
    - B. 19" thru 30": Hemmed "S" slip. 1" bar slip, or 1" pocket lock. 5' centers (max).
    - C. 31" thru 42": 1" bar slop, 1" reinforced bar slip. Or 1" pocket lock, 5' centers (max).
    - D. 43" thru 60": 1 ½" reinforced bar slip, or 1 ½" angle reinforced slip, or 1 ½" angle reinforced pocket lock. 5' centers.
    - E. 61" thru 84": 1 ½" reinforced bar slip, or 1 ½" angle reinforced slip, or 1 ½" angle reinforced pocket lock. 2'6" centers.
  - • Exhaust ducts from hoods shall be grease rated.
- C. Supports: Galvanized strap or angle iron of required gauge and width in a manner that will prevent bulging, bending, sagging, or swaying or ductwork.
- D. Elbows: To be mode for an easy flow of air for minimum friction, inside radius equal to width of duct. Where space does not permit required radius, and where indicated on the drawings, square elbows with approved duct turns must be used.
- E. Access Doors or Panels in insulated ducts or plenums to be sleeved for insulation thickness and filled with equivalent insulation.
- F. Painting: All ductwork visible through grilles shall be painted flat black.
- G. Duct Sealing: Seal all duct joints and seams exposed on roof to ensure water-tightness with Hardcost tape Type AFT701, applied in accordance with manufacturer's recommendations. No substitutions.
- H. Sealing at Equipment on Roof: All fields connections at furnace section, filter section, etc., shall be thoroughly sealed with hardcost tape as noted for duct sealing in item G above.
- I. Lateral takeoffs and spin-in connectors shall be sealed, using Hardcost Company Type 301 tape, with polyethylene backing.
- J. Seal all seams with flexible seam filler (2-coats) and fiberglass reinforced mesh (Mastik or equal).
- K. Flexible Ducts: Pre-insulated flexible fiberglass air duct, encased in a vapor barrier jacket, with aluminum foil liner, K factor, of 0.24 at 75", meet requirements of NFPA 90A for air ducks, Genflex Company type SM2DEL spin-in type connection with manual volume damper, 45" extractor, and insulation collar. Manufacturer: Gloss Flex SL-181 MCE or approved equal. Install in fully extended position using only minimum length required to make the connections with ½" wide positive locking steel straps. Support duct at maximum 3' spacing using 2" wide flat binding material.
- L. Access to Duct & Concealed Equipment: It shall be the responsibility of the installing contractor to provide the general Contractor with the desired location of each access door panel required in ceiling or walls for access to all concealed dampers, controllers, etc.
- M. Counter-flash all vents, ducts and pipes passing through roof, with locked and solered #24-gauge galvanized sheet metal flashing. All counter flashing to be sealed a specified. See duct flashing detail on drawing.

PART4. EQUIPMENT TO BE FURNISHED UNDER THE CONTRACT:

- A. Air conditioning units shall be of the direct expansion, self-contained type, combination air-to-air cooling and gas fired heating and shall be mounted on a full perimeter roof curb. Unit shall be a A.G.A. certified. Units shall have total net cooling capacity as shown on the drawings. Units shall have an EER of 12.0 or greater rated in accordance with Ari Standard 210.
  1. Unit cabinet shall be constructed of galvanized steel, banderized and coated with baked enamel.
  2. The unit shall contain welded, fully hematic compressors, 2 on each unit with suitable vibration isolators and crankcase heater and have a 5-year warrant.
  3. Coils shall be constructed of aluminum plate fins or copper fins for coastal areas mechanically bonded to copper tubes.
  4. The indoor air fan shall be of the forward-curved centrifugal type, belt driven by a motor, with adjustable speed pulley. The outdoor air fan shall be of the propeller type discharging upward.
  5. Safety Controls: Protect cooling section by low pressure tat, compressor motor over loads, crankcase heaters and lockout circuit that prevents compressor restart until reset at the thermostat.
  6. GAS HEATING: Heating controls shall consist of a redundant gas valve intermittent pilot ignition system, limit switches, centrifugal switch, and roll-out switch.
  7. Provide all units with an automatic shutdown smoke detection system. Locate smoke detector downstream of the coils. Upon detection of smoke in the system, the fan stop. The system shall comply with the requirements of NFPA 90A. Chapter 4 (1987 edition). Smoke detectors shall be installed by mechanical contractor, provided and connected by electrical contractor.
- B. Filter Media: 2" thick of glass fibers formed with thermosetting resin into a pattern that gives each fiber a large amount of curvature in both horizontal and vertical planes. Farr or equal. Furnish number and size as indicated on the drawings and/or supplied with the air conditioning unit.
- C. Toilet Exhaust Fans: Roof mounted belt driven, as listed in fan schedule.
- D. Extractors: As shown and specified on drawing, by Carnes.
- E. Manual Volume Dampers: Provide dampers with locking and indicating quadrants in each branch of all ducts as indicated on the drawings, in addition to any volume control at outlets. After final adjustment of system, lock quadrants and mark clearly showing damper position, open and shut positions where required by local code, the handles shall be removable after balancing.
- F. Duct Insulation: Duct wrap shall be 2-inch-thick 1 pound per cubic foot density gloss fiber wrap having a foil-skim-Kraft (FSK) vapor barrier. The FSK vapor barrier shall have a maximum vapor permeability of 0.02 perms, and shall have a 2-inch overlapping facing tabs on one edge to provide for a continuous vapor seal. Insulation shall be secured to ductwork with ½" O.C. staples on 2" centers to secure 2" facing tab in longitudinal joints and 4" side sealing strip and butt joints no insulation shall be cut where a hanger is located. Cover all staples with 3" wide vapor barrier tape or white vapor barrier coating Foster 30-36. Insulation shall have a minimum installed R value of 5.0.
- G. Automatic Temperature Controls:
  1. Temperature control system to be complete in every detail including all instruments, controls, thermometers, transformer and all necessary appurtenances.
  2. RTU-1, and RTU-2 room thermostats shall be Carrier Model No. 33 CS2PP2S-02 with 2-stage cooling and 2-stage heating with CARRIER 33ZCT55SPT remote sensor and CARRIER HL38MG029 Dehumidistat. Provide 24 Volt power. Use 74" and 76" sensors for cooling and 70" and 69" sensors for heating cycles.
- H. Control Sequence of Operations:
  1. Cooling: With the thermostat selector switch set at "cool" or "auto" and the fan switch set at "on", upon a rise in room temperature the first stage cooling sensor (74") energizes the first stage cooling contractor and the indoor fan contractor. The first stage compressor and the indoor and outdoor fan motor start and run. Upon a rise in room temperature, the second stage cooling sensor (75") energizes the second stage cooling contractor. The second stage compressor starts and runs. If unit operation interrupted by the low-pressure switch, the affected refrigeration cycle shuts down until the low-pressure switch closes. If the compressor restart until manual reset is accomplished at the thermostat by turning unit "off" & "on".
  2. Gas heating: With the thermostat selector switch set at "heat" or "auto" and the fan switch set at "on", upon a decrease in room temperature the first stage heating sensor (70") energizes the combustion air fan, the pilot gas valve opens, and pilot is lit. When pilot is "proven" (approximately 30 seconds), the first stage gas valve opens. The indoor fan is energized after 35-45 seconds. Unit then operates on first stage of heating. Upon a further decrease in room temperature, the second stage heating sensor (67") energizes the second stage gas valve and the unit operates at full capacity. When all heating needs have been satisfied, sensors de-energize and gas valves close.
  3. Automatic Changeover: With the thermostat selector switch in the "auto" position, unit automatically changes from heating to cooling based on the temperature sensors demand for one or the other. Thermostat is interlocked so that cooling and heating systems cannot operate at the same time.
  4. Air Circulation only: With the thermostat set at "SYSTEM OFF" and "FAN ON", indoor air fan operates continuously for air circulation. When controls are set at "SYSTEM HEAT" of "SYSTEM COOL" and "FAN ON", heating and cooling operation is provided as required, while the indoor fan operates continuously.

