ELECTRICAL SPECIFICATIONS:

I. GENERAL:

A. THE WORK UNDER THIS SECTION SHALL INCLUDE LABOR, MATERIALS AND EQUIPMENT FOR THE INSTALLATION OF ALL ELECTRICAL WORK AS SHOWN ON THE DRAWINGS OR SPECIFIED. ALL WORK SHALL COMPLY WITH THE 2011 NATIONAL ELECTRICAL CODE AND LOCAL CODES. THE WORK SHALL BE NEATLY AND SECURELY INSTALLED ACCORDING TO GOOD COMMERCIAL PRACTICE.

B. GENERALLY, THE WORK SHALL INCLUDE FURNISHING AND INSTALLING ALL POWER, WIRING, ALL LIGHTING FIXTURES (COMPLETE WITH LAMPS AS SCHEDULED), EQUIPMENT AND ANY OTHER WORK SHOWN ON THE ACCOMPANYING DRAWINGS.

C. THE DRAWINGS SHOW APPROXIMATE LOCATIONS OF VARIOUS CONDUITS, PANELBOARDS AND THEIR ARRANGEMENT AND CONTROL. THE EXACT LOCATIONS SHALL BE DETERMINED BY REFERENCE TO THE GENERAL BUILDING PLANS AND BY ACTUAL MEASUREMENT IN THE FIELD AND WILL, IN ALL CASES, BE SUBJECT TO THE APPROVAL OF THE ENGINEER.

D. THE OWNER RESERVES THE RIGHT TO MAKE ANY REASONABLE CHANGES IN THE LOCATIONS SHOWN ON THE PLANS WITHOUT ADDED COST TO OWNER PROVIDED SUCH CHANGES OCCUR PRIOR TO ACTUAL INSTALLATION.

E. CIRCUITS, OUTLETS, SWITCH LEGS, "HOME RUNS", ETC., ARE OF NECESSITY DISTRIBUTED AS SHOWN ON THE DRAWINGS, BUT ACTUAL INSTALLATION SHALL FOLLOW AS CLOSELY AS POSSIBLE AS INDICATED. DEVIATIONS ARE ALLOWED TO SUIT STRUCTURAL AND ARCHITECTURAL REQUIREMENTS AND TO KEEP WITHIN GOOD PRACTICE AND WORKMANSHIP.

F. CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH THE EXISTING SITE CONDITIONS DURING THE BIDDING STAGE. INFORM THE ENGINEER OF ANY CONTINGENCIES WHICH INFLUENCE THE EXECUTION OF THE WORK. NO EXTRAS WILL BE ALLOWED DUE TO FAILURE TO MAKE THE ABOVE EXAMINATION OR NEGLECT TO INCLUDE ALL MATERIAL, EQUIPMENTS AND LABOR REQUIRED TO PROPERLY COMPLETE THE PROJECT.

II. REQUIREMENTS OF REGULATORY AGENCIES:

A. THE EQUIPMENT FURNISHED SHALL BE LISTED BY U.L. OR OTHER NATIONALLY RECOGNIZED TESTING LABORATORY WHERE AVAILABLE. ARRANGE, PAY FEES FOR, AND COMPLETE WORK TO PASS REQUIRED TESTS BY AGENCIES HAVING AUTHORITY OVER THIS WORK. ELECTRICAL WORK SHALL BE INSTALLED IN ACCORDANCE WITH DRAWINGS AND SPECIFICATIONS WITH THE NATIONAL ELECTRICAL CODE, WITH STATE AND LOCAL ELECTRICAL BUILDING CODES, AND WITH SPECIAL CODES HAVING JURISDICTIONS OVER SPECIFIC PORTIONS WITHIN THE COMPLETE INSTALLATION. IN THE EVENT OF CONFLICT BETWEEN DRAWINGS, SPECIFICATIONS AND SUCH CODES, CONTRACTOR SHALL PRICE THE MOST STRINGENT, AND FINAL RULING SHALL BE REQUESTED OF THE ENGINEER.

III. SUBMITTALS:

A. SHOP DRAWINGS SUBMITTAL AND REVIEW ARE INTENDED TO SHOW THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT. SUBMITTALS DEMONSTRATE THAT THE CONTRACTOR UNDERSTANDS THE MATERIALS AND FABRICATION, AND CONSTRUCTION METHODS TO BE USED. SUBMITTALS ARE NOT INTENDED TO MODIFY OR CHANGE THE CONTRACT DOCUMENTS.

B. SUBMIT SIX (6) OR MORE FOR ITEMS LISTED BELOW.

LIGHTING FIXTURES.
WIRING DEVICES.
DEVICE PLATES.
PANELBOARDS
DISCONNECTS

C. SHOP DRAWINGS AND SUBMITTAL SHALL BEAR THE STAMP OF APPROVAL OF THE CONTRACTOR AS EVIDENCE THAT THEY HAVE BEEN CHECKED BY HIM.

