- ALL MATERIAL AND EQUIPMENT SHALL BE LISTED, LABELED OR CERTIFIED BY UNDERWRITERS LABORATORIES, INC., WHERE SUCH STANDARD HAVE BEEN ESTABLISHED. EQUIPMENT AND MATERIAL WHICH ARE NOT COVERED BY UL STANDARDS WILL BE ACCEPTED PROVIDED EQUIPMENT AND MATERIAL IS LISTED, LABELED, CERTIFIED OR OTHERWISE DETERMINED TO MEET SAFETY REQUIREMENTS OF A NATIONALLY RECOGNIZED TESTING
- CONTRACTOR SHALL VISIT SITE PRIOR TO BID TO BECOME FAMILIAR WITH EXISTING CONDITIONS. ANY CONCERNS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BID. CONTRACTOR SHALL VERIFY CONNECTIONS TO EXISITNG SYSTEMS.
- UNLESS MORE STRINGENT PROVISIONS ARE SHOWN OR SPECIFIED, THE
- WORK SHALL COMPLY WITH APPLICABLE STANDARDS OF THE FOLLOWING. A. AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)
- B. AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) C. FACTORY MUTUAL SYSTEM (FM)
- D. MANUFACTURERS STANDARDIZATION SOCIETY OF VALVE AND FITTING
- INDUSTRY (MSS) E. NATIONAL ELECTRICAL CODE (NEC) , INCLUDING AMENDMENTS BY
- LOCAL AUTHORITY HAVING JURISDICTION.
- F. SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA)
- G. UNDERWRITER'S LABORATORIES, INC. (UL) H. INTERNATIONAL MECHANICAL CODE 2012
- DURING CONSTRUCTION, PROTECT EQUIP, PIPE AND DUCTWORK. PREVENT ENTRY OF WATER, DIRT AND OBSTRUCTING MATERIALS. CLOSE OPEN ENDS WITH TEMP CLOSURES OF METAL OR POLYETHYLENE. PROTECT WORK AGAINST FREEZING. PROVIDE TEMP HEAT AS NEEDED.
- THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENTS, APPROXIMATE SIZES AND RELATIVE LOCATIONS OF PRINCIPAL EQUIPMENT AND MATERIALS TO BE PROVIDED. PROVIDE CONSTRUCTION OFFSETS AS REQUIRED FOR COORDINATED INSTALLATION. PROVIDE MINOR EQUIPMENT, DETAILS, MATERIALS, AND METHODS NOT USUALLY SHOWN BUT STANDARD, REFERENCED AND SPECIFIED, TO COMPLETE THE WORK.
- CONCEAL MECHANICAL CONSTRUCTION RUNNING THROUGH FINISHED SPACES WITHIN THE WALLS OR IN CHASES. WHERE CEILINGS OCCUR, CONCEAL THE WORK ABOVE THE CEILING UNLESS INDICATED OTHERWISE.
- IN FINISHED SPACES WITH OR WITHOUT CEILINGS, COORDINATE THE WORK WITH OTHER TRADES SO AS TO BE IN CONFORMANCE WITH THE REFLECTED CEILING PLANS. IN FINISHED SPACES WITHOUT CEILING, RUN PIPING AND DUCTWORK PARALLEL WITH LINES OF BUILDING.
- COOPERATE WITH OTHER TRADES AND FURNISH IN WRITING, INFORMATION NECESSARY TO PERMIT THE WORK OF OTHER TRADES TO BE INSTALLED AND WITH LEAST POSSIBLE INTERFERENCES OR DELAY.
- WHERE PHYSICAL INTERFERENCES CANNOT BE RESOLVED READILY, PREPARE COMPOSITE DRAWINGS AT A SCALE OF NOT LESS THAN 1/4 INCH = 1 FT, CLEARLY SHOWING THE WORK OF THIS DIVISION IN RELATION TO THE WORK OF OTHER TRADES. OBTAIN WRITTEN ACCEPTANCE BY (A/E) (O/R) OF PROPOSED CHANGES AND DISTRIBUTE DRAWINGS TO OTHER TRADES AFFECTED. CORRECT INSTALLED WORK IN CONFLICT WITH WORK OF OTHER TRADES AT NO ADDITIONAL COST.
- SUBJECT TO ACCEPTANCE BY OWNER AND WITHOUT EXTRA COST, MAKE MODIFICATIONS IN THE LAYOUT AS REQUIRED TO PREVENT CONFLICT WITH WORK OF OTHER TRADES OR FOR THE PROPER EXECUTION OF THE
- DO NOT INSTALL PIPING, DUCTS OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT IN ELECTRICAL ROOMS AND CLOSETS. DO NOT INSTALL PIPING AND DUCTS OVER, AROUND, IN FRONT OF, IN BACK OF, OR BELOW ELECTRICAL EQUIPMENT IN MECHANICAL EQUIPMENT ROOMS. DRIP PANS WILL NOT BE PERMITTED UNDER ANY CIRCUMSTANCES AROUND ELECTRICAL EQUIPMENT.
- FIRE STOPPING; SYSTEM OR DEVICES LISTED IN THE UL FIRE RESISTANCE DIRECTORY UNDER CATEGORIES XHCR AND XHEZ MAY BE USED, PROVIDING THAT IT CONFORMS TO CONSTRUCTION TYPE, PENETRATION TYPE, ANNULAR SPACE REQUIREMENTS AND FIRE RATING INCLUDED IN EACH SEPARATE INSTANCE, AND THAT THE SYSTEMS BY SYMMETRICAL FOR WALL APPLICATIONS. SYSTEMS OR DEVICES MUST BE ASBESTOS-FREE. MORTAR SYSTEMS MUST BE WARNOCK HERSEY APPROVED. 3-M IS THE DESIGN STANDARD. FIRE STOP ALL PIPE AND DUCT PENETRATIONS THRU RATED WALLS AND FLOORS.
- PROVIDE FIRE DAMPERS AS SHOWN ON PLANS AND IN ACCORDANCE WITH ALL CODES AT PENETRATIONS THROUGH FIRE RATED FLOORS, CEILINGS. PARTITIONS AND WALLS.
- WARRANTY: ALL EQUIPMENT AND MATERIAL PROVIDE MINIMUM 12 MONTHS FROM STARTUP AND COMMISSIONING AND OWNER SIGNOFF.EXTENDED WARRANTIES MAY BE REQUIRED. AND ARE INDICATED IN EQUIPMENT SECTIONS. WARRANTY SHALL COVER 100% OF PARTS, LABOR AND FREIGHT.
- EQUIPMENT MANUFACTURE LISTED ON DRAWING SCHEDULES IS THE BASIS OF DESIGN AND IS SHOWN ON PLANS. IF CONTRACTOR CHOOSES TO USE ONE OF THE OTHER MANUFACTURERS LISTED IN SPECIFICATION, CONTRACTOR IS RESPONSIBLE FOR VERIFYING FIT AND PROVIDING ALL NECESSARY MODIFICATIONS TO MEP SYSTEMS TO ACCOMMODATE PROPER INSTALLATION OF THIS EQUIPMENT AND COMPLIANCE WITH DESIGN INTENT.
- EQUIPMENT SHALL COMPLY WITH SPECIFIC EQUIPMENT SECTIONS AND ALL OTHER RELATED SECTIONS, IE: MOTORS, FANS, FILTERS, COILS, ISOLATION, ETC.
- EQUIPMENT SHALL BE INSTALLED PER THE MANUFACTURERS INSTALLATION GUIDELINES. WHEN GUIDELINES DIFFER FROM DRAWINGS SUBMIT REQUEST FOR INFORMATION FROM ENGINEER. EQUIPMENT SHALL BE INSTALLED TO ALLOW ACCESS FOR SERVICE AND MAINTENANCE. SUBMIT STARTUP REPORT FOR RECORD.
- 8 CONTRACTOR IS RESPONSIBLE FOR SECURING ALL PERMITS.
- 9 ALL DEMOLISHED EQUIPMENT, PIPING, DUCTWORK AND OTHERS SHALL SAFELY REMOVED FROM THE SITE AND DISPOSED IN A LAWFUL MANOR. CONTRACTOR IS RESPONSIBLE FOR DRAINING, REMOVING AND DISPOSING OF ALL WORKING FLUIDS AND REFRIGERANTS IN A LAWFUL MANOR.
- CHANGE ORDERS: ALL CHANGE ORDER REQUESTS WILL BE IDENTIFIED PRIOR TO THE WORK BEING INSTALLED. CHANGE ORDERS REQUESTED AFTER INSTALLATION WILL NOT BE HONORED.
- ALL REQUEST FOR INFORMATION SHALL BE SUBMITTED IN WRITING. ALLOW 10 BUSINESS DAYS FOR ENGINEER REVIEW AND RESPONSE.