Part 5. BALANCING:

- A. Adjust and test all air moving equipment, air distribution, heating systems, exhaust, and make-up air systems as specified, including kitchen hoods exhaust and makeup air system, and as indicated on the drawings. The hood system will be balanced by the HVAC contractor.
- B. Balancing and testing shall not begin until all systems are completed and in full working order, but before restaurant is open for business.
- C. Changes in drives, dampers of the addition of dampers, control devices or gauges required for correct balance as required, shall be made at no additional cost to owner.
- D. All Instruments, forms and procedures shall meet the requirements set forth by the National Environmental Balancing Bureau NEBB).
- E. Cycle all equipment and systems to check for correct wiring and sequencing.
- F. The HVAC subcontractor shall balance the building systems to the quantities shown on the drawings, adhering to the air balance schedules (M1.3). The building shall Maintain a positive pressure.

Part 6. KITCHEN HOOD, EXHAUST & MAKEUP AIR:

- A. The kitchen exhaust hoods and exhaust and makeup air system, as shown on drawing produced by manufacturer, will be furnished by owner. This Contractor shall receive and install the equipment, and provide additional ductwork as indicated.
- B. At the time of delivery of this equipment to the job, the HVAC subcontractor shall open all crates and cartons and check items against the shipping list enclosed. Then, before accepting the shipment from freight carrier, the HAVC Subcontractor shall verbally (phone) contact the home office of the General Contractor and report all items either there or missing. Confirm this verbal notification by letter the same day to General Contractor's Home Office.

Part 7. GUARANTEE:

- A. Contractor shall replace or make good any defect due to faulty workmanship or material which shall develop within one (1) year from date of acceptance of the job. This shall include at no cost to Owner, any required maintenance and service, including refrigerant and oil replacement when required, but excluded filter maintenance.
- B. Povide all items and services necessary to assure to proper operation of the system for the year. At the change of seasons, make any necessary adjustments in systems including control set points. The requirement for inspections is not intended to, and shall not obligate the contractor to perform any work during this year which is normal maintenance. However, if faulty or defective parts are found during the inspections, repair or replace then in accordance with the guarantee provisions of this specifications.

Part 8. FINAL CLEANUP:

- A. Thoroughly clean equipment; remove grease and oil spots with cleaning solvent and carefully wipe surface. Carefully clean and steel brush exposed ductwork, removing all rust and other spots.
- B. Remove all scraps and installation related debris from area. Leave entire installation in a neat, clan and usable condition.