IV. WIRING DEVICES AND BOXES:

A. WIRING DEVICES SHALL BE PASS & SEYMOUR OR APPROVED EQUAL. PROVIDE P&S S-00 SERIES DEVICE PLATES. SWITCHES SHALL BE AS FOLLOWS (P&S CATALOG NUMBERS):

P & S #660IG SINGLE POLE
P & S #663IG THREE WAY

B. LIGHT SWITCHES SHALL BE INSTALLED AS INDICATED ON THE DRAWINGS. LIGHT SWITCHES SHOWN ON THE DRAWINGS NEXT TO THE DOORS SHALL BE WITHIN (8) INCHES OF THE FRAME WHERE POSSIBLE. SWITCHES ARE TO BE MOUNTED AT 48" AFF UNLESS NOTED OTHERWISE.

C. WIRING DEVICES SHALL BE PASS & SEYMOUR OR APPROVED EQUAL. RECEPTACLES SHALL BE AS FOLLOWS (P&S CATALOG NUMBERS):

STANDARD, DUPLEX, 20 AMP, 125V-CRB5362
GROUND FAULT INTERRUPTER 20 AMP, 125V 2095
PROVIDE SAME TYPE PLATES FOR RECEPTACLES AND TELEPHONE OUTLETS AS SPECIFIED FOR SWITCHES.

D. RECEPTACLES SHALL BE INSTALLED AS INDICATED ON THE DRAWING. RECEPTACLES ARE TO BE MOUNTED AT 18" AFF UNLESS NOTED OTHERWISE. IN SOME CASES THE OUTLETS MAY BE BELOW CABINET COUNTER-TOP. GROMMETS IN THE TOP SHALL BE PROVIDED BY MILLWORK SUPPLIER TO ACCESS OUTLETS.

E. RECEPTACLES SHOWN ON THE DRAWINGS AS SPECIAL MOUNTING HEIGHT SHALL BE INSTALLED AT MOUNTING HEIGHT AS INDICATED ON THE DRAWINGS. WHERE NO MOUNTING HEIGHT IS GIVEN AND RECEPTACLES ARE ABOVE COUNTERS, THEY SHALL BE MOUNTED WITH CENTERS EIGHT (8) INCHES ABOVE TOP OF COUNTER.

F. OUTLETS AND JUNCTION BOXES SHALL BE NATIONAL, APPLETON, RACO, GENERAL ELECTRIC, OR STEEL CITY.

G. PROVIDE WIRING DEVICES AND FIXTURES WITH AN OUTLET BOX. USE GALVANIZED STEEL FOR CONCEALED BOXES. OUTLET BOXES SHALL BE SECURELY ANCHORED, SET TRUE AND PLUMB, AND NO PART OF BOX OR COVER SHALL EXTEND BEYOND FINISHED WALL AND CEILING. SELECT BOXES ACCORDING TO INTENDED USE AND TYPE OF OUTLET. PROVIDE PLASTER OR MASONRY RINGS OR FLUSH MOUNTED OUTLETS TO CONCEAL JOINT BETWEEN BOX AND WALL FINISH MATERIAL. PROVIDE JUNCTION BOXES AS SHOWN ON DRAWING AND OTHERWISE WHERE REQUIRED, SIZE ACCORDING TO NUMBER OF CONDUCTORS IN BOX OR TYPE OF SERVICE TO BE PROVIDED.

V. CONDUIT:

A. ALL CONDUIT RUN SHALL BE GALVANIZED WITH WATER TIGHT COUPLINGS AND CONNECTORS. THE SERVICE AND FEEDERS SHALL BE IN METALLIC CONDUIT WHERE IT RUNS ABOVE GRADE.

B. CONDUIT AND CABLES INSIDE THE BUILDING SHALL BE CONCEALED, WHERE POSSIBLE, EXCEPT WHERE THEY ENTER THE SURFACE MOUNTED PANELS.

C. RIGID CONDUIT, INTERMEDIATE METALLIC CONDUIT, AND ELECTRICAL METALLIC TUBING SHALL BE HOT DIPPED, ELECTRO-GALVANIZED STEEL BY WHEATLAND, GENERAL ELECTRIC, ALLIED, TRIANGLE, OR REPUBLIC.

D. USE ELECTRICAL METALLIC TUBING WHERE DRAWINGS CALL FOR CONDUIT TO BE CONCEALED IN WALLS, RUN EXPOSED AND INSTALL ABOVE SUSPENDED CEILING. INSTALL BRANCH CIRCUIT AND FEEDER WIRING IN CONDUIT. COMPLY WITH NATIONAL ELECTRICAL CODE AND LOCAL AUTHORITIES HAVING JURISDICTION INCLUDING GROUNDING AND SUPPORTING ARRANGEMENTS.

E. USE PROPER SIZE TOOLS FOR BENDING. DO NOT HEAT CONDUIT. CONDUIT SHALL BE SUPPORTED DIRECTLY FROM THE BUILDING STRUCTURE. USE CADDY CLIPS, CONDUIT STRAPS OR OTHER STEEL SUPPORTS DESIGNED FOR THE PURPOSE.

F. CONNECTORS AND COUPLINGS FOR ELECTRICAL METALLIC TUBING SHALL BE ALL STEEL EQUAL TO T AND B 5000 SERIES AND SHALL BE RAIN TIGHT COMPRESSION FITTINGS.