SHOP DRAWING REQUIREMENTS

- SHOP DRAWINGS: CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR ALL SPECIFIED EQUIPMENT. CONTRACTOR SHALL PROVIDE COORDINATED SHOP DRAWINGS FOR PIPING AND SHEETMETAL, SHOWING COORDINATION WITH OTHER DISCIPLINES. NO EQUIPMENT, PIPING OR DUCTWORK SHALL BE INSTALLED WITHOUT AN APPROVED SHOP DRAWING. WORK OR EQUIPMENT INSTALLED WITHOUT ENGINEER'S APPROVAL WILL BE SUBJECT TO REMOVAL AND REWORK PER THE ENGINEERS SOLE DISCRETION REGARDLESS OF DESIGN DOCUMENTS. ALL COST WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL ALLOW 10 BUSINESS DAYS FOR ENGINEERS REVIEW. ALL WORK SHALL BE INSTALLED PER THE APPROVED SHOP DRAWING. FIELD MODIFICATIONS TO THE APPROVED SHOP DRAWING SHALL BE SUBMITTED FOR ENGINEER APPROVAL PRIOR TO INSTALLATION.
- CONTRACTOR SHALL BUBBLE ALL AREAS OF CONFLICT FOR ENGINEER REVIEW. CONTRACTOR SHALL SUGGEST CONFLICT RESOLUTION. ENGINEER WILL RED

- MARK SHOP DRAWINGS WITH CORRECTIVE ACTION. CONTRACTOR SHALL RESUBMI REVISED SHOP DRAWINGS. ALLOW FOR ONE (1) RE-SUBMISSION WITHOUT COST.
- SHOP DRAWING SUBMISSION: SHOP DRAWING SUBMISSIONS SHALL LIST ON COVER PAGE IN BULLETED LIST FORMAT ALL EXCEPTIONS AND CLARIFICATIONS TO THE SPECIFICATION. IF EXCEPTIONS ARE NOT LISTED IT WILL BE ASSUMED THAT SUBMITTED EQUIPMENT MEETS ALL ASPECTS OF THE SPECIFICATION. SUBMISSION OF SHEETMETAL FABRICATION DRAWINGS IS INDICATION THAT DUCTWORK AND PIPING FIT AS DRAWN, UNLESS SHOP DRAWING CLEARLY IDENTIFIES CONFLICT. CONFLICT RESOLUTION AFTER APPROVED SHOP DRAWINGS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. SUBMIT 4 COPIES.
- WHEN ENGINEERS SUBMITTAL REVIEW STAMP INDICATES THE FOLLOWING: REVIEWED, REVIEWED AS NOTED, REVISE & RESUBMIT FOR RECORD ONLY FABRICATION MAY BE UNDERTAKEN. CHANGES TO CONTRACT ARE NOT AUTHORIZED UNLESS STATED IN SEPARATE LETTER OR CHANGE ORDER.
- WHEN ENGINEERS SUBMITTAL REVIEW STAMP INDICATES THE FOLLOWING: A REVIEW OF THE SUBMITTAL WAS NOT REQUIRED OR REQUESTED. SUBMITTAL DOES NOT MEET SPECIFICATION REQUIREMENTS FOR REVIEW.
- WHEN ENGINEERS SUBMITTAL REVIEW STAMP INDICATES THE FOLLOWING: FABRICATION SHOULD NOT BE UNDERTAKEN. RESUBMIT CORRECTED COPIES FOR REVIEW. CORRECTIONS SHALL BE LIMITED TO ITEMS MARKED.
- GENERAL SHOP DRAWING INSTRUCTIONS: A. REVIEW IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN
 - CONCEPT OF THE PROJECT AND COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. B. THE CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS TO BE CONFIRMED
 - AND CORRELATED AT THE SITE; FOR FABRICATION PROCESSES OR TO THE MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES OF CONSTRUCTION AND FOR COORDINATION OF THE WORK OF ALL TRADES. C, SUBMISSION FOR REVIEW IMPLIES THAT THE CONTRACTOR HAS REVIEWED THE PRODUCT WITH ALL OTHER TRADES PRIOR TO SUBMITTING FOR REVIEW.

