

MECHANICAL SPECIFICATIONS

SCOPE

THE WORK REQUIRED FOR THIS SECTION INCLUDES LABOR, MATERIALS, EQUIPMENT, APPURTENANCES, SERVICE AND SUPERVISION REQUIRED TO PROVIDE COMPLETE WORKING MECHANICAL SYSTEMS, SPECIFICATIONS, CODES AND STANDARDS.

THE LATEST EFFECTIVE PUBLICATIONS OF THE FOLLOWING STANDARDS, CODES, ETC. AS APPLICABLE, FORM A PART OF THESE SPECIFICATIONS.

- APPLICABLE CODES OR ORDINANCES OF LOCAL GOVERNING AGENCIES.
 - NATIONAL FIRE PROTECTION ASSOCIATION (NFPA).
 - UNDERWRITERS' LABORATORIES, INC. (UL).
 - AIR MOVING AND CONTROL ASSOCIATION (AMCA) STANDARDS.
 - NATIONAL ELECTRICAL CODE (NEC).
 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
 - INTERNATIONAL RESIDENTIAL BUILDING CODE (IRBC).
 - INTERNATIONAL MECHANICAL CODE (IMC).
 - INTERNATIONAL FUEL GAS CODE (IFGC).
 - AMERICAN GAS ASSOCIATION (AGA).
 - SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SHACNA).
 - AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE).
- CONTRACTOR SHALL OBTAIN AND PAY FOR PERMITS AS REQUIRED.

DRAINAGES

THE DRAINAGES INDICATE DIAGRAMMATICALLY THE EXTENT OF THE WORK. MINOR VARIATIONS IN LOCATION OF EQUIPMENT SHALL BE MADE UPON WRITTEN APPROVAL OF THE ARCHITECT/ENGINEER AT NO ADDITIONAL CHARGE.

INSTALLATION OF EQUIPMENT

IF THE EQUIPMENT PROVIDED DIFFERS FROM THAT SHOWN ON THE DRAINAGES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR AND SHALL SUBMIT FOR APPROVAL ANY REDESIGN THAT IS NECESSARY AT NO ADDITIONAL COST TO THE OWNER.

UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAINAGES, EQUIPMENT INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED INSTALLATIONS.

COORDINATION

COOPERATE AND COORDINATE THE WORK OF THIS SECTION WITH OTHER TRADES.

MATERIALS AND EQUIPMENT

MATERIALS AND EQUIPMENT SHALL BE NEW AND FREE OF SCRATCHES AND/OR OTHER IMPERFECTIONS.

MATERIAL AND EQUIPMENT SHALL BE PROPERLY STORED AND PROTECTED AT THE PROJECT SITE.

WORKMANSHIP SHALL BE OF HIGHEST QUALITY AND SHALL CONFORM TO STANDARD PRACTICE FOR THE TRADE.

SHOP DRAINAGES

COMPLETE SCHEDULES OF MATERIAL AND EQUIPMENT PROPOSED FOR INSTALLATION SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER.

SUBSTITUTION OF MATERIAL AND EQUIPMENT

THE NAME OF A CERTAIN BRAND, MAKE, MANUFACTURER OR DEFINITE SPECIFICATION IS TO DENOTE THE QUALITY STANDARD OF ARTICLE DESIRED. SUBSTITUTION OF ANY OTHER BRAND, MAKE OR MANUFACTURER WHICH IN THE OPINION OF THE ENGINEER IS RECOGNIZED THE EQUAL OF THAT SPECIFIED, MAY BE ACCEPTED.

RECORD DRAINAGES

UPON COMPLETION OF THE WORK AND WITHIN THIRTY DAYS AFTER THE FINAL INSPECTION, THE CONTRACTOR SHALL SUBMIT TWO COPIES OF RECORD MECHANICAL DRAWINGS TO THE ARCHITECT/ENGINEER. THESE DRAWINGS MAY BE PRINTS OF THE ORIGINAL CONTRACT DRAWINGS WITH CHANGES MARKED IN RED. ADDENDUM SKETCHES AND CHANGE ORDER SKETCHES OR CORRECTED SETS AS AT THE OPTION OF THE CONTRACTOR. THE DRAWINGS SHALL INDICATE ANY DEVIATIONS MADE IN ACTUAL INSTALLATION TO THE CONTRACT PLANS.