VI. CONDUCTORS (COPPER):

A. CONDUCTORS FOR BRANCH CIRCUITS AND FEEDERS SHALL BE 600 VOLT COPPER BY ANACONDA, GENERAL CABLE, GENERAL ELECTRIC, OKONITE, RONE, OR TRIANGLE. FOR CONTROL AND SYSTEMS, USE STRANDED COPPER, #14 GAUGE CONDUCTOR LABELED "THHN" OR "THWN". USE SOLID COPPER CONDUCTORS LABELED "THHN" OR "THWN" FOR #12 AND #10 GAUGE. USE STRANDED COPPER, TYPE THW FOR CONDUCTORS #8 AND LARGER.

B. NO CONDUCTOR FOR BRANCH CIRCUIT WIRING SHALL BE SMALLER THAN #12.

VII. LIGHTING FIXTURES:

A. PROVIDE FIXTURES AS SPECIFIED ON PLANS. MOUNT FIXTURES AS CALLED FOR IN SCHEDULE ON DRAWINGS. DETERMINE TYPE OF CEILING TO BE INSTALLED IN EACH SPACE FROM THE ARCHITECTURAL DRAWINGS AND SCHEDULES, AND FURNISH FIXTURES SUITABLE FOR THE EXACT TYPE.

B. LIGHT FIXTURES SHALL BE LOCATED AS SHOWN ON THE ARCHITECTURAL REFLECTED CEILING PLAN.

VIII. DATA/COMMUNICATION SYSTEMS:

A. ALL DATA LINE OUTLETS SHOWN ON THE PLANS SHALL CONSIST OF A BACKBOX (WITH TEMPORARY COVER PLATE) IN WALL AND (1) 3/4" CONDUIT EXTENDING TO ABOVE LAY-IN CEILING, PROVIDE PULL STRING. DATA OUTLET COVER PLATE SHALL ACCOMMODATE COMPUTER, PRINTER MODEM AND TELEPHONE, FINAL COVER PLATE AND WIRING BY OTHERS. DATA/COMMUNICATION BOXES SHALL BE MOUNTED AS CLOSE TO THE ELECTRICAL OUTLET AS POSSIBLE. PROVIDE ADDITIONAL BLOCKING TO ACCOMMODATE THIS CONDITION IF REQUIRED.

IX. PANELBOARDS:

A. FURNISH AND INSTALL ELECTRICAL PANELBOARDS IN THE LOCATIONS SHOWN ON THE DRAWINGS. THESE PANELBOARDS SHALL BE ARRANGED FOR SURFACE OR FLUSH MOUNTING AS REQUIRED BY LOCATION AND/OR INDICATED ON THE DRAWINGS. THEY SHALL BE OF CODE GAUGE CABINETS AND FRONTS. THEY SHALL BE FOR CONNECTION TO SERVICE INDICATED WITH LUGS IN MAINS, OR BREAKERS IN MAINS WITH COPPER BUSSING AS SHOWN ON PANEL SCHEMATICS. THEY SHALL BE OF SAFETY DEAD FRONT TYPE CONSTRUCTION WITH MOLDED CASE CIRCUIT BREAKER BRANCHES. MULTIPLE POLE BREAKERS SHALL BE COMMON TRIP TYPE. ALL BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE, QUICKBREAK OPERATION. THE ABOVE PANELBOARDS SHALL BE GENERAL ELECTRIC NLAB, NAB, NHB OR CCB, SIZED FOR LOADS SERVED. APPROVED EQUAL BY SQUARE D, ITE OR WESTINGHOUSE.

B. PANELBOARDS SHALL BE COMPLETE WITH ALL BRANCHES SHOWN ON SCHEMATICS. TRIP RATING AND FEEDER SHALL BE SATISFACTORY FOR CONTINUOUS OPERATION OF CONNECTED LOADS. DIRECTORIES SHALL BE FILLED OUT WITH A TYPEWRITER. BREAKERS NOT SIZED SHALL BE 20 AMP. BREAKERS NOT LOADED SHALL BE SPARES UNLESS DESIGNATED AS SPACES.

C. INTERRUPTING RATINGS SHALL BE AS SHOWN ON THE DRAWINGS. VERIFY EXISTING CIRCUITS TO REMAIN WHETHER SHOWN ON THE DRAWINGS. PROVIDE NECESSARY BREAKERS TO SERVE ANY REMAINING EQUIPMENT.

D. BREAKERS DESIGNATED GFI TO BE GROUND FAULT INTERRUPTERS.

X. SAFETY SWITCHES:

A. OUTDOOR SWITCHES SHALL BE GENERAL ELECTRIC TYPE HEAVY DUTY TYPE TH IN NEMA TYPE 3R RAINTIGHT ENCLOSURES. VOLTAGE RATING SHALL BE IN KEEPING WITH SERVICE VOLTAGE. APPROVED EQUAL SWITCHES BY SQUARE D OR WESTINGHOUSE WILL BE ACCEPTABLE.

B. INDOOR SWITCHES SHALL BE GENERAL ELECTRIC TYPE HEAVY DUTY TYPE TH IN NEMA 1 ENCLOSURES. VOLTAGE RATINGS SHALL BE IN KEEPING WITH SERVICE VOLTAGE. APPROVED EQUAL SWITCHES BY SQUARE D OR WESTINGHOUSE WILL BE ACCEPTABLE.