CONTRACTOR IS RESPONSIBLE FOR ALL CHANGES AND MODIFICATIONS FOR

- ITEMS NOT COORDINATED. D. ALL EXEMPTIONS TO THE SPECIFICATION MUST BE SHOWN IN A CLEARLY BULLETED LIST ON THE COVER SHEET OF THE SUBMITTAL. CONTRACTOR IS RESPONSIBLE FOR FULL COMPLIANCE TO THE SPECIFICATIONS FOR ALL OTHER ITEMS NOT NOTED ON THE COVER SHEET OF THE SUBMITTAL.
- CONTRACTOR UPON REQUEST WILL RECEIVE ARCHITECTURAL AUTOCAD FILES FOR THE PREPARATION OF THEIR SHOP DRAWINGS. MEP FILES WILL NOT
- CONTRACTOR SHALL SUBMIT ONE COPY OF SHOP DRAWINGS ELECTRONICALLY ENGINEER WILL PROVIDE ELECTRONIC COVER SHEET WITH STAMP WITH ALL REVIEWED COMMENTS. ALLOW TEN BUSINESS DAYS FOR ENGINEER REVIEW.

- PROVIDE SUPPORT MATERIALS IN ACCORDANCE WITH MSS SP-58. USE SUPPORT MATERIALS WHICH ARE COMPATIBLE WITH THE MATERIALS OF THE PIPING, DUCTWORK OR EQUIPMENT. PROTECT AGAINST RUST, ABRASION AND ELECTROLYTIC ACTION. SUPPORT EQUIPMENT PER OEM GUIDELINES.
- SUPPORT DUCTWORK, PIPING AND EQUIPMENT FROM BUILDING STRUCTURE. USE SUPPLEMENTAL STEEL AS NEEDED. DO NOT HANG FROM METAL DECK.

DUCTWORK SUPPORT:

- A. PROVIDE MATERIAL THAT MATCH DUCTWORK. GENERALLY USE HOT DIPPED GALVANIZED STEEL FASTENERS, STRAPS, RODS, ANGLE, ETC. B. SECURE DUCT USING 16 GA GALV STRAPS, 1-INCH WIDE FOR UP TO 60-INCH, 1-1/2-INCH FOR LARGER DUCTWORK.
- C. SECURING DUCT TO SUPPORTS BY SHEETMETAL SCREWS IS PROHIBITED

- UNLESS OTHERWISE NOTED, DESIGN MOTORS FOR NORMAL STARTING TORQUE AND CURRENT IN ACCORDANCE WITH NEMA STANDARDS USING A SERVICE FACTOR OF 1.15 AT CONSTANT SPEED.
- FOR EQUIPMENT LOCATED OUTDOORS OR EXPOSED TO WEATHER, PROVIDE MOTORS THAT ARE TOTALLY ENCLOSED FAN-COOLED (TEFC) OR TOTALLY ENCLOSED AIR OVER (TEAO) TYPE UNLESS INDICATED OTHERWISE.
- FOR MOTORS 1 HP AND LARGER, PROVIDE IN PREMIUM EFFICIENCY TYPE. FOR ALL MOTORS, PROVIDE IN CONSTANT SPEED, SQUIRREL CAGE INDUCTION TYPE.
- MOTORS AND DRIVES SHALL NOT PRODUCE SOUND LEVELS EXCEEDING OSHA STANDARDS.
- PROVIDE V-BELT MOTOR DRIVES (USE ONLY TYPE A, B, C OR D MATCHED SETS) UNLESS OTHERWISE SPECIFIED. MINIMUM DRIVE EFFICIENCY: 95 PERCENT.
- PROVIDE BELTS, PULLEYS, CHAINS, GEARS, COUPLINGS, PROJECTING SETSCREWS, KEYS AND OTHER ROTATING PARTS WITH GUARDS IN ACCORDANCE WITH OSHA.
- MOTORS USED WITH VARIABLE FREQUENCY DRIVES SHALL BE INVERTOR DUTY RATED PER NEMA MG-1-31. PROVIDE 1.15 SERVICE FACTOR, 3.1 TIMES NAME PLATE VOLTAGE, INSULATED BEARING, GROUNDED SHAFT, CAST IRON HOUSING.
- MINIMUM; PROVIDE HOA STATER OR VFD FOR ALL MOTORS, SEE SCHEDULE FOR TYPE. | 6 JOINT MATERIAL:

VARIABLE FREQUENCY DRIVE

- ACCEPTABLE MANUFACTURERS: SQUARE D, ALLEN BRADLEY, YASKAWA
- PULSE WIDTH MODULATING. BYPASS SECTION. LED DISPLAY PANEL. PROVIDE UNIT IN NEMA RATED ENCLOSURE WITH DISCONNECT. DESIGN FOR 40C AMBIENT TEMP.
- PROVIDE FOR DDC CONTROL INTERFACE; ON/OFF, SPEED CONTROL & FEEDBACK, ALARM, AMP DRAW. PROVIDE BACNET OPEN PROTOCOL. 15% SERVICE FACTOR.

MECHANICAL IDENTIFICATION

- ACCEPTABLE MANUFACTURERS: SECTION, BRADY, CRAFTMARK.
- IDENTIFY AIR CONDITIONING UNITS, AIR HANDLING UNITS, FANS, AIR TERMINAL UNITS, PUMPS, HEAT TRANSFER EQUIPMENT, WATER HEATERS, TANKS AND WATER TREATMENT DEVICES AND ALL OTHER EQUIPMENT WITH PLASTIC NAMEPLATES PERMANENTLY ATTACHED TO THE EQUIPMENT.
- IDENTIFY PIPING, COVERED OR UNCOVERED, CONCEALED OR EXPOSED, WITH PIPE MARKERS, PRESSURE SENSITIVE VINYL, COMPLY TO ANSI/OSHA STANDARDS. INDICATE PIPE FLOW DIRECTION AND MEDIA.
- IDENTIFY PIPING AND DUCT EVERY 25FT AND AT CHANGES IN DIRECTION.