ELECTRICAL WORK

STARTERS, CONTROLLERS, THERMOSTATS, FAN SWITCHES, INDICATING LIGHTS, ETC., CONTROL WIRING AND WIRING FOR REMOTE CONTROL STATIONS SHALL BE PROVIDED UNDER THE SECTION PROVIDING THE RESPECTIVE MOTOR AND/OR EQUIPMENT UNLESS OTHERWISE INDICATED.

POWER WIRING AND POWER CONNECTIONS TO ALL EQUIPMENT SHALL BE PROVIDED UNDER SECTION "ELECTRICAL," UNLESS OTHERWISE INDICATED ON THE ELECTRICAL DRAWINGS.

WHEN SUBSTITUTED MOTORS AND/OR EQUIPMENT REQUIRE ELECTRICAL MODIFICATIONS, THE CODE OF THE ELECTRICAL MODIFICATIONS AND COORDINATION SHALL BE INCLUDED UNDER THE SECTION PROVIDING THE MOTOR AND/OR EQUIPMENT.

CONTROL WIRING SHALL BE IN CONDUIT, EXCEPT LOW VOLTAGE WIRING IN CONCEALED, ACCESSIBLE NON-AIR PLenum CEILING SPACES MAY BE RUN WITHOUT CONDUIT IF ADEQUATELY SUPPORTED WITH CABLE TIES.

ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE ELECTRICAL SECTION OF THIS SPECIFICATION.

PROVIDE CONTROLLERS FOR EACH PIECE OF EQUIPMENT AS REQUIRED.

MOTORS, STARTERS AND CONTROLLERS SHALL CONFORM TO THE LATEST APPLICABLE NEMA STANDARDS AND SHALL BE SUITABLE FOR USE FOR THE SERVICE INTENDED AT THE LOCATIONS INDICATED. CONTROLLERS SHALL BE PROVIDED WITH THERMAL OVERLOAD PROTECTION IN EACH PHASE AND SHALL BE AN APPROVED MANUAL OR MAGNETIC TYPE. WHERE CONTROL VOLTAGES ARE DIFFERENT FROM MOTOR VOLTAGES, A CONTROL VOLTAGE TRANSFORMER SHALL BE PROVIDED AS PART OF THE START. CONTROL VOLTAGE SHALL NOT EXCEED 150 VOLTS TO GROUND.

CUTTING AND PATCHING

CUTTING, DRILLING AND CHANNELING REQUIRED FOR THIS WORK SHALL BE DONE UNDER THIS SECTION BY SKILLED MECHANICS OF TRADE INVOLVED.

MECHANICAL EQUIPMENT

HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT SHALL BE FURNISHED AND INSTALLED AS SCHEDULED ON THE DRAINAGES OR AS SPECIFIED WITHIN THIS SEARCH.

PACKAGED REFRIGERATION COMPRESSORS AND/OR CONDENSING UNITS SHALL BE FURNISHED WITH MANUFACTURER'S FIVE-YEAR TERM WARRANTY.

DUCTWORK

DUCTWORK SHALL BE GALVANIZED STEEL SHEETS CONSTRUCTED AND SUPPORTED AS INDICATED OR IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE ASHRAE GUIDE AND SHACNA LOW VELOCITY DUCT CONSTRUCTION STANDARDS.

EXHAUST DUCTWORK FROM SHOWER SHALL BE CONSTRUCTED OF ALUMINUM ALLOY DUCT SHEETS.

THE SIZE AND LOCATION OF THE DUCTWORK SHALL BE SUBJECT TO SUCH VARIATIONS AS MAY BE NECESSARY TO SUIT THE FIELD CONDITIONS. WHERE SIZES MUST BE VARIED FROM THOSE INDICATED ON THE DRAINAGES, THE FILL AREA OF THE DUCT SHALL BE MAINTAINED WITH NO INCREASE IN AIR PRESSURE DROP.