C. FUSES SHALL BE BUSSMAN "FUSETRON", U.L. LABELED FUSES OF THE VOLTAGE AND CURRENT RATING REQUIRED OR APPROVED EQUAL BY CHASE SHAWMUT. CURRENT LIMITING FUSES SHALL BE PROVIDED WHERE CALLED FOR ON PLANS.

XI. IDENTIFICATION AND MARKINGS:

A. LEGIBLY MARK EACH DISCONNECTING MEANS FOR MOTORS AND APPLIANCES AND EACH FEEDER, SERVICE OR BRANCH CIRCUIT, AT POINT WHERE IT ORIGINATES, TO INDICATE ITS PURPOSE. MARKINGS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND ENVIRONMENT INVOLVED.

B. EACH PANELBOARD, LIGHTING PANEL AND LOAD CENTER SHALL HAVE A CIRCUIT DIRECTORY FRAME AND CARD WITH A CLEAR PLASTIC COVER LOCATED INSIDE THE DOOR. THE DIRECTORY CARD SHALL BE TYPED AND IDENTIFY THE LOAD FEED BY EACH CIRCUIT. EACH PANEL SHALL BE PERMANENTLY MARKED AND IDENTIFIED WITH PANEL IDENTIFICATION AS DESIGNATED ON THE DRAWINGS.

C. FINAL APPROVAL AND ACCEPTANCE OF THE WORK WILL BE SUBJECT TO ALL IDENTIFICATION BEING COMPLETE AND IN PLACE TO CLEARLY DISTINGUISH ALL EQUIPMENT AND CIRCUITS.

XII. PAINTING:

A. PAINT ALL UNFINISHED SURFACES ON PANELBOARDS, EQUIPMENT FURNISHED BY THE CONTRACTOR AND PIPE HANGERS WHICH ARE EXPOSED TO VIEW. PAINT COLOR SHALL BE AS DIRECTED BY ENGINEERS.

XIII. GUARANTEE:

A. THE ELECTRICAL CONTRACTOR SHALL GUARANTEE, IN WRITING, THAT ALL ELECTRICAL WORK AND MATERIALS PROVIDED SHALL BE LEFT IN PERFECT WORKING CONDITION AND THAT HE WILL REPLACE, WITHOUT CHARGE TO THE OWNER, ANY ELECTRICAL WORK OR MATERIALS THAT MAY BE DEFECTIVE WITHIN ONE (1) YEAR OF THE FINAL ACCEPTANCE OF HIS WORK.

PLUMBING SPECIFICATIONS:

I. GENERAL:

A. CONTRACTOR SHALL FURNISH LABOR, MATERIALS, TOOLS, AND SERVICES FOR A COMPLETE INSTALLATION OF THE EQUIPMENT AND PIPING SYSTEMS AS SHOWN ON THE CONSTRUCTION DOCUMENTS.

B. CONTRACTOR SHALL COORDINATE WITH ALL TRADES THE PLACEMENT OF EQUIPMENT AND ROUTING OF PIPING TO AVOID CONFLICTS. INSTALLATION OF EQUIPMENT AND MATERIALS SHALL BE NEAT IN APPEARANCE.

C. CONTRACTOR SHALL VISIT SITE AND BECOME FAMILIAR WITH THE EXISTING SITE CONDITIONS DURING THE BIDDING STAGE. INFORM THE ENGINEER OF ANY CONTINGENCIES WHICH INFLUENCE THE EXECUTION OF THE WORK. NO EXTRAS WILL BE ALLOWED DUE TO FAILURE TO MAKE THE ABOVE EXAMINATION OR NEGLECT TO INCLUDE ALL MATERIAL, EQUIPMENTS AND LABOR REQUIRED TO PROPERLY COMPLETE THE PROJECT.

II. CODES AND STANDARDS:

CONTRACTOR SHALL PERFORM ALL WORK IN ACCORDANCE TO THE FOLLOWING STANDARDS AND CODES AND ASSOCIATED PUBLICATIONS AS A MINIMUM:

A. INTERNATIONAL BUILDING CODE
B. INTERNATIONAL PLUMBING CODE
C. AMERICAN DISABILITY ACT (ADA)
D. INDUSTRY STANDARDS

III. SUBMITTAL:

A. CONTRACTOR SHALL SUBMIT SIX (6) SETS OF SHOP DRAWINGS, EQUIPMENT AND MATERIALS BROCHURES FOR APPROVAL PRIOR TO INSTALLATION.

B. SUBMITTAL SHALL BE SECURELY BOUND, CLEARLY MARKED AND CATALOGED AND TRANSMITTED TO THE ENGINEER.

C. SUBMITTAL SHALL BE CHECKED AND STAMPED "APPROVED" BY THE CONTRACTOR PRIOR TO TRANSMITTING TO THE ENGINEER FOR HIS APPROVAL.

IV. PRODUCT:

A. CONTRACTOR TO CAREFULLY EXAMINE ARCHITECTURAL AND EQUIPMENT DRAWINGS TO ENSURE THAT HE IS FURNISHING ALL FIXTURES AND RELATED ITEMS REQUIRED TO BE PROVIDED AND INSTALLED UNDER THIS SECTION. ALL ITEMS SHALL BE LOCATED AND INSTALLED IN ACCORDANCE WITH THESE PLANS AND/OR APPROVED MANUFACTURER'S ROUGH-IN DRAWINGS.