ROOF CURBS AND SUPPORTS

- ACCEPTABLE MANUFACTURERS: PATE, PENN, THY CURB.
- DIMENSIONALLY COORDINATE CURBS AND SUPPORTS WITH BUILDING STRUCTURE AND EQUIPMENT TO BE SUPPORTED. PROVIDE CURB TO MATCH REQUIREMENTS OF ROOFING MATERIAL, SLOPE AND DESIGN.
- ROOF CURBS: 24 INCH HIGH, MINIMUM 18 OR 14 GAUGE GALVANIZED STEEL SIDES AS REQUIRED TO MEET LOAD, ASTM A-446, INTERNALLY REINFORCED, TREATED WOOD NAILER, FULLY MITERED CORNERS WITH

WELDED SEAMS AND 1.5 INCH THICK 3LB DENSITY INSULATION. TOP OF ALL CURBS SHALL BE LEVEL, WITH PITCH BUILT INTO CURB. PROVIDE FULLY MITERED 3 INCH CANT WITH STEP, ON BUILT-UP ROOFS.

MECHANICAL SOUND AND VIBRATION CONTROL

- ACCEPTABLE MANUFACTURERS: AMBER/BOOTH, MASON INDUSTRIES, VIBRATION ELIMINATOR COMPANY.
- PROVIDE VIBRATION ISOLATION ON ALL MOTOR DRIVEN EQUIPMENT. REFER TO DRAWINGS SCHEDULES FOR TYPE, DEFLECTION, BASE AND APPLICATION INFORMATION. MINIMUM 1/2 INCH DEFLECTION.
- ALL SPRING ISOLATORS SHALL BE COMPLETELY STABLE IN OPERATION AND SHALL BE DESIGNED FOR NO LESS TAN 30% RESERVE DEFLECTION BEYOND ACTUAL OPERATING CONDITIONS. FOR OPEN SPRING ISOLATORS THE KX/KY BE 1.0 OR GREATER.
- STEEL COMPONENTS SHALL BE CLEANED AND PAINTED. ALL NUTS, BOLTS AND WASHERS SHALL BE ZINC-ELECTROPLATED. STRUCTURAL BASES SHALL BE CLEANED, DE-SLAGED AND PRIMED WITH ZINC-CHROMATE PRIMER.
- ISOLATORS EXPOSED TO WEATHER SHALL HAVE NEOPRENE COATED SPRINGS AND HOT DIPPED GALVANIZED STEEL COMPONENTS. ISOLATORS SHALL BE DESIGNED TO WITHSTAND WIND LOADS OF 30#/SF.
- ELASTOMERIC MATERIAL SHALL BE NEOPRENE OR HIGH QUALITY SYNTHETIC RUBBER WITH ANTI-OZONE AND ANTI-OXIDANT.
- ISOLATOR TYPE SH: COMBINATION SPRING AND ELASTOMERIC HANGER CONSISTING OF RECTANGULAR STEEL BOX, COIL SPRING, SPRING RETAINERS, AND ELASTOMERIC MOUNTING DESIGNED FOR 1/2 INCH (15 MM) DEFLECTION. NUTS, BOLTS AND WASHERS SHALL BE ZINC-ELECTROPLATED. WHEN APPLICABLE INCLUDE LOAD TRANSFER PLATE TO HOLD EQUIPMENT OR PIPING AT FIXED ELEVATION DURING INSTALLATION AND TO PERMIT TRANSFERRING LOAD TO SPRING AFTER INSTALLATION.

MECHANICAL INSULATION

- ACCEPTABLE MANUFACTURERS: CERTAINTEED, JOHN MANVILLE, OWENS-CORNING.
- REFER TO DUCTWORK AND PIPE SCHEDULE ON PLANS FOR TYPE, THICKNESS AND APPLICATION OF INSULATION. UPGRADE TO BOARD TYPE INSULATION WHEN LOCATED OUTDOORS OR EXPOSED. PROVIDE PROTECTIVE JACKET ON OUTDOOR APPLICATIONS. WHEN NOT SCHEDULED PROVIDE 2 INCH ON HOT AND COLD SURFACES.
- USE MATERIALS WITH MAXIMUM FLAME SPREAD/FUEL CONTRIBUTED/SMOKE DEVELOPED RATING OF 25/50/50 IN ACCORDANCE WITH ASTM E84.
- USE INSULATION RATED FOR TEMPERATURES ENCOUNTERED.
- TYPE A: GLASS FIBER; ANSI/ASTM C547; 'K' VALUE OF 0.23 AT 75 DEGREES F; NONCOMBUSTIBLE. HIGH DENSITY, WHITE KRAFT JACKET BONDED TO ALUMINUM FOIL, REINFORCED WITH FIBER GLASS YARN. MANVILLE MICRO-LOK AP-T PLUS.
- TYPE F: FLEXIBLE FOAM ELASTOMERIC SHEET; 'K' VALUE OF 0.27 AT 75 DEGREES F WITH SMOOTH EXTERIOR SURFACE. ARMSTRONG AP ARMAFLEX OR AP SS SHEET/ROLL INSULATION.
- INSTALL INSULATION AFTER PIPING AND DUCTWORK HAS BEEN PRESSURE TESTED AND ACCEPTED. CONTINUE INSULATION WITH VAPOR BARRIER THROUGH PIPE SUPPORTS, HANGERS AND SLEEVES. INSULATE JOINTS, FITTINGS, VALVES, UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, EXPANSION JOINTS AND OTHER DEVICES WITH INSULATION OF LIKE MATERIAL AND THICKNESS AS ADJOINING PIPE AND FINISH WITH GLASS CLOTH AND ADHESIVE. INSTALL INSULATION ON VALVES, FLANGES, UNIONS, STRAINERS AND EXPANSION JOINTS IN SUCH A MANNER THAN IT CAN BE EASILY REMOVED AND REPLACED WITHOUT DAMAGE.
- SEAL JACKET JOINT, STAPLE SEAMS, PENETRATIONS BY MECHANICAL FASTENERS AND ALL OTHER VAPOR BARRIER PENETRATIONS WITH TAPE.

- DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENTS, APPROXIMATE SIZES AND RELATIVE LOCATIONS OF PRINCIPAL EQUIPMENT AND MATERIALS. PROVIDE OFFSETS AS REQUIRED FOR COORDINATED INSTALLATION. PROVIDE MINOR EQUIPMENT, DETAILS, MATERIALS AND METHODS NOT SHOWN BUT STANDARD, REFERENCED AND SPECIFIED, TO COMPLETE THE WORK. PROVIDE EXPANSION LOOPS AS SHOWN OR REQUIRED TO ALLOW FOR PIPE EXPANSION. PROTECT, FLUSH AND CLEAN ALL PIPE SYSTEMS.
- REFER TO DRAWING PIPE SCHEDULE(S) FOR PIPE SYSTEM'S MATERIAL, FITTINGS, DEVICES AND BRANCH SIZE REQUIREMENTS; ONLY MATERIALS SPECIFICALLY LISTED FOR A PARTICULAR SYSTEM MAY BE USED.
- INSTALL PIPING TO ALLOW FOR PROPER DRAINAGE AND AIR VENTING. WATER PIPING MAINS SHALL BE INSTALLED ABOVE TERMINAL DEVICES AND COILS. BRANCH PIPING SHALL BE TAPPED FROM BELOW MAINS. PROVIDE DRAINS AT SYSTEM LOW POINTS AND AUTO AIR VENTS AT SYSTEM HIGH POINTS. MIN CONDENSATE DRAIN SIZE SHALL EQUAL UNIT OUTLET.
- A. COPPER TYPE ACR: SEAMLESS COPPER TUBING, TYPE ACR, HARD DRAWN; ASTM B280
- D. PVC: PRESSURE POLY VINLY CHLORIDE, SCHEDULE 40; ASTM D2241-05

E. PVC: POLY VINLY CHLORIDE, SCH 40, PRESSURE, ASTM WK23931

- B. BRAZE FILLER METAL: ANSI/AWS A5.8. FLUX: ANSI/AWS A5.31, TYPE FB3-A OR FB3-C. D. SOLVENT WELD
- B. BRONZE: SOLDERED JOINT. D. PVC: SOLVENT WELDED JOINT.

MISCELLANEOUS:

- A. BOLTS AND NUTS: CARBON STEEL HEXHEAD STUDS WITH HEAVY HEX NUTS; ASTM A307 GRADE B, ASTM A194 GRADE 2H.
- B. GASKETS: NON-ASBESTOS MATERIAL, THICKNESS, PRESSURE AND TEMPERATURE TO SUIT SYSTEM; FLEXITALLIC. C. DIELECTRIC FITTINGS: ISOLATION FLANGES, UNIONS AND COUPLINGS, EPCO SALES, INC.
- PRESSURE TEST: PRESSURE TEST ALL PIPING SYSTEMS TO 100% OF THEIR PRESSURE RATING OR 150% OF THE DESIGN PRESSURE RATING FOR 24 HOURS. . REPAIR ALL LEAKS.

AIR FILTERS

ACCEPTABLE MANUFACTURERS: CAMBRIDGE, FLANDERS, FARR.

- A. 30 PERCENT EFFICIENT (ASHRAE 52); UL CLASS 2; 2 INCH DEEP; 0.08 INCH W.G. AT 250 FPM AND 0.28 INCH W.G. AT 500 FPM. INITIAL PRESSURE DROP. CHANGE OUT PRESSURE DROP: 0.90 INCH W.G.
- B. PLEATED, NON-WOVEN COTTON FABRIC WITH ALUMINUM SCREEN BONDED TO THE MEDIA. C. CONSTRUCT FRAME OF RIGID, HIGH WET DIAGONAL SUPPORT MEMBERS DIAGONAL SUPPORT MEMBERS BONDED TO INSIDE PERIPHERY OF

PRESSURE DROP. CHANGE OUT PRESSURE DROP: 1.5 INCH W.G.

ENCLOSURE STRENGTH FIBERBOARD WITH AIR SIDES OF EACH PLEAT. MEDIUM EFFICIENCY CARTRIDGE FILTERS: A. 45 (65,85,95) PERCENT EFFICIENT (ASHRAE 52); UL CLASS 2; 12 INCH DEEP; .25 (.30, .55, .68) INCH W.G. AT 500 FPM INITIAL

- PLEATED, HIGH DENSITY MICROFINE GLASS FIBERS, SUPPORTED BY WELDED WIRE GRID BONDED TO FILTER MEDIA. GRID SHALL SUPPORT
- MEDIA VERTICALLY AND HORIZONTALLY. C. GALVANIZED STEEL CONTOUR STABILIZERS SHALL INSURE PLEAT
- CONFIGURATION, UP TO 10 INCH W.G. D. GALVANIZED STEEL ENCLOSURE FRAME, MEDIA TO BE MECHANICALLY

AND CHEMICALLY BONDED TO FRAME TO ELIMINATE AIR BYPASS. DUCTWORK SYSTEMS

- DRAWINGS INDICATE THE GENERAL ARRANGEMENT OF THE WORK. CAREFULLY EXAMINE THE DRAWINGS AND BE RESPONSIBLE FOR PROPER FITTING OF THE WORK WITHOUT SUBSTANTIAL ALTERATION OF THE INDICATED LAYOUT. VERIFY DIMENSIONS AND ROUTING SHOWN WITH RELATION TO EXISTING WORK AND THE WORK OF OTHER TRADES OR CONTRACTS . VERIFY LOCATION AND INTERFERENCES PRIOR TO FABRICATION AND ERECTION. SIZES SHOWN ON PLANS ARE INSIDE DIMENSIONS.
- DESIGN AND TEST DUCT SYSTEMS FOR 2% LEAKAGE.
- FABRICATE AND INSTALL DUCTWORK SYSTEMS IN CONFORMANCE WITH SMACNA STANDARDS AND ANY ASSOCIATE MANUFACTURER GUIDELINES.

4 SHOP DRAWINGS:

- A. INDICATE DUCT FITTINGS, GAUGES, SIZES, WELDS AND CONFIGURATIONS. SUBMIT ASSEMBLY AND INSTALLATION INSTRUCTIONS FOR PROPRIETARY MECHANICAL DUCT CONNECTION
- B. PREPARE PLANS AND SECTION AT SCALE OF 3/8 INCH TO 1 FOOT. C. SHOW AIR OUTLETS, INLETS, LIGHT FIXTURES, STRUCTURAL ELEMENTS, LINTELS, PARTITIONS AND OTHER ELEMENTS AFFECTING ROUTING OF DUCTWORK. COORDINATE AIR DEVICE LOCATIONS WITH CEILING INSTALLER. SHOW ROOM NUMBERS, NAMES AND COLUMN LINES
- D. SHOW ACTUAL EQUIPMENT SIZES. (AHUS, TERMINAL BOXES, DIFFUSERS, FANS, ETC.)