END OF SECTION

HVAC GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT IN STRICT ACCORDANCE WITH APPLICABLE CODES AND STANDARDS, AND PER MANUFACTURER'S DIRECTIONS.
2. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL NECESSARY PERMITS, LICENSE, INSPECTIONS, APPROVALS, AND FEES.
3. THE CONTRACTOR SHALL PROVIDE A WRITTEN GUARANTEE THAT SHALL WARRANT ALL WORKMANSHIP AND MATERIALS FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE BY THE OWNER. ANY BREAKDOWN OCCURRING IN THE FIRST YEAR SHALL BE AT NO EXPENSE TO THE OWNER. ALL REFRIGERATION COMPRESSORS SHALL HAVE A FIVE YEAR (PARTS ONLY) WARRANTY, AND ALL NATURAL GAS HEAT EXCHANGERS SHALL HAVE A TEN YEAR (PARTS ONLY) WARRANTY.
4. DRAWINGS ARE SCHEMATIC, NOT ALL RISES AND DROPS ARE SHOWN. DO NOT SCALE DRAWINGS FOR MEASUREMENTS.
5. TRADES ARE TO COORDINATE THEIR WORK WITH ALL OTHER TRADES TO AVOID CONFLICTS. GENERALLY, DUCTWORK SHALL BE KEPT AS HIGH AS POSSIBLE.
6. CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS PRIOR TO ORDERING EQUIPMENT OR SUBMITTING SHOP DRAWINGS AND SHALL FURNISH EQUIPMENT WIRED FOR VOLTAGES SHOWN THEREIN.
7. CONTRACTOR SHALL COORDINATE THE INSTALLATION OF MECHANICAL EQUIPMENT, DUCTWORK, ETC. TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL AND STRUCTURAL CONDITIONS. ALL SUSPENDED MATERIALS AND EQUIPMENT SHALL BE INDIVIDUALLY SUPPORTED FROM THE BUILDING STRUCTURE. DO NOT SUSPEND ITEMS FROM THE CEILING OR ITS SUPPORT SYSTEM.
8. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE STRUCTURAL ENGINEER OF RECORD.
9. CONTRACTOR SHALL KEEP A SET OF MARKED UP PRINTS WITH ANY FIELD CHANGES MADE DURING CONSTRUCTION TO CREATE AN "AS-BUILT" SET OF PRINTS TO BE TURNED OVER TO THE OWNER AT THE COMPLETION OF THE PROJECT.
10. PROVIDE ACCESS PANELS IN CEILINGS AND WALLS TO ALLOW ACCESS TO VALVES, TRAPS, DAMPERS, CLEANOUTS, CONTROLS, ETC. MINIMUM ACCESS SIZE - 12"x12" UNLESS LIMITED BY PHYSICAL CONSTRAINTS.
11. ALL CONDENSATE DRAIN PIPING SHALL BE TYPE L HARD DRAWN COPPER, ASTM B-88, WITH TYPE DWV FITTINGS, ASME B16.23, OR SCHEDULE 40 PVC, ASTM D1785, WITH TYPE DWV FITTINGS, ASTM D2672. COPPER DRAIN PIPE AND FITTINGS SHALL BE JOINED USING 95-5 SILVER SOLDER, AND PVC PIPE AND FITTINGS SHALL BE JOINED USING SOLVENT CEMENT. PROVIDE TRAP WITH CLEANOUT AND UNIONS. SLOPE CONDENSATE DRAIN LINES A MINIMUM OF 1/8" PER FOOT AWAY FROM THE MECHANICAL EQUIPMENT.
12. MECHANICAL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
13. OUTSIDE AIR FOR AIR CONDITIONING UNITS SHALL BE A MINIMUM OF 10 FEET FROM EXHAUST FANS, EXHAUST OPENINGS AND PLUMBING VENTS.
14. ALL DUCT DIMENSIONS SHOWN ARE INSIDE CLEAR DIMENSIONS.
15. ALL SUPPLY AND RETURN DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE LATEST SMACNA AND ASHRAE STANDARDS. DUCTWORK SHALL BE FABRICATED OF GALVANIZED STEEL FOR A PRESSURE RATING OF (-) 2" WG FOR RETURN AND (+) 2" WG FOR SUPPLY DUCTWORK. ALL EXHAUST DUCTWORK SHALL CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH THE LATEST SMACNA AND ASHRAE STANDARDS. EXHAUST DUCTWORK SHALL BE FABRICATED OF GALVANIZED STEEL FOR A PRESSURE RATING OF 1" WG IN EXCESS OF THE SYSTEM FAN TOTAL STATIC PRESSURE RATING AT DESIGN FLOW RATE, UNLESS NOTED OTHERWISE.
16. SUPPORT DUCTWORK FROM BUILDING STRUCTURE IN ACCORDANCE WITH SMACNA STANDARDS.
17. RADIUSED DUCTWORK ELBOWS SHALL HAVE A CENTERLINE RADIUS OF 1.5 TIMES THE DUCT WIDTH (OR DIAMETER) UNLESS NOTED OTHERWISE.
18. ALL MITERED ELBOWS (RECTANGULAR AND ROUND) SHALL HAVE DOUBLE THICKNESS TURNING VANES INSTALLED UNLESS NOTED OTHERWISE ON DRAWINGS.
19. SECURELY SEAL ALL JOINTS LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK USING WELDMENTS, MECHANICAL FASTENERS WITH SEALS OR GASKETS OR MASTICS, MESH AND MASTIC SEALING SYSTEMS OR TAPES. TAPES AND MASTICS MUST BE LISTED AND LABELED IN ACCORDANCE WITH UL181A OR UL181B.
20. DUCT CONNECTIONS TO FANS AND OTHER AIR DISTRIBUTION EQUIPMENT SHALL BE MADE USING MECHANICAL FASTENERS WITH SEALS, MASTICS OR GASKETS.
21. SUPPLY AIR AND RETURN AIR DUCTWORK SHALL BE INSULATED WITH A MINIMUM 2" THICK, 3/4 LB. PER CUBIC FOOT, FIBERGLASS DUCTWRAP, WITH FOIL FACED VAPOR BARRIER AND AN INSTALLED THERMAL RESISTANCE OF 6.0 (R VALUE). ALTERNATE INSULATION FOR RECTANGULAR SUPPLY AND RETURN DUCT SHALL BE AN INTERIOR DUCT LINING WITH A MINIMUM 1-1/2" THICK, 1.5 LB. PER CUBIC FOOT DUCT LINER. DUCT LINER SHALL CONTAIN AN ANTI-MICROBIAL AGENT WITHIN THE DUCT LINING ITSELF. MINIMUM "R" VALUE SHALL BE R-6.3. INCREASE DUCT SHEET METAL SIZE AS REQUIRED TO MEET INSIDE CLEAR DIMENSIONS GIVEN ON DRAWINGS.
22. ALL DUCT INSULATION SHALL MEET THE MINIMUM REQUIREMENTS OF U.L. 181 FOR FLAME SPREAD AND SMOKE DEVELOPMENT, AND SHALL BE U.L. LISTED.
23. TRANSFER DUCTS SHALL BE INTERNALLY LINED TO AID IN CANCELING NOISE TRANSFER.
24. EXHAUST DUCTWORK SHALL BE INSULATED UNLESS NOTED OTHERWISE.
25. COORDINATE LOCATIONS OF GRILLES, REGISTERS AND DIFFUSERS WITH ARCHITECTURAL REFLECTED CEILING PLAN. LOCATIONS SHOWN ARE APPROXIMATE, ADJUST LOCATIONS IN THE FIELD AS REQUIRED BY CONSTRUCTION CONSTRAINTS.
26. PROVIDE EACH SUPPLY AIR OUTLET OR DIFFUSER WITH ITS OWN BALANCING DEVICE. DEVICES CAN BE LOCATED IN DUCTWORK OR SUPPLY AIR DEVICE ITSELF.
27. ALL MANUAL BALANCING DAMPERS SHALL HAVE A LOCKING QUADRANT.
28. FLEXIBLE DUCTWORK SHALL BE CLASSIFIED UNDER UL 181. PROVIDE A MINIMUM OF 3 FEET IN LENGTH AND A MAXIMUM OF 8 FEET IN LENGTH, SUPPORTED WITH 3" GALVANIZED SHEET METAL STRAPS AT 4 FEET CENTERS (MAX). FLEXIBLE DUCT RUNOUTS SHALL BE ROUND DUCTWORK REINFORCED WITH A WIRE HELIX AND INSULATED WITH 1-1/2" THICK FIBERGLASS (WITH A 6.0 "R" VALUE MINIMUM) COVERED WITH FLAMEPROOF VAPOR BARRIER OF ALUMINUM METALIZED POLYESTER FILM LAMINATED TO GLASS MESH. DUCT SHALL BE ATCO'S UPC #036 VALUFLEX CLASS 1 AIR DUCT OR EQUAL. CONNECTIONS TO DUCT MAINS SHALL BE MADE WITH FITTINGS PROVIDED WITH TWIST RINGS, BUTTERFLY DAMPERS, LOCKING HAND QUADRANTS, AND INSULATION GUARDS.