B. CONTRACTOR SHALL PROVIDE AND INSTALL FIXTURES, TRIMS, AND RELATED ITEMS SUCH AS SUPPLIES, TRAPS, DRAINS, CLEANOUTS, WATER CLOSET SEATS AND COVERS, FIXTURE SUPPORTS AND OTHER ACCESSORY ITEMS.

C. PLUMBING FIXTURES AND TRIM SHALL BE MANUFACTURED BY AMERICAN STANDARD, ELJER, KOHLER, CHICAGO, ELKAY, JUST, T&S BRASS, OR APPROVED EQUAL.

D. TOILET SEATS SHALL BE MANUFACTURED BY OLSONITE, BENEKE, BEMIS OR APPROVED EQUAL.

E. VALVES SHALL BE MANUFACTURED BY NIBICO, SOCKHAM, CRANE, OR APPROVED EQUAL.

F. CAULKING SHALL BE BY GENERAL ELECTRIC SILICON SANITARY SEALANT OR APPROVED EQUAL.

G. LAVATORIES AND SINKS SHALL BE FURNISHED COMPLETE WITH MOUNTING BRACKETS AND ASSOCIATED HARDWARE.

H. FIXTURES SHALL BE WHITE UNLESS SPECIFIED OTHERWISE.

V. PIPE, FITTINGS, AND VALVES:

A. DOMESTIC WATER PIPING: SHALL BE TYPE "L" COPPER TUBING.

B. SANITARY WASTE PIPING: PROVIDE SCHEDULE 40 PVC NO-HUB PIPE AND FITTINGS.

C. SANITARY VENT PIPING: PIPING SHALL BE SCHEDULE 40 PVC PIPING.

D. INSULATION: INSULATE ALL DOMESTIC WATER PIPING WITH FACTORY FORMED FIBERGLASS INSULATION WITH FACTORY FORMED ALL SERVICE JACKET. INSULATE ALL DOMESTIC WATER PIPING WITH 1" THICK INSULATION.

VI. EXECUTION:

A. MATERIAL AND INSTALLATION SHALL BE AS REQUIRED BY STATE AND STANDARD CODES AND INDUSTRY STANDARDS.

B. DRAIN AND VENT PIPING SHALL BE INSTALLED AT A UNIFORM GRADE PER THE STANDARD PLUMBING CODE.

C. CONTRACTOR SHALL CAULK AROUND ALL FLOOR OR WALL MOUNTED FIXTURES.

D. SECURELY SUPPORT ALL OVERHEAD PIPING WITH PIPE TYPE HANGERS FROM STRUCTURE. DO NOT SUPPORT PIPING FROM OTHER PIPING ON EQUIPMENT.

VII. TEST AND CLEANING:

A. FLUSH AND TEST DOMESTIC WATER PIPING AT 1-1/2 TIME OPERATING PRESSURE, MINIMUM OF 150 PSIG.

B. FLUSH AND TEST SANITARY AND VENT PIPING AT 10 FEET OF HEAD.

C. CORRECT ALL DEFICIENCIES FOUND AND RETEST.

D. TURN ALL WORK OVER TO OWNER IN A CLEAN, SANITARY, AND OPERABLE CONDITION.

VIII. GUARANTEE:

A. THE PLUMBING CONTRACTOR SHALL GUARANTEE, IN WRITING, THAT ALL PLUMBING WORK AND MATERIALS PROVIDED SHALL BE LEFT IN PERFECT WORKING CONDITION AND THAT HE WILL REPLACE, WITHOUT CHARGE TO THE OWNER, ANY PLUMBING WORK OR MATERIALS THAT MAY BE DEFECTIVE WITHIN ONE (1) YEAR OF THE FINAL ACCEPTANCE OF HIS WORK.

HVAC SPECIFICATIONS:

I. GENERAL:

A. THE WORK UNDER THIS SECTION SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT, ETC., AS SHOWN ON THE DRAWINGS & SPECIFIED HEREINAFTER, WHICH CONSTITUTES THE HVAC WORK. GENERALLY, IT INCLUDES THE INSTALLATION OF AIR CONDITIONING UNITS WITH DX COOLING, ELECTRIC HEATING, EXHAUST FANS, REQUIRED CONTROLS, ALL DUCTWORK FOR THE AIR DISTRIBUTION AND EXHAUST SYSTEMS IN THE BUILDING AND FINAL BALANCING OF THE AIR QUANTITIES AS SHOWN ON THE DRAWINGS.

B. CONTRACTOR SHALL BECOME FAMILIAR WITH THE DRAWINGS DURING THE BIDDING STAGE. INFORM THE ENGINEER OF ANY CONTINGENCIES WHICH INFLUENCE THE EXECUTION OF THE WORK. NO EXTRAS WILL BE ALLOWED DUE TO FAILURE TO MAKE THE ABOVE EXAMINATION OR NEGLECT TO INCLUDE ALL MATERIAL, EQUIPMENTS AND LABOR REQUIRED TO PROPERLY COMPLETE THE PROJECT.