FLEXIBLE CONNECTIONS SHALL BE MADE OF NEOPRENE COVERED 20-OUNCE GLASS FABRIC

PROVIDE VOLUME DAMPERS TO BALANCE THE OUTSIDE AIR INTAKE SYSTEMS. DAMPERS SHALL BE SUITABLE FOR SHUT-OFF SERVICE AND SHALL BE CONSTRUCTED OF NOT LIGHTER THAN 20 GAUGE GALVANIZED SHEET METAL AND SHALL BE EQUIPPED WITH BLADE BEARINGS. DAMPER SHAFTS SHALL BE TERMINATED IN LOCKING QUADRANTS. DAMPER BLADE EDGES SHALL BE BENT AND CENTER GROOVED FOR RIGIDITY.

FLEXIBLE SOUND DUCTWORK SHALL BE EQUAL TO JOHN-MANVILLE MICRO-AIRE ONE INCH THICK FLEXIBLE FIBERGLASS DUCT WITH FIRE-RESISTANT ALUMINUM PIGMENTED PLASTIC VAPOR BARRIER.

INSULATION

INTERIOR SUPPLY AND RETURN DUCTWORK EXPOSED WITHIN BUILDING SPACES SHALL BE INSULATED WITH TWO INCH RIGID 3 POUND DENSITY JOHN-MANVILLE INSULATION WITH TYPE "FSG" VAPOR BARRIER (R-6.3).

REFRIGERANT SUCTION AND CONDENSATE DRAIN PIPING SHALL BE INSULATED WITH ONE-HALF INCH THICK JOHN-MANVILLE AEROTUBE OR EQUAL AND SEALED WITH J-M 57 ADHESIVE.

INSULATION SHALL BE APPLIED ON CLEAN, DRY SURFACES. RUN INSULATION CONTINUOUSLY THROUGH WALL, FLOOR, ROOF, AND CEILING OPENINGS AND SLEEVES.

INSULATION PROTECTION SHIELDS OR SADDLES SHALL BE PROVIDED AT PIPE SUPPORTS.

INSULATION AND ACCESSORIES SHALL BE APPLIED AND FINISHED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFIED OTHERWISE.

PIPING

REFRIGERANT PIPING SHALL BE TYPE "L" COPPER UNLESS OTHERWISE INDICATED. ASSEMBLED WITH COPPER SOLDERING FITTINGS USING SILVER SOLDER. PIPING SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH REFRIGERATION EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. PIPING SHALL BE ASSEMBLED, ADHERING TO ACCEPTED INDUSTRY STANDARDS AND APPLICABLE CODES, INCLUDING THE MAINTENANCE OF PIPING CLEANLINESS AND PASSAGE OF DRY NITROGEN GAS THROUGH FITTINGS, ACCESSORIES AND/OR PIPING DURING BRAZING OPERATION.

CONDENSATE DRAIN PIPING SHALL BE TYPE "M" COPPER TUBING ASSEMBLED WITH WROUGHT COPPER SOLDERING FITTINGS USING 50-50 SOLDER, OR SCHEDULE 40 PVC PIPE AND FITTINGS.

GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL. PIPING TWO INCHES AND UNDER SHALL BE SCREEN FABRICATED AND PIPING TWO AND ONE-HALF INCHES AND OVER SHALL BE WELDED. PIPING RUN UNDERGROUND SHALL BE WELD REAPPED. PIPING RUN UNDERGROUND BENEATH BUILDING SHALL BE ENCASED IN PVC CONDUIT. GAS PIPING SHALL BE INSTALLED IN ACCORDANCE TO NFPA 54 NATION FUEL GAS CODE.

PIPING SHALL BE RUN CONCEALED UNLESS NOTED OTHERWISE.

WELDING PIPE RINGS SHALL BE UTILIZED AT WELDED PIPE JOINTS.

ALL FERROUS TO NON-FERROUS PIPING CONNECTIONS SHALL BE MADE WITH DIELECTRIC TYPE COUPLINGS OR FITTINGS.

PIPING SUPPORTS

SUPPORTS SHALL BE AS MANUFACTURED BY ELGEN, GRINNELL, FEE AND MASON OR APPROVED EQUAL.

SUPPORTS FOR UNINSULATED COPPER PIPING SHALL HAVE COPPER FINISH.

SUPPORT SPACING SHALL BE PER 2003 INC.

INTERMEDIATE SUPPORTS SHALL BE PROVIDED AT EQUIPMENT, PIPING SPECIALTIES AND AT PIPING DIRECTION CHANGES.