E, COORDINATE AND SHOW WORK OF OTHER TRADES. INDICATED ANY AREAS

A. STEEL: GALVANIZED SHEET, LOCK-FORMING QUALITY, G90 FINISH, ASTM A527.

OF CONFLICT AND BRING TO A/E'S ATTENTION.

6 FABRICATION — GENERAL REQUIREMENTS

- A. SQUARE THROAT ELBOWS LARGER THAN 8 INCHES; DOUBLE THICKNESS TURNING VANES. SECURELY FASTEN VANES TO RUNNERS FOR QUIET, VIBRATION FREE OPERATION.
- B. SQUARE THROAT ELBOWS 8 INCHES AND SMALLER; RADIUS ELBOWS. MINIMUM CENTER LINE RADIUS OF 1-1/2 TIMES DUCT WIDTH.
- WHERE DUCTS ARE LOCATED OUTDOORS, LOCATE LONGITUDINAL SEAMS ON THE BOTTOM OF THE DUCT AND CROSS BREAK TOP SURFACES TO SHED WATER.
- D. DUCT TRANSITIONS: 15 DEGREE MINIMUM. E. FASTENERS SHALL GENERALLY BE STEEL, WITH ZINC OR CADMIUM COATING, BUT SHALL MATCH THE DUCTWORK MATERIAL.
- FASTENERS SHALL NOT PROJECT MORE THEN 1/2-INCH INTO DUCTWORK G. DUCT SEALANT SHALL BE UL CLASSIFIED, 25 OR LESS FLAME SPREAD, 50 OR LESS SMOKE SPREAD, 70 PERCENT MIN SOLID CONTENT, REQUIRE

7 GENERAL CONSTRUCTION

A. RECTANGULAR, SEALED JOINTS, SEAMS AND CONNECTIONS:

NO SURFACE PREPARATION. EQUAL TO UNITED MCGILL.

- (1) SEAMS: PITTSBURGH LOCK, L1. (2) JOINTS: FLANGED MECHANICAL DUCT CONNECTION SYSTEM FOR DUCTS 8 INCHES AND LARGER. T2 STANDING DRIVE SLIP FOR DUCTS SMALLER THAN 8 INCHES. T1 -SLIP AND DRIVE NOT PERMITTED ANY SIZE.
- (3) SEAL CLASS: A UNLESS OTHERWISE NOTED. B. ROUND SEALED JOINTS, SEAMS AND CONNECTIONS:
- (1) SEAMS: LOCK TYPE, RL-I OR RL-5. (2) JOINTS: RT-I, RT-6. (3) FITTINGS: SLIP TYPE; PLEATED OR CONTINUOUSLY WELDED STAMPED OR SEGMENTED. CONTINUOUSLY WELDED FITTINGS SUCH
- AS CONICAL TEES, 45 DEGREE LATERALS OR WYES MAY BE USED. (4) SEAL CLASS: A UNLESS OTHERWISE NOTED. RECTANGULAR, ROUND AND FLAT OVAL; CONTINUOUSLY WELDED JOINTS, SEAMS AND CONNECTIONS AS SPECIFIED:
- (2) RECTANGULAR JOINTS: T-21 OR T-21A. (3) ROUND JOINTS: RT-4 OR WELDED FLANGE. D. CARBON STEEL, WELDED CONSTRUCTION

(2) RECTANGULAR JOINTS: BELL TYPE OR TELESCOPIC

(3) ROUND JOINTS: RT-4 B FLANGED MECHANICAL DUCT CONNECTION SYSTEM: ACCEPTABLE

MANUFACTURERS: LOCKFORMER TDC, ENGLE TDC, WARD

(1) ROUND SEAMS: RL-4.

(1) ROUND SEAMS: RL-4.

DUCT CONNECTOR INDUSTRIES, AND DUCTMATE.

- FLEXIBLE DUCTWORK: A. ACCEPTABLE MANUFACTURER: WAGNER CORP. B. NON-METALLIC, EXPOSED TO VIEW IN FINISHED AREAS:
- FLEXIBLE TECHNOLOGIES MODEL SPIRATUBE NC-1; NEOPRENE IMPREGNATED POLYESTER FABRIC, ENCLOSED SPRING STEEL WIRE HELIX, INTEGRAL LINER. C. NON-METALLIC, CONCEALED AND UNFINISHED AREAS: THERMAFLEX INSULATED TYPE M-KC AND NON-INSULATED TYPE S-TL; UL181, CLASS 1, RATED FOR 6000 FPM VELOCITY, GLASS FIBER CLOTH,

COATED SPRING STEEL WIRE HELIX, 1 INCH THICK GLASS FIBER

INSULATION WITH VAPOR BARRIER. USE INSULATED TYPE WHERE

REQUIRED IN ACCORDANCE WITH SECTION 15250.

FLEXIBLE TECHNOLOGIES, FLEXAUST,

- 10 FLEXIBLE DUCTWORK CONNECTOR
- A. ACCEPTABLE MANUFACTURER: VENTGLASS BY VENTFABRICS B. EIGHT INCH WIDE, 30 OZ GLASS FABRIC, DOUBLE COATED WITH NEOPRENE, 25 OR LESS FLAME SPREAD, 12 GAUGE GALV STEEL SECURING BAND

LOUVER - EXHAUST / INTAKE

- A. MANUFACTURER: RUSKIN, LOUVER DAMPER
- B. SIZE INTAKE FOR BELOW WATER PENETRATION VELOCITY C. RUSKIN MODEL EME745, 7-INCH DEEP WIND-DRIVEN, RAIN RESISTANT LOUVER. .11-INCH WG PRESSURE DROP AT 700 FPM.