II. EQUIPMENT:

A. FURNISH AND INSTALL, ESSENTIALLY AS SHOWN ON THE DRAWINGS, AIR CONDITIONING UNITS, WHICH SHALL INCLUDE UNITS SCHEDULED AND DETAILED ON THE PLANS. EACH UNIT SHALL BE EQUIPPED WITH ALL NECESSARY CONTROLS, DUCTS, GRILLES AND ACCESSORIES TO CONSTITUTE A FULLY FUNCTIONAL SYSTEM. THE CONTRACTOR SHALL FOLLOW CLOSELY THE SCHEMATIC DRAWINGS, SCHEDULES AND DETAILS IN ARRANGING THE UNITS WITHIN THE SPACE ALLOTED. ANY SUBSTITUTIONS SHALL CAUSE SYSTEM TO BE INSTALLED AT THE CONTRACTOR'S EXPENSE. SCHEDULES ON DRAWINGS SHOW EQUIPMENT USED.

III. DUCTWORK:

A. CONTRACTOR SHALL FURNISH AND INSTALL COMPLETE, ESSENTIALLY AS SHOWN ON THE DRAWINGS, ALL AIR DUCTS NECESSARY FOR THE AIR CONDITIONING OF THE SPACES AS SHOWN. ALL DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED ACCORDING TO ACCEPTED PRACTICE.

B. DUCTWORK SHALL BE FABRICATED OF GALVANIZED STEEL EXCEPT FOR FLEXIBLE DUCT CONNECTIONS TO AIR TERMINAL DEVICES. FABRICATE DUCTWORK PER SMACNA STANDARDS. DUCTWORK SHALL BE EXTERNALLY INSULATED WITH R-6 INSULATION. INSULATION SHALL COMPLY WITH IECC.

C. THE FINAL CONNECTION FROM LOW VELOCITY DUCT TO SUPPLY AIR CEILING DIFFUSERS SHALL BE MADE WITH FLEXMASTER TYPE 8M PREINSULATED FLEXIBLE DUCT, U.L. 181 CLASS 1 COMPLYING WITH NFPA 90A. DUCT SHALL BE OF AN INNER CORE OF HOT-DIPPED GALVANIZED STEEL CLOSELY CORRUGATED. AN INSULATING LAYER OF FIBERGLASS PROVIDING A THERMAL CONDUCTANCE OF 0.23 BTU/HR./SQ.FT. @ 75 F. SHALL BLANKET THE INNER CORE AND BE SHEATHED WITH A SEAMLESS CLASS I PVC SKIN. MAXIMUM LENGTH IS 6 FT. SUPPORT AT 4 FT. ON CENTERS WITH GALVANIZED 26 GAUGE STEEL BAND, ONE INCH WIDE. AVOID EXCESSIVE SAGGING OR BENDS, TRIMMING AS REQUIRED. "SPIN-IN" CONNECTIONS TO DUCTWORK SHALL BE FLEXMASTER SERIES 3000S WITH DAMPER. CLAMP FLEX DUCT TO CONNECTIONS WITH QUICK RELEASE STAINLESS STEEL CLAMPS.

D. PROVIDE ALL DUCTWORK ACCESSORY DEVICES NECESSARY TO BALANCE THE AIR FLOW TO THE QUANTITIES SHOWN ON THE DRAWINGS UNDER FULL FLOW CONDITIONS. THESE SAME DEVICES SHALL ALLOW ADJUSTMENT OF THE AIR QUALITIES INDICATED AS SUCH ADJUSTMENT MAY BE REQUIRED TO OBTAIN OPTIMUM SYSTEM PERFORMANCE. SUCH DEVICES SHALL BE AS SPECIFIED, AS INDICATED ON THE DRAWINGS, AND AS OTHERWISE REQUIRED FOR BALANCING AND ADJUSTING THE FLOW.

E. ALL TURNING BLADES IN LOW VELOCITY DUCTWORK SHALL BE NOT LESS THAN 22 GAUGE. TURNING VANES SHALL BE INSTALLED ON ALL SQUARE TURNS AND WHERE INDICATED ON THE DRAWING.

IV. PIPING:

A. CONDENSATE LINES SHALL BE SCHEDULE 40 PVC. INSULATE ALL LINES IN THE BUILDING.

V. BALANCING DAMPERS:

A. PROVIDE DAMPERS WHERE SHOWN ON DRAWINGS AND WHEREVER NECESSARY FOR COMPLETE CONTROL OF AIR FLOW, INCLUDING ALL SUPPLY AND RETURN BRANCHES, "DIVISIONS" IN MAIN SUPPLY AND RETURN DUCTS, EACH INDIVIDUAL AIR SUPPLY OUTLET AND OUTSIDE AIR DUCTS. WHERE ACCESS TO DAMPERS THROUGH A SUSPENDED CEILING IF NECESSARY, COORDINATE THE PROPER LOCATION OF THE ACCESS DOORS.

B. SPLITTER DAMPERS: FABRICATE OF STEEL NOT LIGHTER THAN 16 GAUGE, WITH LEADING EDGE OF DAMPER HEMMED. EACH SPLITTER SHALL BE LARGE ENOUGH TO COMPLETELY COVER THE SMALLER OF THE TWO BRANCHES IT CONTROLS. DAMPERS SHALL BE CAREFULLY FITTED, AND CONTROLLED BY LOCKING QUADRANTS. PROVIDE YOUNG REGULATOR OR VENTLOK AND BEARINGS FOR THE DAMPER ROD.