VALVES AND STRAINERS

GAS VALVES - FIGURE T-23 WITH TEFLON PLUNGER

EMERGENCY GAS SHUT-OFF VALVE - LUNKEWENHER FIGURE 805, WITH FIGURE 101 LOCK LEVER

PRESSURE GAUGES

PRESSURE GAUGES SHALL BE ASHROFT SERIES A TYPE 1920 OR EQUAL, FOUR AND ONE-HALF INCHES IN DIAMETER. GAUGES SHALL BE INSTALLED WITH ISOLATING PET-COCK TO PERMIT GAUGE REMOVAL.

TEST AND BALANCE

BALANCE SUPPLY, OUTSIDE AIR AND EXHAUST AIRFLOWS TO QUANTITIES INDICATED ON PLAN. SUPPLY AIR TO BE BALANCED AT THE REGISTERS.

REFRIGERANT ACCESSORIES

PROVIDE EXPANSION VALVES, SOLENOID VALVES, SERVICE VALVES, CHARGING VALVES, SITE GLASSES, STRAINERS, ETC., AS INDICATED OR REQUIRED FOR A COMPLETE INSTALLATION. ACCESSORIES SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH REFRIGERATION EQUIPMENT MANUFACTURER'S RECOMMENDATIONS. VALVES AND ACCESSORIES SHALL BE EQUAL TO SPORLAN AND HENRY.

SLEEVES

SCHEDULE 40 STEEL PIPE SLEEVES SHALL BE INSTALLED WHERE PIPING PASSES THROUGH MASONRY CONSTRUCTION. SET SLEEVES FLUSH WITH FINISHED SURFACES. INSIDE DIAMETER OF SLEEVES SHALL MATCH OUTSIDE DIAMETER OF COVERING.

ACCESS DOORS

THIS CONTRACTOR SHALL FURNISH AND THE GENERAL CONTRACTOR SHALL INSTALL ACCESS DOORS WHERE REQUIRED FOR ACCESS TO VALVES AND DAMPERS. PROVIDE SIZE & STYLE NECESSARY FOR SURFACE & FINITION.

CLEANING AND TESTING

AFTER THE INSTALLATION IS COMPLETE AND BEFORE FINAL ACCEPTANCE OF THE WORK, EACH SYSTEM SHALL BE CLEANED AND TESTED FOR PROPER OPERATION.

AIR SYSTEMS SHALL BE TESTED UNDER OPERATING CONDITIONS. AIR FLOWS FOR PARTS OF THE AIR SYSTEMS SHALL BE CONFIRMED AND COMPLETE TABULATIONS OF MEASURED AIR FLOWS AND TEMPERATURES AT OUTLETS AND INLETS SHALL BE SUBMITTED.

GAS PIPING SHALL BE LEAK TESTED FOR PREVAILING IFGC AND NFPA CODES.

EQUIPMENT SHALL BE TESTED IN OPERATION FOR A CONTINUOUS PERIOD OF NOT LESS THAN 48 HOURS.

AUTOMATIC CONTROL SYSTEMS SHALL BE ADJUSTED AND TESTED TO ASSURE SATISFACTORY OPERATION THROUGH EVERY CYCLE OF OPERATION. SAFETY CONTROLS SHALL BE TESTED TO ASSURE PERFORMANCE OF THEIR REQUIRE FUNCTION.

DEFECTS IN THE WORK PROVIDED SHALL BE CORRECTED AND THE TESTS REPEATED AT NO ADDITIONAL COST TO THE OWNER.

THE ARCHITECT/ENGINEER SHALL BE GIVEN 48 HOURS NOTICE BEFORE TESTS ARE MADE. THE CONTRACTOR SHALL FURNISH THE ARCHITECT A CERTIFICATE OF APPROVAL FROM THE LOCAL INSPECTION AUTHORITY HAVING JURISDICTION.

SYSTEM CHECKOUT

AFTER BALANCING AND ADJUSTMENT OPERATIONS HAVE BEEN COMPLETED, CONTRACTOR SHALL CONDUCT SYSTEM CHECK TEST TO PROVE TO SATISFACTION OF ARCHITECT/ENGINEER THAT ALL SYSTEMS ARE PERFORMING AS SPECIFIED.