AIR TERMINAL UNITS (VVB, CVB, IVB)

- ACCEPTABLE MANUFACTURERS: KRUEGER, AIR DEVICES, ANEMOSTAT,
- A. CASING MATERIAL: ASTM A527, G90 GALVANIZED STEEL. B. CASING LINER: 1.5 POUND DENSITY GLASS FIBER IN CONFORMANCE
- PROVIDE FOIL REINFORCED KRAFT LINING. C. CASING LEAKAGE: MAXIMUM 1 PERCENT OF FLOW AT 2 INCH W.G., DAMPER LEAKAGE: MAXIMUM 3 PERCENT OF FLOW AT 4 INCH W.G. D. SENSOR-CONTROLLER: PRESSURE INDEPENDENT, EXTERNALLY POWERED, CONSISTING OF INLET SENSOR, VOLUME CONTROL DAMPER EXTERNAL

DIFFERENTIAL PRESSURE TAPS AND FACTORY MOUNTED CONTROLS.

TO NFPA 90A AND UL 181. PROVIDED FLANGED DUCT CONNECTION.

F. PROVIDE ACCESS DOOR TO ALLOW ACCESS TO DAMPER. G. PROVIDE DISCONNECT.

E. ATC VENDER TO PROVIDE CONTROLLER

INDEPENDENT OF DUCT SYSTEM. MOUNT UNITS ABOVE FINISHED CEILINGS. FOR UNITS MOUNTED ABOVE NON-ACCESSIBLE CEILINGS. PROVIDE ACCESS DOORS.

INSTALLATION: SUPPORT UNITS INDIVIDUALLY FROM STRUCTURE

- ACCEPTABLE MANUFACTURERS: ANEMOSTAT, AIR DEVICES, T&B, PRICE. GENERAL REQUIREMENTS: FINISH EXPOSED SURFACES WITH BAKED OFF-
- WHITE EPOXY ENAMEL (UNLESS NOTED OTHERWISE) . COORDINATE DIFFUSER MOUNTING STYLE, WITH CEILING REQUIREMENTS, REFER TO ARCHITECTURAL CEILING PLANS. ADA CERTIFIED. SIZES, LENGTHS AND NECK SIZES AS SHOWN ON PLAN LOCATE PER ARCHITECTURAL CEILING PLAN. COORDINATE LOCATIONS OF DIFFUSERS AND FRAMING OF LINEAR DIFFUSER\$ WITH CEILING GRID INSTALLER PRIOR TO INSTALLATION OF GRID. INSULATED DIFFUSER BODIES.

PROVIDE ALUMINUM CONSTRUCTION IN WETTED AREAS (LOCKERS, POOLS, ETC)

- LINEAR SLOT DIFFUSERS: ANEMOSTAT MODEL (SLAD) : STRAIGHT LINE
- SQUARE PERFORATED FACE SUPPLY CEILING DIFFUSERS: ANEMOSTAT MODEL (PR) : STEEL CONSTRUCTION, REMOVABLE CORE, HINGED DISTRIBUTION PLATE, FIELD ADJUSTABLE HORIZONTAL TO VERTICAL AIR FLOW, FIELD CHANGEABLE AIR PATTERN, ROUND NECK, WHITE PERFORATED DISTRIBUTION PLATE, BLACK BACK PAN, EQUALIZING DEFLECTOR.
- SQUARE PERFORATED FACE RETURN, EXHAUST OR TRANSFER CEILING DIFFUSERS: ANEMOSTAT MODEL (3P): STEEL CONSTRUCTION, HINGED DISTRIBUTION PLATE, ROUND NECK, WHITE PERFORATED DISTRIBUTION PLATE, BLACK BACK PAN.

BUILDING AUTOMATION SYSTEM

- BUILDING AUTOMATION SYSTEM (BAS) CONTRACTOR SHALL PROVIDE: A FULLY INTEGRATED BACNET BUILDING AUTOMATION SYSTEM (BAS) ALL PRODUCTS BTL LISTED, UL LISTED, THIN CLIENT WEB BASED UNDER INTERFACE WITH UNLIMITED NUMBER OF USERS (I.E. - NO ADDITIONAL LICENSES NEEDED). INCORPORATE DIRECT DIGITAL CONTROL (DDC) FOR ENERGY MANAGEMENT AND EQUIPMENT MONITORING AND CONTROL, INCLUDING COLOR GRAPHIC WORKSTATIONS. PROVIDE ALL HARDWARE AND SOFTWARE FOR WEB-BASED ACCESS. PROPRIETARY SYSTEMS ARE NOT ACCEPTABLE.
- BAS SHALL INTEGRATE MULTIPLE BUILDING FUNCTIONS INCLUDING EQUIPMENT SUPERVISION AND CONTROL, ALARM MANAGEMENT, ENERGY MANAGEMENT AND HISTORICAL DATA COLLECTION. BAS SHALL BE INTERNET ACCESIBLE VIA INTERNET EXPLORER.
- THE SYSTEM SHALL BE MODULAR IN NATURE AND SHALL PERMIT EXPANSION OF BOTH CAPACITY AND FUNCTIONALITY THROUGH THE ADDITION OF SENSORS, ACTUATORS, FULLY PROGRAMMABLE DDC CONTROLLERS AND OPERATOR DEVICES.
- PROVIDE ALL WIRING, CONDUIT AND PANELS FOR ALL DDC TEMPERATURE CONTROLS. BAS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ELECTRICAL WORK ASSOCIATED WITH THE BAS CONTROL SYSTEM AND AS CALLED FOR ON THE DRAWINGS. PERFORM ALL WIRING IN ACCORDANCE WITH ELECTRICAL SPECIFICATION. PROVIDE ALL 24V AND 120V WIRING FROM SPARE BREAKERS.
- SYSTEM ARCHITECTURAL DESIGN SHALL ELIMINATE DEPENDENCE UPON ANY SINGLE DEVICE FOR ALARM REPORTING AND CONTROL EXECUTION.
- MANUFACTURER SHALL BE COMPANY SPECIALIZING IN THE ENGINEERING, INSTALLATION AND SERVICE OF AUTOMATIC TEMPERATURE CONTROL SYSTEMS. ACCEPTABLE MANUFACTURERS: AUTOMATED LOGIC,
- NETWORKING COMMUNICATIONS: THE DESIGN OF THE BAS SHALL NETWORK OPERATOR WORKSTATIONS AND STAND-ALONE DDC CONTROLLERS. THE NETWORK ARCHITECTURE SHALL CONSIST OF TWO LEVELS, A HIGH PERFORMANCE PEER-TO-PEER NETWORK AND A LOCAL CONTROLLER NETWORK. WEB SERVER OR WORKSTATION AND CONTROLLERS SHALL COMMUNICATE USING BACNET PROTOCOL. WEB SERVER OR WORKSTATION AND CONTROL NETWORK BACKBONE SHALL COMMUNICATE USING ISO 8802-3 (ETHERNET) DATA LINK/PHYSICAL LAYER PROTOCOL AND BACNET/IP ADDRESSING AS SPECIFIED IN ANSI/ASHRAE 135-2007, BACNET ANNEX J. LOCAL CONTROLLER NETWORK SHALL BE BACNET MS/TP OR BACNET ARCNET AS DEFINED IN

ACCEPTABLE MANUFACTURERS: JCI, CARRIER, McQUAY (MATCH SUPPLIED EQUIP)

ANSI/ASHRAE 135-2007.