29. CONTRACTOR SHALL FURNISH, ROUTE, AND INSTALL CONTROL WIRING FOR ALL MECHANICAL SYSTEMS. FOR SYSTEMS WITH MULTIPLE COMPONENTS CONTRACTOR IS RESPONSIBLE FOR ALL WIRING BETWEEN COMPONENTS.
30. INSTALL THERMOSTATS AT 4'-0" A.F.F. UNLESS NOTED OTHERWISE. THERMOSTAT LOCATIONS SHALL BE COORDINATED WITH FINAL LOCATIONS OF WALL-MOUNTED ARCHITECTURAL AND ELECTRICAL EQUIPMENT. FINAL LOCATIONS MUST BE APPROVED BY THE ARCHITECT AND OWNER. THERMOSTATS SHALL NOT BE INSTALLED ON EXTERIOR WALLS IF INTERIOR WALLS ARE AVAILABLE WITHIN SPACE SERVED BY THERMOSTAT. SHOULD THE THERMOSTAT REQUIRE INSTALLATION ON AN EXTERIOR WALL AN INSULATED BACKING PLATE MUST BE PROVIDED TO PREVENT FALSE READINGS BY THE THERMOSTAT.
31. MCHANICAL CONTRACTOR SHALL PROVIDE A COMPLETE TEST AND BALANCE REPORT OF THE HVAC SYSTEMS PREPARED BY AN INDEPENDENT TEST AND BALANCE CONTRACTOR. A COPY OF THE TEST AND BALANCE REPORT SHALL BE TRANSMITTED TO THE LOCAL CODE OFFICIALS AS REQUIRED.
32. ALL PENETRATIONS THROUGH EXTERIOR WALLS & ROOF SHALL BE FLASHED & COUNTERFLASHED IN A WATERPROOF MANNER. (COLOR TO MATCH EXTERIOR).
33. REFRIGERANT PIPING, NOT SHOWN ON PLANS, SHALL BE SIZED & INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INSTALLATION INSTRUCTIONS AND LOCAL CODES.
34. CONTRACTOR SHALL VERIFY LOCATION OF ALL PENETRATIONS FOR RELIEF HOODS, OUTSIDE AIR HOODS, LOUVERS, AND WALL CAPS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
35. PENETRATIONS OF RATED WALLS, PARTITIONS AND FLOORS OF NON- COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH NONCOMBUSTIBLE MATERIALS. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOOR OF COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH MATERIALS EQUIVALENT TO TWO INCHES OF WOOD. FIRESTOPPING SHALL COMPLY WITH ASTM E-814.
36. KITCHEN HOOD EXHAUST DUCT SHALL BE 16 GAUGE CARBON STEEL. ALL JOINTS AND SEAMS SHALL BE CONSTRUCTED WITH A CONTINUOUS LIQUID-TIGHT EXTERNAL WELD. ALL DUCTWORK SHALL SLOPE A MINIMUM OF 1/8" INCH PER FOOT TOWARD HOOD. PROVIDE CLEANOUTS AT EVERY CHANGE OF DIRECTION IN THE EXHAUST DUCT.
37. CONTRACTOR SHALL PREPARE ALL EXPOSED DUCT, GRILLES, PIPING, AND UNITS FOR PAINTING. GC WILL BE RESPONSIBLE FOR PAINTING.
38. AIR HANDLERS WITH AIRFLOWS GREATER THAN OR EQUAL TO 2000 CFM OR THAT SHARE A COMMON OUTSIDE AIR OR RETURN DUCT SHALL BE FACTORY FURNISHED WITH SMOKE DETECTORS LOCATED IN THE SUPPLY AND RETURN SECTIONS FOR ALL UNITS. SMOKE DETECTORS SHALL BE WIRED TO THE ALARM PANEL BY THE ELECTRICAL CONTRACTOR.

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WAVE PROJECT # 18072

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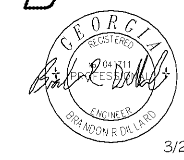

3/22/18

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1447 Highway 138
Conyers, Georgia 30012
Rockdale County, Georgia

Revisions		
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