AT TIME TEST IS CONDUCTED, THE FOLLOWING PERSONNEL SHALL BE PRESENT:

- ARCHITECT/ENGINEER
- OWNER
- MECHANICAL CONTRACTOR, INCLUDING:
 - SHEETMETAL SUB-CONTRACTOR
 - ELECTRICAL SUB-CONTRACTOR
 - TEMPERATURE CONTROL SUB-CONTRACTOR
- OTHER TRADES AS MAY BE REQUIRED TO SUCCESSFULLY CONDUCT TESTS.

THE CHECKOUT TEST SHALL INCLUDE, BUT SHALL NOT BE LIMITED TO, THE FOLLOWING:

- OPERATION OF ALL EQUIPMENT.
- VISUAL PERFORMANCE CHECK ON TEMPERATURE CONTROL SYSTEM INCLUDING DAMPER OPERATION AND ON-OFF OPERATION OF EQUIPMENT.
- SPOT CHECK OF TESTING AND BALANCING REPORT.
- CHECK OF PERTINENT POINTS OF EQUIPMENT OPERATION.

LABOR, MATERIAL AND INSTRUMENTS REQUIRED FOR CHECK TEST SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO OWNER. ANY CUTTING OF DUCTWORK OR INSULATION REQUIRE DURING TEST SHALL BE REPAIRED TO THE SATISFACTION OF THE ARCHITECT/ENGINEER.

OPERATING AND MAINTENANCE INSTRUCTIONS

FURNISH COMPLETE DIAGRAMS, INSTRUCTIONS AND ORAL INSTRUCTION TO THE OWNER FOR THE OPERATION AND MAINTENANCE OF THE SYSTEMS AND COMPONENTS PARTS, INCLUDING THE AUTOMATIC CONTROL SYSTEM. THESE SHALL ALSO BE INCLUDED WITHIN A THREE-RING BINDER WITH THE RECORD DRAWINGS AND DELIVERED TO THE GENERAL CONTRACTOR FOR THE ARCHITECT/ENGINEER.

WARRANTY AND SERVICE

THIS CONTRACTOR SHALL FURNISH A WRITTEN WARRANTY, CONTINGENT AND GUARANTEED BY THE GENERAL CONTRACTOR AGAINST DEFECTS OF EQUIPMENT, MATERIAL, OR WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. DEFECTS DEVELOPING DURING THAT PERIOD SHALL BE CORRECTED WITHOUT COST TO THE OWNER.

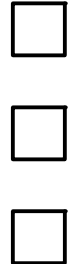
THIS CONTRACTOR SHALL SERVICE THE INSTALLATION FOR ONE YEAR FROM DATE OF FINAL ACCEPTANCE. THIS SHALL INCLUDE EMERGENCY SERVICE AND ADJUSTMENT, WITH THE EXCEPTION OF THE OILING OF MOTORS AND CLEANING OF FILTER AND SCREENS.

CONTROLS AND INSTRUMENTATION

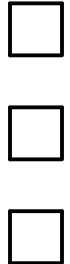
HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT SHALL BE CONTROLLED AS INDICATED ON THE DRAWINGS AND AS SPECIFIED HEREIN.



H U D S O N & A S S O C I A T E S
A R C H I T E C T S
150 WEST QUEEN HWY SUITE 201 HAWTHORN, VA
(703) 722-1044 23689



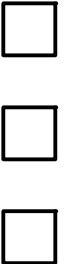
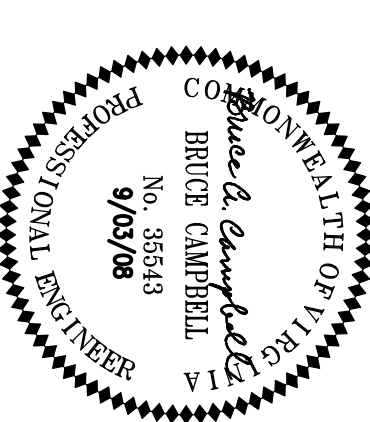
BROGDEN LANE
1C/MR HOME
FOR HNN C5B



2712 SOUTHERN BLVD., SUITE 201
VIRGINIA BEACH, VIRGINIA 23462
PHONE: 757.253.3851
FAX: 757.253.6419
EMAIL: information@pmedg.com



SEPTEMBER 3, 2008



SPECIFICATIONS -
MECHANICAL

REVISION DATE
9/30/08



J O B N U M B E R 0 7 0 4
M3.01