C. VOLUME DAMPERS:

1. SUPPLY DUCTS: OPPOSED BLADE INTERLOCKING TYPE, MULTI-BLADE FOR DUCT HEIGHT 12" AND LARGER, SINGLE BLADE FOR DUCT HEIGHT UNDER 12". BLADES SHALL BE OF NOT LESS THAN 16 GAUGE GALVANIZED STEEL, MAXIMUM 48" LENGTH AND 6" WIDTH, SUPPORTED ON SHAFTS WITH SELF-LUBRICATING BEARINGS. FRAME SHALL BE MINIMUM OF 2"x1/2"x1/8"(OR 20 GAUGE) GALVANIZED STEEL. DAMPERS SHALL BE FACTORY MADE BY RUSKIN, APC INC., AIR BALANCE INC., OR APPROVED EQUAL.

2. LOCATIONS OTHER THAN SUPPLY DUCTS: OPPOSED BLADE TYPE OF SAME CONSTRUCTION AS DESCRIBED ABOVE FOR SUPPLY DUCTS, EXCEPT MAY BE EITHER FACTORY OR SHOP MADE.

D. DAMPER REGULATORS:

1. INSULATED DUCT: VENTLOK No. 637 OR 638 SELECTED FOR INSULATION THICKNESS.

2. UNINSULATED DUCT: VENTLOK No. 620, 635 OR 555-1/2", SELECTED FOR ROD SIZE.

3. SPLITTER DAMPERS LARGER THAN 3 SQ. FEET: VENTLOK No. 690 SELF-LOCKING SPLITTER DAMPER ASSEMBLY.

4. DAMPERS BEHIND INACCESSIBLE WALL OR CEILINGS: VENTLOK No. 688 OR YOUNG REGULATOR No. 315, CHROME PLATED. OBTAIN APPROVAL BY ARCHITECT BEFORE LOCATING.

E. BRANCH TAKE-OFFS (NOT CONTROLLED BY SPLITTER DAMPERS):

1. RECTANGULAR BRANCH OR SIDEWALL GRILLE: PROVIDE EXTRACTOR EQUAL TO TITUS AG-45. FOR BRANCH DUCT WIDER THAN 12", PROVIDE TITUS XY-2644-1 NYLON ROLLER SUPPORT ON END OF EXTRACTOR. FOR SIDE-WALL GRILLE TAKE-OFF BOOT SHORTER THAN 30", PROVIDE TITUS No. 3 OPERATOR; FOR ALL OTHER CASES, PROVIDE No. 2 OPERATOR WITH CONTROL AS SPECIFIED FOR SPLITTER DAMPER. ALTERNATELY PROVIDE LOWLOSS FITTING WITH VOLUME DAMPER, BY MCGILL, AS SHOWN ON THE DRAWINGS.

2. ROUND DUCT BRANCH: PROVIDE "TWIST-IN" BELLMOUTH OR CONICAL CONNECTOR WITH VOLUME DAMPER AND 3" COLLAR FOR FLEXIBLE DUCT CONNECTION. IN THE WIDE OPEN POSITION THE VOLUME DAMPER SHALL BE OUTSIDE THE MAIN DUCT FLOW PATH. GENFLEX SM2D, CLEVAFLEX.

VI. PLENUMS:

A. CONSTRUCT PLENUMS WITH GALVANIZED STEEL FRAMING MEMBERS AND GALVANIZED SHEET STEEL, CROSS BROKEN AND RIGIDLY BRACED WITH GALVANIZED ANGLES. GAUGES AND BRACING SHALL CONFORM TO SMACNA RECOMMENDATIONS FOR DUCTWORK OF LIKE SIZES. OPENINGS FOR FANS, ACCESS DOORS, ETC., SHALL BE FRAMED WITH GALVANIZED STEEL ANGLES.

B. WHERE ACCESS DOORS ARE SHOWN, PROVIDE HINGED DOORS WITH No. 202 VENTLOK LATCH.

VII. INSULATION:

A. EXCEPT WHERE SPECIFICALLY INDICATED, INSULATION AND COMPONENT PARTS OR ACCESSORIES SHALL COMPLY WITH NFPA STANDARDS, WITH A FLAME SPREAD RATING NOT TO EXCEED 25 AND SMOKE DEVELOPED RATING NOT TO EXCEED 50 AS TESTED BY ASTM E-84, NFPA 225, OR U.L. 723 PROCEDURES.

B. INSULATION SHALL BE INSTALLED ON CLEAN, DRY SURFACES AFTER TESTING IS COMPLETE. ANY INSULATION WHICH BECOMES WET SHALL BE REPLACED WITH NEW DRY MATERIAL WHICH HAS NEVER BEEN WET. INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH THESE SPECIFICATIONS AND THE MANUFACTURER'S PRINTED INSTRUCTIONS AND RECOMMENDATIONS.

C. FLEXIBLE SUPPLY DUCTS ARE TO BE FACTORY INSULATED. EXCEPT AS OTHER-WISE INDICATED, EXHAUST DUCTS DO NOT REQUIRE INSULATION EXCEPT WHEN INDICATED ON THE PLANS. SUPPLY AND RETURN AIR DUCTS ARE TO BE EXTERNALLY INSULATED WITH R-6 INSULATION.

VIII. SUBMITTAL:

A. CONTRACTOR SHALL SUBMIT SIX (6) SETS OF SHOP DRAWINGS, EQUIPMENT AND MATERIALS BROCHURES FOR APPROVAL PRIOR TO INSTALLATION.

B. SUBMITTAL SHALL BE SECURELY BOUND, CLEARLY MARKED AND CATALOGED AND TRANSMITTED TO THE ENGINEER.

C. SUBMITTAL SHALL BE CHECKED AND STAMPED "APPROVED" BY THE CONTRACTOR PRIOR TO TRANSMITTING TO THE ENGINEER FOR HIS APPROVAL.

IX. GENERAL EQUIPMENT REQUIREMENTS:

A. ALL EQUIPMENT SHALL HAVE NAME PLATES BEARING MANUFACTURER'S NAME, ADDRESS, TRADE NAME, CATALOG OR SERIAL NUMBER AND ANY OTHER NECESSARY DATA, SECURELY AFFIXED TO THE EQUIPMENT. NAME PLATES DAMAGED OR DEFACED SHALL BE REPLACED.

B. STARTERS, CONTRACTORS, TIME CLOCKS, TRANSFORMERS, RELAYS AND OTHER DEVICES WITH OVERLOAD PROTECTION, INTERLOCKS & MANUAL RESETS RELAYS SHALL BE PROVIDED BY THE HVAC CONTRACTOR.

C. UPON COMPLETION OF THE MECHANICAL TRADES WORK, ALL SYSTEMS SHALL BE TESTED, BALANCED AND ADJUSTED. CONTRACTOR SHALL MAKE ANY CHANGES IN THE SHEAVES, BELT OR MOTOR SIZE REQUIRED FOR THE CORRECT BALANCE AS REQUIRED TO BALANCE THE HVAC SYSTEM.

X. CONTROLS:

A. PROGRAMMABLE THERMOSTATS WITH LOCKING COVERS SHALL BE PROVIDED TO CONTROL THE A/C UNITS. THERMOSTATS SHALL HAVE COOL/HEAT AND AUTO/ON/OFF FOR FAN.

XI. TESTING AND ADJUSTING:

A. DO ALL WORK REQUIRED FOR COMPLETE TESTING AND ADJUSTING OF ALL HVAC SYSTEMS. PROVIDE ALL INSTRUMENTS AND EQUIPMENT REQUIRED TO ACCOMPLISH NECESSARY TESTING, ADJUSTING, AND AS REQUIRED FOR THE SYSTEMS SPECIFIED.

XII. INSPECTIONS AND TESTING:

A. AT THE TIME OF FINAL INSPECTION, THE CONTRACTOR SHALL HAVE MADE A COMPLETE OPERATING TEST OF THE SYSTEM AND THE SYSTEM SHALL BE FULLY READY FOR OPERATION. CONTRACTOR SHALL OPERATE THE SYSTEM 8 HOURS PRIOR TO INSPECTION AND SHALL MAKE ANY & ALL NECESSARY ADJUSTMENTS IN THE SYSTEM.

B. A QUALIFIED REPRESENTATIVE IN CONTRACTOR'S EMPLOYMENT SHALL DEMONSTRATE THE SYSTEM TO THE OWNER & SHALL INFORM THE SAME AS TO THE PROPER OPERATION, MANUAL-CHANGEOVER & MAINTENANCE OF THE SYSTEM.

C. SUPPLY OF PROPER FILTERS SHALL BE FURNISHED UPON COMPLETION. FILTER DIRTIED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED WITH NEW FILTERS UPON COMPLETION OF CONSTRUCTION.

D. ALL REFRIGERANT PIPING SHALL BE TESTED FOR LEAKS AND PROVED TIGHT BEFORE FINISHED, INSULATED OR CONCEALED.

XIII. GUARANTEE:

A. HVAC CONTRACTOR SHALL GUARANTEE, IN WRITING, THAT ALL PARTS OF ALL SYSTEMS INSTALLED UNDER THIS SECTION SHALL BE LEFT IN PERFECT OPERATING CONDITION & THAT ALL DEFECTS IN ALL EQUIPMENT DEVELOPING WITHIN ONE (1) YEAR, SHALL BE REPLACED OR CORRECTED AT CONTRACTOR'S EXPENSE, EXCEPT FOR NORMAL WEAR AND TEAR. AIR CONDITIONING COMPRESSORS HAVE A FIVE (5) YEAR PRORATED WARRANTY.

STATE OF TEXAS
BASSAM G. JABORI
89863
REGISTERED PROFESSIONAL ENGINEER
6/17/14

WINDLE + VOLPE
ARCHITECTS
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GNC
CROSSROADS MALL
GREENVILLE, TEXAS

GREENVILLE PROPERTIES LTD.
GREENVILLE, TEXAS

DATE 6/17/2014
PROJECT NO. 08-14-01
DRAWN BY

MEP-1

SPECIFICATIONS - MECHANICAL, ELECTRICAL & PLUMBING