SIEMENS, JOHNSON, ADVANCED POWER

- MECHANICAL CONTRACTOR PROVIDES: A. ALL WELLS AND OPENINGS FOR WATER
- SWITCHES AND ALARMS FURNISHED BY BAS CONTRACTOR. B. INSTALLATION OF CONTROL VALVES. C. INSTALLATION OF AIR FLOW MONITORING DEVICES, OPENING FOR WATER FLOW SWITCHES AND ALARMS FURNISHED BY BAS
- CONTRACTOR.
- D. INSTALLATION OF ALL DAMPERS. ADVANCED APPLICATION CONTROLLERS (AAC) - EACH CONTROLLER SHALL OPERATE AS A STAND-ALONE, MICROPROCESSOR-BASED, MUTI-TASKING, REAL-TIME DIGITAL CONTROL PROCESSOR. PROVIDE ONE CONTROLLER PER PIECE OF EQUIPMENT, WITH INPUTS AND OUTPUTS NECESSARY TO PERFORM THE SPECIFIED SEQUENCE OF OPERATION. EACH CONTROLLER SHALL BE FULLY PROGRAMMABLE (I.E. - NOT APPLICATION SPECIFIC), PERFORM TRENDING OF ALL POINTS AT 5 MINUTE INTERVALS FOR A MINIMUM OF 2 DAYS (WITH DATA STORED WITHIN THE AAC) AND ALSO HAVE THE ABILITY TO AUTOMATICALLY PUSH DATA UP TO THE CENTRAL SERVER FOR STORAGE OF UP TO 30 YEARS OF DATA. OPERATING SCHEDULES WILL ALSO BE STORED

WITHIN EACH AAC AND GENERATE ALARMS FROM ANY POINT.

- 10 TERMINAL EQUIPMENT CONTROLLERS (TEC): A. CONTROLLERS SHALL INCLUDE ALL POINT INPUTS AND OUTPUTS NECESSARY TO PERFORM THE SPECIFIED CONTROL SEQUENCES. AS A MINIMUM, 50% OF THE POINT OUTPUTS SHALL BE OF THE UNIVERSAL TYPE. ANALOG OUTPUTS SHALL BE INDUSTRY STANDARD SIGNALS SUCH AS 24V FLOATING CONTROL, 0-10VDC, 4-20MA ALLOWING FOR INTERFACE TO A VARIETY OF MODULATING ACTUATORS. TERMINAL EQUIPMENT CONTROLLERS UTILIZING PROPRIETARY CONTROL SIGNALS
 - B. EACH CONTROLLER PERFORMING SPACE TEMPERATURE CONTROL SHALL BE PROVIDED WITH A MATCHING ROOM TEMPERATURE SENSOR. THE SENSOR MAY BE EITHER RTD OR THERMISTOR. C. EACH ROOM SENSOR SHALL INCLUDE THE FOLLOWING AUXILIARY

AND ACTUATORS SHALL NOT BE ACCEPTABLE.

- DEVICES: SETPOINT ADJUSTMENT DIAL, TEMPERATURE INDICATOR, OVERRIDE SWITCH. D. EACH CONTROLLER SHALL PERFORM ITS PRIMARY CONTROL FUNCTION INDEPENDENT OF OTHER DDC CONTROLLER LAN COMMUNICATION, OR IF
- E. PROVIDE CO2 SENSOR FOR DEMAND VENTILATION CONTROL WHEN SHOWN ON PLANS OR SCHEDULED. F. CONTROL WILL MEET OR EXCEED ASHRAE 135-2007 BACNET STANDARD
- FOR ADVANCED APPLICATION CONTROLLER. 1 ROOM TEMPERATURE SENSORS : A. ROOM SPACE SENSORS SHALL UTILIZE EITHER RTD OR THERMISTOR

G. APPROVED MANUFACTURER: AUTOMATED LOGIC, HONEYWELL,

SENSING ELEMENTS, AND HAVE AN INTEGRAL OVERRIDE PUSHBUTTON. USE STAINLESS STEEL COVER IN CLEAN ROOM AREAS.

LAN COMMUNICATION IS INTERRUPTED.

B. TEMPERATURE MONITORING RANGE: +20/120°F C. OUTPUT SIGNAL: VARIABLE RESISTANCE

SEIBE. OR SIEMENS.

- D. ACCURACY: +/- .36°F E. EACH ROOM SENSOR SHALL HAVE AN INTEGRAL PUSHBUTTON FOR OVERRIDING UNOCCUPIED PERIODS. THE PUSHBUTTON CAN BE SET VIA THE BAS FRONT END OF PROVIDE UP TO 8 HOURS (ADJ) OF OVERRIDE.
- F. SENSORS SHALL HAVE A SETPOINT ADJUSTMENT SLIDER. TO PROVIDE A CONFIGURABLE (FROM BAS FRONT END) NUMBER OF DEGREES OF ADJUSTMENT TO THE VAV BOX ROOM TEMPERATURE SETPOINT.

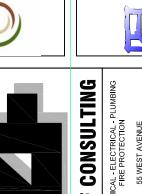
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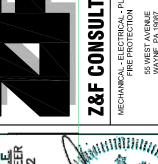
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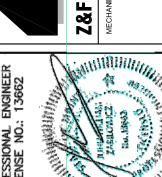
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MECHANICAL SPECIFICATIONS



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KEY PLAN: GROUND FLOOR

△ BLDG. DEPT. REVIEW

AS NOTED

SHEET TITLE: