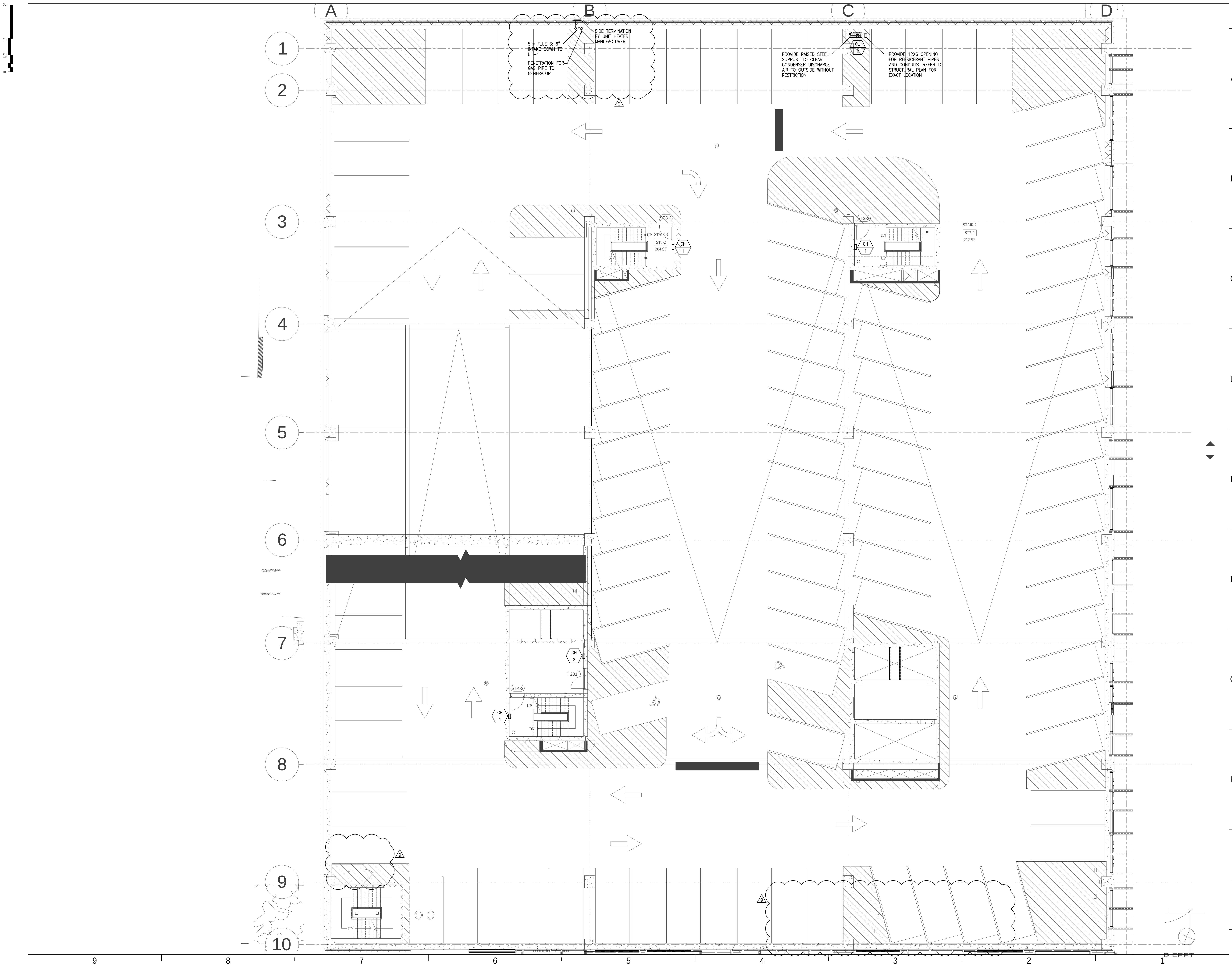


1.	GENERAL REQUIREMENTS: A. THE GENERAL REQUIREMENTS OF THE ARCHITECTURAL SPECIFICATIONS ARE A PART OF THESE SPECIFICATIONS. WHERE AN INCONSISTENCY EXISTING BETWEEN THE WORKING OR INTENT, THIS SHALL TAKE PRECEDENCE. B. THE STANDARD FORM OF GENERAL CONDITIONS ISSUED BY AMERICAN INSTITUTE OF ARCHITECTS DOCUMENT A201, LATEST EDITION, SHALL FORM PART OF THIS CONTRACT. C. ALL CONTRACTORS FOR THIS WORK SHALL VERIFY EQUIPMENT LOCATIONS, WEIGHTS, AND CLEARANCES IN THE FIELD PRIOR TO SUBMITTING BIDS TO VERIFY CONDITIONS, INTERFERENCES WITH OTHER TRADES, AND DIMENSIONS. NO ALLOWANCES WILL BE MADE AFTER ACCEPTANCE OF BIDS FOR FAILURE TO COMPLY. D. ALL BUILDING STANDARDS, WRITTEN OR OTHERWISE, ARE TO BE CONSIDERED PART OF THIS CONTRACT. WHERE A DISCREPANCY EXISTING BETWEEN THESE DOCUMENTS AND BUILDING STANDARD, THE CONTRACTOR SHALL CONTACT THE ENGINEER IN WRITING IMMEDIATELY. 2. SCOPE OF WORK: A. PROVIDE ALL LABOR AND MATERIAL, EQUIPMENT, FACILITIES, TRANSPORTATION, AND SERVICES NECESSARY TO FURNISH, INSTALL AND COMPLETE THE HEATING, VENTILATING AND AIR CONDITIONING WORK AS INDICATED ON THE DRAWINGS, AND SPECIFIED HEREIN. THE WORKMANSHIP SHALL BE COMPLETE IN EVERY RESPECT BE TESTED AND APPROVED, AND BE SATISFACTORY TO THE ARCHITECT/ENGINEER AND IN ACCORDANCE WITH LOCAL, COUNTY, AND STATE LAWS GOVERNING THIS INSTALLATION, INCLUDING THE FIRE MARSHAL. B. THE DRAWINGS INDICATED DIAGRAMMATICALLY THE EXTENT AND LOCATION OF THE WORK INCLUDED. WORK INDICATED BUT HAVING MINOR DETAILS OBVIOUSLY OMITTED, SHALL BE PROVIDED. INCLUDING THESE DETAILS, WITHOUT EXTRA CHARGE. C. INTENT: IT IS THE DECLARED AND ACKNOWLEDGED INTENT OF THESE SPECIFICATIONS TO PROVIDE THE HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS, INCLUSIVE OF ALL REQUIRED PARTS, AND ACCESSORIES COMPLETE AND READY FOR USE AS ITEMIZED BUT NOT NECESSARILY LIMITED TO THE FOLLOWING: 1. RETROFIT DUCT PIPING 2. HVAC DRAIN PIPING 3. PIPING CLEANING AND TESTING 4. ALL HEATING AIR CONDITIONING, RETURN AND EXHAUST DUCTWORK 5. DUCT LINING AND THERMAL INSULATION 6. DUCT SEALING, CLEANING AND TESTING 7. EQUIPMENT, PIPING, DUCTWORK, AND VALVE IDENTIFICATION 8. TESTING AND BALANCING 9. TEMPERATURE CONTROL SYSTEMS 10. MOTOR STATISTERS, MAGNETIC CONTACTORS, AND CONTROLS FOR HVAC EQUIPMENT. 3. A. THE CONTRACTOR SHALL PRIOR TO SUBMITTING HIS BID FOR DOING WORK AS DESCRIBED IN THIS SPECIFICATIONS AND ON ACCOMPANYING DRAWINGS. VISIT THE SITE AND COMPLETELY FAMILIARIZE HIMSELF (HERSELF) WITH THE DIFFICULTIES AND FACILITIES THAT WILL BE INVOLVED FOR THE PROPER EXECUTION OF THE CONTRACT. NO EXTRA COMPENSATION SHALL BE ALLOWED FOR THE CONTRACTOR FAILING TO DO SO OR NOT TO FULLY APPRECIATE DIFFICULTIES AT HAND. 4. FEES AND INSPECTIONS: A. ALL CONTRACTOR SHALL APPLY, PROCURE AND PAY FEES FOR ALL PERMITS AND INSPECTIONS OR OTHER OBLIGATIONS THAT THE CITY, COUNTY, STATE, OR UTILITIES MAY REQUIRE IN ORDER FOR HIM/HER TO DO THEIR WORK ACCORDING TO PLANS AND SPECIFICATIONS. 5. LAWS AND ORDINANCES: A. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES AND REGULATIONS BEARING ON THE CONDUCT OF WORK AS DRAWN AND SPECIFIED. IF THE CONTRACTOR OBSERVES THAT THE DRAWINGS AND SPECIFICATIONS ARE IN VIOLATION OF ANY LAWS, ORDINANCES, RULES AND REGULATIONS, HE/SHE SHALL PROMPTLY NOTIFY THE ENGINEER IN WRITING WHEN SUBMITTING HIS BID AND ANY NECESSARY CHANGES SHALL BE ADJUSTED AS PROVIDED IN THE CONTRACT FOR SUCH CHANGES IN WORK. IF THE CONTRACTOR PERFORMS ANY WORK CONTRARY TO SUCH LAWS, ORDINANCES, RULES AND REGULATIONS, HE/SHE SHALL BEAR ALL COSTS FOR CORRECTING THIS WORK. 6. THIRD PARTY CERTIFICATIONS: ALL PACKAGED EQUIPMENT SHALL BE INDEPENDENTLY THIRD PARTY LABELED AS A SYSTEM FOR USE BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) IN ACCORDANCE WITH OSHA FEDERAL REGULATIONS, NFPA PAMPHLET #70, AND NATIONAL ELECTRIC CODE (NEC) ARTICLE 90-7. 7. TRADE JURISDICTION: A. WHEN IT BECOMES NECESSARY FOR THE COMPLETE FULFILLMENT OF THIS WORK FOR THIS CONTRACTOR TO FURNISH LABOR OR MATERIAL OTHER THAN THAT WHICH IS GENERALLY ACCEPTED BY HIS TRADE OR BRANCH OF WORK, THE CONTRACTOR SHALL SUBMIT SAME TO CONTRACTOR ENGAGED IN THE TRADE OR BRANCH OF WORK INVOLVED TO THE END THAT THERE SHALL BE NO DELAY TO OR STOPPAGE OF WORK DUE TO THE INFRINGEMENT OR ALLEGED INFRINGEMENT TO TRADE AGREEMENTS AS TO THE JURISDICTIONS. 8. SUBMITTALS: A. THIS CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, COMPLETE LISTS INCLUDING CATALOG CUTS, ETC., AND WHERE APPLICABLE DIMENSIONED SHOP DRAWINGS OF ALL MATERIALS, FIXTURES AND EQUIPMENT TO BE FURNISHED AND INSTALLED UNDER THIS CONTRACTOR. INCLUDE SHEET METAL DUCT LAYOUTS, AND PIPING PLAN LAYOUTS. SUBMIT SIX (6) COPIES OF SHOP DRAWINGS; TWO (2) PRINTS, AND ONE (1) REPRODUCIBLE OF EACH SHOP DRAWING PLAN. SUBMIT SHOP DRAWINGS FOR REVIEW. DO NOT ORDER EQUIPMENT, FABRICATE DUCTWORK OR INSTALL EQUIPMENT BEFORE RECEIVING SHOP DRAWINGS. REVIEWED BY THE ENGINEER. REQUIRED ITEMS TO BE SUBMITTED SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: 1.) GRILLES 2.) REGISTERS 3.) DIFFUSERS 4.) TEMPERATURE CONTROL 5.) ACCESS PANELS 6.) LOUVERS 7.) EQUIPMENT 8.) PUMP 9.) SUPPLEMENTAL AIR CONDITIONING UNIT 9. RECORD DRAWINGS SUBMITTAL: A. AT PROJECT CLOSEOUT THE CONTRACTOR SHALL SUBMIT RECORD DRAWINGS, "AS-BUILT DRAWINGS" OR INSTALLED DUCTWORK, PIPING AND EQUIPMENT AS IT WAS ACTUALLY INSTALLED SO AS TO MAKE A PERMANENT RECORD. SUBMIT DRAWINGS AT 1" = 1'-0" SCALE SUBMIT ON (1) REPRODUCIBLE AND TWO (2) PRINTS OF EVERY DRAWINGS TO ENGINEER SUBMIT ON (1) REPRODUCIBLE AND ONE (1) PRINT OF EVERY DRAWING TO OWNER. 10. WORKMANSHIP AND MATERIALS: A. ALL MATERIALS SHALL BE NEW AND OF FIRST QUALITY. ALL LABOR SHALL BE EXECUTED IN A NEAT, WORKMANLIKE MANNER AND SHALL BE PERFORMED BY MECHANICS SKILLED IN THEIR RESPECTIVE TRADES. THE ENGINEER SHALL DECIDE ALL MATTERS PERTAINING TO THE QUALITY OF WORKMANSHIP AND MATERIALS. 11. SPECIFICATIONS AND DRAWINGS: A. SPECIFICATIONS AND DRAWINGS ARE INTENDED TO BE COOPERATIVE. WHAT IS CALLED FOR BY EITHER SHALL BE AS BINDING AS IF CALLED FOR BY BOTH. ANY WORK OR MATERIALS NOT SPECIFICALLY MENTIONED THOUGH REQUIRED TO MAKE THE JOB COMPLETE SHALL BE FURNISHED BY THE CONTRACTOR AS HIS/HER EXPENSE. 12. OPERATING INSTRUCTIONS: A. THIS CONTRACTOR SHALL PREPARE A LIST IN DUPLICATE OF INSTRUCTION OF THE OPERATION OF ALL EQUIPMENT AND SHALL INSTRUCT IN ITS OPERATION. ALL VALVES SHALL BE MARKED WITH A METAL TAG AND A SCHEDULE OF THE EQUIPMENT SCHEDULE. 13. THIS CONTRACTOR SHALL PREPARE AND FURNISH TO THE OWNER, TWO (2) BOUND BOOKLETS EACH CONTAINING A COMPLETE LIST OF ALL EQUIPMENT INSTALLED UNDER THIS CONTRACT, EACH PIECE OF EQUIPMENT LISTED SHALL ALSO BE DESCRIBED BY MANUFACTURER'S FIGURE NUMBER. THE COMPONENTS THEREIN WHICH MAKE UP THE PART LIST. 14. GUARANTEE: A. THIS CONTRACTOR SHALL GUARANTEE HIS WORK TO BE FREE FROM DEFECTIVE WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF FINAL CERTIFICATE. ANY REPAIRS OR REPLACEMENT DURING THE PERIOD SHALL BE MADE WITHOUT COST TO THE OWNER, UPON HIS OR HER REQUEST. 15. COORDINATION OF WORK: A. THE CONTRACTOR SHALL CONFER WITH OTHER TRADES WHOSE WORK MAY AFFECT HIS INSTALLATION TO AVOID INTERFERENCE BEFORE STARTING THE INSTALLATION. ALL CHANGES IN THE WORK OF THIS CONTRACTOR CAUSED BY HIS NEGLECT TO COMPARE AND CONFER WITH OTHER TRADES SHALL BE MADE BY HIM AT HIS OWN EXPENSE. 16. CUTTING AND PATCHING: A. EACH CONTRACTOR SHALL DO HIS OWN CUTTING AND PATCHING. IF STRUCTURALLY REQUIRED, HE SHALL PROVIDE AND INSTALL THE NECESSARY STEEL WHEN GOING THROUGH A BEARING WALL. THIS CONTRACTOR SHALL NOT ENDANGER ANY WORK BY CUTTING, DIGGING OR OTHERWISE AND SHALL NOT CUT OR ALTER THE WORK OF OTHER TRADES WITHOUT CONSENT OF THE ENGINEER OR ARCHITECT. 17. ALL CUTTING, DRILLING AND PATCHING OF BUILDING CONCRETE, MASONRY, STEEL OR IRON WORK SHALL BE INCLUDED BY CONTRACTOR, SO THAT THE WORK SHALL BE PROPERLY INSTALLED. UNDER NO CONDITIONS MAY STRUCTURAL WORK BE CUT, WITHOUT WRITTEN APPROVAL FROM THE ENGINEER PRIOR TO START OF WORK. 18. ALL CORING OR HOLES DRILLED INTO THE STRUCTURAL FLOOR, OF ANY SIZE SHALL BE PRE-APPROVED AND INSPECTED BY THE BUILDING ENGINEER. STORE THE CORE SPOLS FOR INSPECTION PRIOR TO DISPOSAL. NOTIFY THE ENGINEER IF THERE IS ANY DAMAGE TO RACEWAYS THAT ARE BURIED IN THE SLAB. THE CONTRACTOR SHALL REMOVE ANY DEVICE OR RACEWAYS THAT ARE PLACED INTO THE HOLES PRIOR TO INSPECTION. 19. SLEEVES: A. GENERAL: LAY OUT THE WORK IN ACCORDANCE WITH REVIEWED SHOP DRAWINGS. FURNISH AND SET IN PLACE IN ADVANCE OF POURING OF SLABS OR CONSTRUCTION WALL. PROVIDE REINFORCING RODS NECESSARY TO COMPLETE WORK. SET SLEEVES IN POSITION IN FORMWORK. PROVIDE REINFORCING AROUND SLEEVES. B. FLOOR AND ROOF SLEEVES: STANDARD WEIGHT GALVANIZED STEEL PIPE WITH BOTTOM END FLUSH WITH SURFACE. TOP END EXTENDED 1" ABOVE FINISHED FLOOR (8" ABOVE ROOF) ANNULAR SPACE CAULKED WITH GLASS FIBER AND SEALED AT TOP AND BOTTOM WITH BUTL MASTIC, ACRYLIC OR CAULKED WITH MOLDED RUBBER LINK SEALS. 20. FOUNDATION WALL: CAST IRON FABRICATED SLEEVES, FLUSH INSIDE AND OUTSIDE WITH FLASHING FLANGE AT MEMBRANE WATERPROOFING IF REQUIRED. CAULKED WITH MOLDED RUBBER LINK SEALS WITH STAINLESS STEEL BOLTS AND NUTS. 21. MASONRY AND CONCRETE WALLS: STANDARD WEIGHT GALVANIZED STEEL PIPE, FLUSH WITH WALL SURFACE AT BOTH ENDS. ANNULAR SPACE CAULKED WITH GLASS FIBER AND SEALED AT BOTH FACES WITH BUTL MASTIC, ACRYLIC OR CAULKED WITH MOLDED RUBBER LINK SEALS. 22. INTERIOR PARTITION AND CEILINGS: 18 GAUGE GALVANIZED STEEL WITH LOCK JOINTS, ANNULAR SPACE CAULKED WITH GLASS FIBER AND SEALED AT BOTH FACES WITH BUTL MASTIC, ACRYLIC OR CAULKED WITH MOLDED RUBBER LINK SEALS. 23. SLEEVES FOR PIPES AND OPENING FOR DUCTS THROUGH FIRE RATED AND FIRE RESISTIVE FLOORS AND WALLS, AND FIRE PROOFING: UL LISTED, PENETRATIONS SHALL BE SEALED TO THE ORIGINAL HOURLY FIRE RATING WITH FIRE STOP SYSTEM CAPABLE OF PREVENTING THE PASSAGE OF FLAMES AND HOT GASES WHEN SUBJECTED TO THE REQUIREMENTS OF THE TEST STANDARDS SPECIFIED FOR FIRE STOPS (ASTM E119 and E814 [UL 1479]). FIRE SEAL AT PENETRATION THROUGH RATED WALLS, CEILING AND FLOORS WITH 3M MODEL # FIRE BARRIER GP-25 OR THOMAS AND BETTS MODEL # FLAME SAFE. 24. FIRESTOPPING INSULATION: GLASS FIBER TYPE, NON-COMBUSTIBLE. 25. SEALANT: ACRYLIC	2.	SIZE: SLEEVES FOR UN-INSULATED PIPING SHALL BE APPROXIMATELY 3" LARGER THAN OUTSIDE DIAMETER OF PIPE PASSING THROUGH SLEEVES FOR INSULATED PIPING SHALL BE LARGE ENOUGH TO ACCOMMODATE THE FULL THICKNESS OF THE PIPE INSULATION COVERING WITH CLEARANCE FOR EXPANSION AND CONTRACTION. 3. H. DUCT SLEEVES: WHERE DUCTS PASS THROUGH WALLS SEPARATING MECHANICAL ROOM AND OCCUPIED AREA, PROVIDE 18 GAUGE GALVANIZED STEEL SLEEVES AND PACK TIGHT BETWEEN DUCT AND OPENING WITH FIBER GLASS FOR FIBER GLASS BARRIER. THE EXPOSED SIDE OF DUCTWORK SHALL HAVE GALVANIZED 1/2" ANGLE IRON CLOSURE AROUND DUCT. THE ANGLE IRONS SHALL BE SECURED TO THE WALL CONSTRUCTION. 4. VERIFICATION OF DIMENSION: A. BEFORE PROCEEDING WITH ANY WORK, THE CONTRACTOR SHALL CAREFULLY CHECK AND VERIFY ALL DIMENSIONS, SIZES, ETC., AND SHALL ASSUME FULL RESPONSIBILITY FOR THE FITTING-IN OF HIS EQUIPMENT AND MATERIALS TO OTHER PARTS OF THE EQUIPMENT AND MATERIALS TO OTHER PARTS OF THE EQUIPMENT AND TO THE NEW AND/OR EXISTING STRUCTURES. B. WHERE APPARATUS AND EQUIPMENT HAS BEEN INDICATED ON THE DRAWINGS. DIMENSIONS HAVE BEEN TAKEN FROM SPECIFIC EQUIPMENT OF THE CLASS INDICATED. THE CONTRACTOR SHALL CAREFULLY CHECK THE DRAWINGS TO SEE THAT THE EQUIPMENT HE CONTEMPLATES INSTALLING WILL FIT INTO THE SPACE PROVIDED. 5. DEMOLITION: A. PIPING, VALVES, DUCTWORK, EQUIPMENT, ETC., WHICH IS REQUIRED TO BE REMOVED TO PERFORM WORK UNDER THE SPECIFICATION WILL BE PERFORMED BY THIS CONTRACTOR AND TURNED OVER AND DELIVERED TO BUILDING MAINTENANCE DEPARTMENT OR DISPOSED OF AS DIRECTED. B. ANY HOLES OR CAVITIES LEFT IN WALLS, ROOFS, CEILING, ETC., AFTER REQUIRED DEMOLITION REMOVAL OF PIPING, DUCTWORK EQUIPMENT, ETC., SHALL BE FILLED IN AND PATCHED BY THIS CONTRACTOR IN A MANNER APPROVED BY ENGINEER AND OWNER. FAILURE ON THIS CONTRACTOR'S PART TO COMPLY WITH ABOVE SHALL MAKE HIM RESPONSIBLE FOR ANY EXTRA EXPENSE INVOLVED. C. ANY EQUIPMENT OR ARCHITECTURAL ELEMENTS DAMAGED OR DESTROYED IN THE DEMOLITION WORK SHALL BE REPAIRED, REPLACED, AND/OR BROUGHT BACK TO GOOD WORKING ORDER TO THE SATISFACTION OF OWNER AND ENGINEER. 6. CLEANING UP: A. UPON COMPLETION OF WORK AND TESTING, REMOVE ALL LABELS, TAGS, ETC., FROM ANY SPECIALTIES EQUIPMENT, ETC., AND REMOVE ALL GREASE OR COATINGS FROM ANY EQUIPMENT, ETC., AND LEAVE WORK IN A MANNER ACCEPTABLE TO THE OWNER AND ENGINEER. 7. RUBBISH: A. THIS CONTRACTOR SHALL NOT ALLOW WASTE MATERIAL OR RUBBISH CAUSED BY HIS EMPLOYEES TO ACCUMULATE IN OR ABOUT THE PREMISES. BUT SHALL REMOVE SAME AT THE COMPLETION OF THE WORK HE SHALL REMOVE ALL RUBBISH, TOOLS, SCAFFOLDING, AND SURPLUS MATERIALS FROM ABOUT THE BUILDING AND SHALL LEAVE HIS WORK THOROUGHLY CLEANED AND READY FOR USE. IN CASE OF A DISPUTE AS TO RESPONSIBILITY, THE OWNER WILL REMOVE THE RUBBISH AND CHARGE THE COST OF SUCH WORK TO THE CONTRACTOR. 8. PROTECTION: A. PROTECT ALL MATERIALS OR EQUIPMENT INSTALLED UNDER THIS CONTRACT FROM ALL DAMAGE DUE TO BUILDING OPERATION, WEATHER, ETC. CONTRACTOR WILL BE HELD STRICTLY RESPONSIBLE FOR ANY DAMAGE INCURRED TO MATERIALS, EQUIPMENT, ETC., DUE TO HIS FAILURE TO TAKE NECESSARY PRECAUTIONS OR PROVIDING PROPER PROTECTION. TAKE ALL NECESSARY PRECAUTIONS TO PROTECT THE WORK OF OTHERS. IN THE EVENT OF DAMAGE TO OTHER WORK CAUSED BY THIS CONTRACTOR, HIS EMPLOYEES OR HIS APPARATUS, HE SHALL HAVE SAME REPAIRED AT HIS OWN EXPENSE. PROVIDE TEMPORARY FILTERS ON EXISTING RETURN AIR DUCTS TO PROTECT THEM FROM GATHERING CONSTRUCTION DUST. 9. ACCESS DOORS: A. ACCESS DOOR SHALL BE INSTALLED FOR ALL NON-ACCESSIBLE EQUIPMENT, VALVES, OPERATION, CONTROLS, OR OTHER ACCESS DOORS REQUIRING REMOVAL OR ADJUSTMENT. MECHANICAL CONTRACTOR SHALL FURNISH AND INSTALL ACCESS DOORS AND ADVISE GENERAL CONTRACTOR OF THE LOCATION OF ALL ACCESS DOORS REQUIRED THROUGH THE CONSTRUCTION. GENERAL CONTRACTOR WILL INSTALL ALL SUCH DOORS. ACCESS DOORS SHALL BE AS REVIEWED BY ENGINEER AND ARCHITECT AND WITH FINISH TO MATCH ADJACENT SURFACE FINISH. 10. DEFECTIVE WORK AND/OR MATERIALS: A. IF ANY PARTS OF THE WORK OR MATERIALS ARE DEFECTIVE, OR NOT IN STRICT CONFORMANCE WITH THE DRAWINGS, OR DIFFERENT FROM THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, OR DEFACED OR INJURED THROUGH NEGLIGENCE OF THIS CONTRACTOR OR HIS EMPLOYEES, OR THROUGH THE ACTION OF FIRE OR WEATHER, OR ANY OTHER CAUSE, WILL BE REJECTED, AND SHALL BE IMMEDIATELY REMOVED FROM THE PREMISES BY THIS CONTRACTOR AND SATISFACTORY MATERIAL AND WORK SUBSTITUTED THEREOF WITHOUT DELAY. B. ANY DEFECTIVE WORK OR MATERIALS, WHICH MAY BE DISCOVERED SHALL BE CORRECTED IMMEDIATELY UPON NOTICE FROM THE ENGINEER. C. NO PREVIOUS INSPECTION OR CERTIFICATIONS ON ACCOUNT SHALL BE HELD TO RELIEVE THIS CONTRACTOR FROM THE OBLIGATION TO FURNISH SOUND MATERIALS AND TO PERFORM GOOD AND SATISFACTORY WORK. 11. BUILDING STANDARDS: A. IF BUILDING HAS STANDARDS FOR PIPING, DUCTWORK, DIFFUSERS, GRILLES, REGISTERS, VAV BOXES, FAN POWERED BOXES, TEMPERATURE CONTROLS, OTHER EQUIPMENT, ETC., PROVIDE SAME UNLESS NOTED OTHERWISE. 12. DUCTWORK: A. ALL DUCTWORK SHALL BE PRIMED GALVANIZED STEEL STEEL, LOCK FORMING QUALITY, FABRICATED IN ACCORDANCE WITH CURRENT EDITION OF THE ASHRAE GUIDE AND/OR GOVERNING AUTHORITIES SHALL BE IN ACCORDANCE WITH THE MAXIMUM STANDARDS AND TRADE PRACTICES AS SET FORTH BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) INCLUDING THEIR DUCT MANUALS, CURRENT EDITION. B. SHEET METAL DUCTWORK – TRANSVERSE JOINT CONNECTORS FOR RECTANGULAR, ROUND AND OVAL DUCTWORK. PREFABRICATED SLIDE ON CONNECTOR SYSTEM CONSISTING OF FLANGES, CORNER PIECES, GASKETS, AND CLEATS SHALL BE ACCEPTABLE. C. THE NEED FOR ADDITIONAL DUCT SEALING MAY BE REQUIRED. D. THE LEAK FREE SYSTEM IS GOOD FOR DUCT POSITIVE PRESSURE UP TO 10 INCHES W.G. AND GOOD FOR DUCT NEGATIVE PRESSURES UP TO 3 INCHES W.G. E. SHEET METAL DUCTWORK LONGITUDINAL SEAMS. 1.) PITTSBURGH LOCK SHALL BE USED ON ALL LONGITUDINAL SEAMS 2.) SWAP LOCK SEAMS ARE NOT ACCEPTABLE 3.) IF SMACNA SEAL CLASS A OR B IS SPECIFIED, THE LONGITUDINAL SEAMS SHALL BE SEALED FROM THE INSIDE. D. ROUND SPIRAL DUCTWORK SHALL BE UNITED MCGILL TYPE DUCT FITTING OR APPROVED EQUAL INSTALLED AND SUSPENDED AS PER MANUFACTURER'S RECOMMENDATIONS. WHERE DUCTWORK IS EXPOSED TO VIEW AND IS TO BE PAINTED, DUCTWORK OF PAINTABLE GALVANIZED STEEL. E. ALL DUCTS ARE TO BE GALVANIZED. F. SHEET METAL (POCKET LOCKS, STANDING SEAMS, STANDING S-SLIPS, ETC.) G. VENTILATION CONSTRUCTION NOT COVERED BY THE ASHRAE GUIDE AND/OR GOVERNING AUTHORITIES SHALL BE IN ACCORDANCE WITH THE MAXIMUM STANDARDS AND TRADE PRACTICES AS SET FORTH BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) INCLUDING THEIR DUCT MANUALS, CURRENT EDITION. H. DUCT DIMENSIONS SHOWN ON DRAWINGS OR INSIDE DIMENSIONS, INCREASE DUCT SIZE WHEN LINING IS USED. I. COOLING COIL DRAIN PANS TO BE STAINLESS STEEL AND PIPED WITH RUNNING TRAP TO FLOOR DRAIN. CONDENSATE DRAIN PIPING FROM AHU, FC OR ETC., SHALL BE 1/2" NPT PIPE SIZE UNLESS NOTED OTHERWISE. J. THE CONTRACTOR SHALL GUARANTEE THAT THE PLENUM USED FOR RE-CIRCULATION OF AIR WILL BE OF TIGHT CONSTRUCTION AND FROM TRAPS, SOIL STACKS, DOWNSPOUS, VENTS, EXHAUST DISCHARGE AN OTHER SOURCES WILL BE ENCLOSED SO THAT NO CONTAMINATED AIR WILL BE RE-CIRCULATED. K. ALL EQUIPMENT SHALL HAVE TEFC MOTORS AND BE RATED TO OPERATE IN "PLENUM" CEILINGS. L. DUCT CONSTRUCTION PRESSURE CLASSIFICATIONS: 1.) CLASS I DUCTS (LOW PRESSURE) 3/4" 1" OR 2" S.P. a.) DUCT PRESSURES UP TO 3/4" W.G. POSITIVE OR NEGATIVE PRESSURES – 3/4" W.G. CONSTRUCTION. b.) DUCTWORK PRESSURES OVER 3/4" AND UP TO 1" W.G. POSITIVE OR NEGATIVE PRESSURES – 1" W.G. CONSTRUCTION. c.) DUCT PRESSURE OVER 1" W.G. AND UP TO 2" W.G. POSITIVE OR NEGATIVE PRESSURE – 2" W.G. CONSTRUCTION. 2.) CLASS II DUCTS (MEDIUM PRESSURE) 3" OR 4" S.P. a.) DUCT PRESSURES OVER 2" W.G. UP TO 3" W.G. POSITIVE OR NEGATIVE PRESSURES. b.) DUCT PRESSURES OVER 3" W.G. UP TO 4" W.G. POSITIVE OR NEGATIVE PRESSURES. 3.) DUCTWORK SHALL BE DESIGNED AND INSTALLED AS PER SMACNA PRESSURE CLASSIFICATION UNLESS NOTED OTHERWISE. 4.) WHERE NO DUCT PRESSURE CLASSIFICATIONS ARE SHOWN IN THE CONTRACT DOCUMENTS, INCLUDING SPECIFICATIONS, PLANS, AND SCHEDULES, 2" W.G. SHALL BE THE DESIGN BASIS OF DUCT PRESSURE FOR DUCT CONSTRUCTION. 5.) WHEN NO DUCT PRESSURE CLASSIFICATIONS ARE SHOWN IN THE CONTRACT DOCUMENTS, INCLUDING SPECIFICATIONS, PLANS, AND SCHEDULES, FOR SUPPLY VARIABLE AIR VOLUME SYSTEMS, 3" W.G. SHALL BE THE DESIGN BASIS OF DUCT PRESSURE FOR DUCT CONSTRUCTION UPSTREAM OF THE VAV BOXES. ALL DUCTWORK DOWNSTREAM OF THE VAV BOXES SHALL BOXES. ALL DUCTWORK DOWNSTREAM OF THE VAV BOXES SHALL BE CONSTRUCTION USING 2" W.G. DUCT CLASSIFICATION REQUIREMENTS UNLESS NOTED OTHERWISE. 6.) DUCT SEALING: a.) CLASS I DUCTS: SMACNA SEAL CLASS B, SEAL ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS OF ALL SUPPLY, RETURN AND EXHAUST DUCTS. b.) CLASS II DUCTS: SMACNA SEAL CLASS A, SEAL ALL TRANSVERSE JOINTS AND LONGITUDINAL SEAMS OF ALL SUPPLY, RETURN AND ALL DUCT WALL PENETRATIONS. c.) SEAMS AND CONNECTIONS IN DUCTWORK SHALL BE SECURELY FASTENED AND SEALED WITH WELDS, GASKETS, MASTICS (ADHESIVES) AND MASTIC PLUS EMBEDDED FABRIC SYSTEMS. d.) MASTICS AND MASTIC/TAPE DUCT SEALANTS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 181A OR UL 181B. DUCT CONNECTIONS OF AIR DUCTS THROUGH FLOORS SHALL BE MADE IN ACCORDANCE WITH UL 181A OR UL 181B. DUCT CONNECTION TO FLANGES OF AIR DISTRIBUTION SYSTEM EQUIPMENT SHALL BE SEALED AND MECHANICALLY FASTENED. e.) FOR CLASS I DUCTWORK, AEROSOL BASED SEALING MAY BE USED BY PRESSURIZING THE INSIDE OF THE DUCT WITH A FOG OF SEALANT PARTICLES. f.) DUCT TAPE IS NOT PERMITTED AS A SEALANT ON ANY METAL DUCT. L. MAXIMUM DUCTWORK LEAKAGE FOR ALL SYSTEMS WILL BE 2% OF TOTAL AIR QUANTITY. ALL EXISTING DUCTWORK IN SCOPE OF WORK AREA THAT HAS LEAKS IN RIGID DUCTWORK OR FLEXIBLE DUCTWORK SHALL BE SEALED, REPLACED, OR REATTACHED TO MAKE DUCTWORK LEAK PROOF AT NO ADDITIONAL COSTS. ALL DUCTWORK SHALL BE SUBJECTED TO PRESSURE TEST PRIOR TO CLEANING, PAINTING, INSULATION OR COATMENT WITHIN THE BUILDING. LEAK TESTS SHALL BE CONDUCTED IN COMPLIANCE WITH SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL (LATEST EDITION). ALL DUCTWORK SHALL BE LEAK TESTED. A ROUGH CLEANING OF THE DUCTWORK SHALL REMOVE DEBRIS AND TRASH FROM DUCTWORK, DAMPERS, COIL FACE AREAS, TURNING VANES, ETC. PRIOR TO FINAL CLEANING OF DUCTWORK, DUCT PRESSURE TEST AND LEAK TESTING MUST BE COMPLETE. CLEAN DUCT SYSTEM AND FORCE AIR AT HIGH VELOCITY THROUGHOUT TO REMOVE ACCUMULATED DUST. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH TEMPORARY FILTERS, OR BYPASS DURING CLEANING. CLEAN DUCT SYSTEMS WITH HIGH POWER VACUUM MACHINES. M. SUPPLY, RETURN AND EXHAUST DIFFUSERS, REGISTERS, AND GRILLES SHALL BE PROVIDED AS SCHEDULED ON THE DRAWINGS. ALL AIR OUTLETS AND INLETS SHALL BE COMPATIBLE WITH BUILDING TENDANT STANDARDS AND THE ARCHITECTURAL CEILING AND WALL SYSTEMS PROVIDED. ALL AIR OUTLETS AND INLETS SHALL BE FINISHED AS SELECTED BY ARCHITECT. FOR EXACT LOCATIONS OF ALL AIR OUTLETS AND INLETS, SEE ARCHITECTURAL DRAWINGS. A 5'-0" MAX. LENGTH OF INSULATED FLEXIBLE DUCT WILL BE PROVIDED TO EACH AIR SUPPLY OUTLET AND RETURN INLET AS REQUIRED. IF DUCTWORK IS SOUND-LINED, EXTEND RECTANGULAR SOUND-LINED DUCTWORK TO A POINT NEAR THE OUTLET OR INLET SO THAT THE FLEXIBLE DUCT CAN BE ATTACHED TO THE OUTLET OR INLET.	3.	O. TAPERED SPIN-IN FITTING, WITH LOCK-IN QUADRANT AND VOLUME DAMPER, WILL BE PROVIDED FROM BRANCHES TO DIFFUSERS FOR LOW PRESSURE DUCTWORK. P. ALL BRANCH DUCT TAKE-OFFS WILL BE EQUIPPED WITH TAPERED FITTINGS. Q. FIRE DAMPERS WILL BE PROVIDED PER NFPA OR LOCAL CODE, WHICH EVER IS GREATER. PROVIDE TYPE "B" FIRE DAMPERS FOR LOW PRESSURE DUCTWORK AND "C" FIRE DAMPER FOR HIGH AND MEDIUM PRESSURE DUCTWORK. PROVIDE A DUCT ACCESS DOOR FOR EACH FIRE DAMPER. R. VOLUME DAMPERS WILL BE PROVIDED FOR AIR BALANCE PURPOSES. PROVIDE MANUAL VOLUME DAMPERS ON ALL LOW PRESSURE SUPPLY, RETURN, AND EXHAUST DUCTWORK BRANCHES AND TO AIR DIFFUSERS, AND REGISTERS UNLESS NOTED OTHERWISE. DAMPERS SHALL BE OPPOSED BLADE TYPE UNLESS NOTED OTHERWISE. 1.) VOLUME DAMPERS ABOVE ACCESSIBLE CEILINGS: PROVIDE WITH LOOKING TYPE WITH LEVEL HANDLE, POSITION INDICATOR AND LOCK NUT. YOUNG REGULATOR SERIES 400 OR VENTLOK SERIES 600. 2.) VOLUME DAMPERS ABOVE ACCESSIBLE CEILINGS: PROVIDE WITH LOOKING TYPE WITH LEVEL HANDLE, POSITION INDICATOR AND LOCK NUT. YOUNG REGULATOR SERIES 400 OR VENTLOK SERIES 600. S. PROVIDE AIR TURNING DEVICES AT ALL LOW PRESSURE SUPPLY AIR BRANCH TAKE-OFFS FROM MAINS. AT DIFFUSER TAKE-OFF WHERE DIFFUSER IS LOCATED BELOW MAIN AND WHERE INDICATED DEVICES SHALL BE COMPLETE WITH WORK GEAR MECHANISM FOR OPERATION OR ADJUSTMENTS THRU THE FACE OF THE DIFFUSER. IF TURNING DEVICE IS LOCATED REMOTELY FROM GRILL OR DIFFUSER, PROVIDE EXTENSION ROD ON ADJUSTING DEVICE. T. PROVIDE FACTORY-FABRICATED TURNING VANES IN ALL SQUARE ELBOWS. U. A CEILING PLENUM RETURN AIR SYSTEM WILL BE UTILIZED AS PER DRAWINGS. V. ALL DUCTWORK SYSTEMS WILL BE TESTED FOR PRESSURE AND LEAKAGE, SUBMIT TEST DATA SHEET TO ENGINEER. 27. INSULATION AND ACOUSTICAL LINING: FURNISH AND INSTALL INSULATION OR LINING. ANY MATERIAL WITHIN PLENUMS MUST MEET NC MECHANICAL CODE AND NC FUEL GAS CODE. B. DUCT SOUND LINING: 1.) LOW PRESSURE SUPPLY, EXHAUST/RETURN, RELIEF AIR, EXHAUST DUCTWORK (15 FEET UPSTREAM AND DOWNSTREAM OF FIRST DISCHARGE) 1/2" FIBERGLASS TYPE, 1 1/2 LBS PER CU. FT. DENSITY (R=5.4 OR PER ENERGY CODE) AND LEED APPROVED FLEED PROJECTS. 2.) MEDIUM PRESSURE SUPPLY AIR DUCTS: 1/2" SEMI-RIGID GLASS FIBER TYPE, 3 LBS PER CU. FT. DENSITY (R=6.5 OR PER ENERGY CODE). 3.) ALL DUCT SIZES NOTED ON DRAWINGS ARE AIRWAY SIZES WITHOUT SOUND LINING INCLUDED, ADJUST SHEET STEEL SIZES, ACCORDINGLY. 4.) DUCT LINER SHALL MEET THE REQUIREMENT OF NFPA BULLETIN 90-A AND SHALL BE LABELED BY UL. 5.) ALL DUCTWORK THAT IS SUPPOSED TO BE SOUND-LINED BUT IS NOT SOUND-LINED REGARDLESS OF REASON, SHALL BE INSULATED. C. DUCT INSULATION: 1.) ALL SUPPLY DUCTWORK NOT SOUND-LINED, ALL EXHAUST/RETURN AIR DUCTWORK LOCATED IN NON AIR CONDITIONED SPACES SUCH AS CEILINGS AND/OR PLENUMS CEILINGS: 1/2" FLEXIBLE GLASS FIBER WITH ALL SERVICE VAPOR BARRIER JACKET, 1.0 LBS PER CU. FT. DENSITY (R=5.6 OR PER ENERGY CODE, WHICHEVER IS MORE STRINGENT). 2.) ALL SUPPLY AIR, EXHAUST/RETURN AND EXHAUST DUCTWORK NOT SOUND-LINED LOCATED IN NON AIR CONDITIONED SPACES SUCH AS MECHANICAL ROOMS AND ATTIC: 1/2" SEMI-RIGID GLASS FIBER WITH ALL SERVICE VAPOR BARRIER JACKET, 3.0 LBS. PER CU. FT. DENSITY (R=6.5 OR PER ENERGY CODE). 3.) ALL SUPPLY AIR, RETURN AIR, MIXED AIR, LOCATED OUTDOOR, AND ALL OUTSIDE AIR PLENUMS: 2" SEMI-RIGID GLASS FIBER, 3 LBS. PER CU. FT. DENSITY WITH ALL SERVICE VAPOR BARRIER JACKET (R=8.7 OR PER ENERGY CODE). D. INSULATED FLEXIBLE DUCT: 1.) ALL SUPPLY AND RETURN AIR DUCTWORK CONNECTIONS TO EACH AIR SUPPLY OUTLET AND RETURN INLET: 5'-0" LENGTH MAXIMUM LENGTH. PROVIDE WITH VAPOR BARRIER JACKET OVER INSULATION. 2.) REFRIGERATION PIPING: a.) REFRIGERATION SUCTION PIPING: CELLULAR GLASS WITH NO JACKET. 1-1/2 THICK FOR PIPES SIZES 1/2" AND SMALLER. 2" THICK FOR PIPES SIZES 2" AND LARGER. b.) REFRIGERATION HOT GAS PIPING: GLASS FIBER WITH ALL SERVICE JACKET 1/2" THICK FOR PIPES SIZES 1/2" AND SMALLER. 1" THICK FOR PIPES SIZES 1" AND LARGER. c.) CHILLED WATER: FIBERGLASS WITH ALL SERVICE JACKET, PIPE INSULATION SHALL BE APPLIED WITH ALL ADJOINING SECTIONS FIRMLY BUTTED TOGETHER AND THE LONGITUDINAL SEAM OF THE VAPOR BARRIER LAP CEMENTED WITH FOSTER NO. 85-75. END JOINTS SHALL BE SEALED WITH MINIMUM 3" WIDE FACTORY FURNISHED VAPOR BARRIER STRIPS APPLIED WITH FOSTER NO. 85-75 LAP CEMENT. ALL FITTINGS, VALVES, STRAINERS, ETC., SHALL BE FABRICATED WITH INSULATION AND ZESTON INSULATED FITTINGS. 3.) LOW TEMPERATURE CONDENSER WATER: FIBERGLASS WITH ALL SERVICE JACKET, PIPE INSULATION SHALL BE APPLIED WITH ALL ADJOINING SECTIONS FIRMLY BUTTED TOGETHER AND THE LONGITUDINAL SEAM OF THE VAPOR BARRIER LAP CEMENTED WITH FOSTER NO. 85-75. END JOINTS SHALL BE SEALED WITH MINIMUM 3" WIDE FACTORY FURNISHED VAPOR BARRIER STRIPS APPLIED WITH FOSTER NO. 85-75 LAP CEMENT. ALL FITTINGS, VALVES, STRAINERS, ETC., SHALL BE INSULATED AND PROVIDED WITH ZESTON INSULATED FITTINGS. 5.) AIR CONDITIONING CONDENSATE: FOAMED ELASTOMERIC PIPE INSULATION; EQUAL TO ARMSTRONG AP ARMAFLEX, SELF-SEAL ARMAFLEX 2000, OR RUBATEX R-180-FS/R-1800-FS. 28. MECHANICAL IDENTIFICATION: A. GENERAL: PROVIDE MECHANICAL IDENTIFICATION FOR MECHANICAL EQUIPMENT, PIPING, AND DUCT SYSTEMS, COMPLY WITH ANSI A13.1 FOR LETTERING SIZE, LENGTH OF COLOR FIELD, COLORS AND VIEWING ANGLES OF IDENTIFICATION DEVICES. B. EQUIPMENT: PROVIDE EQUIPMENT SYSTEM NUMBER, CAPACITY, FLOW RATE, STATIC PRESSURE PUMP HEAD, HORSEPOWER, VOLTAGE. PROVIDE "SETON MODEL VENTMARK" MARKER. C. PIPING SYSTEMS: PROVIDE SYSTEM DESIGNATION NAME AND DIRECTION OF FLOW. PROVIDE "SETON MODEL SETMARK" PIPE MARKERS. D. DUCT SYSTEMS: PROVIDE SYSTEM DESIGNATION NAME AND DIRECTION OF FLOW. PROVIDE "SETON MODEL VENTMARK" MARKERS. E. VALVE TAGS: PROVIDE BRASS VALVE TAGS AND BRASS "T" HOOD FASTENERS WITH VALVE NUMBER AND TYPE OF SERVICE NOTED ON TAG. PROVIDE DURABLE VALVE TAGS. THE CHART SHALL BE FOR AIR VALVES AND SHALL INDICATE VALVE IDENTIFICATION NUMBER, LOCATION, AND PURPOSE. PROVIDE "SETON BRASS VALVE TAGS AND VALVE CHARTS". 29. VENTILATION, HYDRONIC PIPING TEST AND BALANCE: A. GENERAL: CONTRACTOR SHALL NEGOTIATE A CONTRACT WITH INDEPENDENT QUALIFIED AND CERTIFIED MEMBER OF NEBB OR ASBC TO COMPLETELY BALANCE AIR SYSTEM AND HYDRONIC PIPING, AS REQUIRED. CONTRACTOR SHALL SUBMIT A PROJECT CERTIFICATION GUARANTEE AND CERTIFIED BALANCE REPORT TO ARCHITECT/ENGINEER BEFORE PROJECT FINAL ACCEPTANCE. 1.) ADJUST SUPPLY AIR OUTLET QUANTITIES TO PLUS OR MINUS 5% OF INDICATED SUPPLY AIR QUANTITIES. 2.) ADJUST RETURN AND EXHAUST AIR INLETS TO PLUS OR MINUS 10% OF INDICATED RETURN AIR AND EXHAUST AIR QUANTITIES. 3.) ADJUST HYDRONIC FLOW QUANTITIES TO PLUS OR MINUS 10% OF INDICATED DESIGN FLOW QUANTITIES. B. THE BALANCING CONTRACTOR SHALL REPORT ANY DEFICIENCIES TO ARCHITECT/ENGINEER AND MECHANICAL CONTRACTOR. THE BALANCING CONTRACTOR SHALL ALSO RECOMMEND POSSIBLE ACTION TO REMEDY THE DEFICIENCIES. IN GENERAL, THE MECHANICAL CONTRACTOR SHALL CHANGE FAN SHEAVES, DRIVES, PUMP IMPELLERS, ETC., TO REMEDY DEFICIENCIES AT NOT COST TO OWNER. 30. PIPING: A. GENERAL: ALL PIPING FOR THIS WORK SHALL BE IN CONFORMANCE WITH ASTM STANDARDS. ALL CHANGES IN DIRECTION SHALL BE IDENTIFIED ON FITTINGS. ALL PIPING AND CLEANING SHALL BE DONE BEFORE ASSEMBLY. PROVIDE VALVE OF SIMILAR MATERIAL AS THE PIPING MATERIAL THEY ARE INSTALLED IN. FERROUS BODY VALVE WITH STEEL PIPING, BRASS AND BRONZE VALVES WITH COPPER PIPING. PROVIDE DIELECTRIC FITTINGS, UNION, ETC., WHERE PIPING, VALVES, FITTINGS, EQUIPMENT, ETC., OF DISSIMILAR METALS ARE JOINED. COVER OPEN PIPING DURING CONSTRUCTION. FLUSH OUT AND CLEAN PIPING IN A MANNER APPROVED BY THE ENGINEER FOR EACH BRANCH TAKEOFF. PROVIDE A 3-ELBOW "T" SHAPE CONNECTION TO PROVIDE PIPING FLEXIBILITY FOR PIPE EXPANSION. PROVIDE GUIDES, ANCHORS, EXPANSION LOOPS, SUPPORTS, VENTS, DRAINS, MAKE-UP WATER, CONTROLS, ETC. AS REQUIRED. B. COPPER PIPING SHALL HAVE SOCKET FITTING FOR SOLDER OR BRAZING CONNECTION. C. STEEL PIPING SHALL BE SCHEDULE 40, ASTM A120 OR A53, UNLESS OTHERWISE NOTED. THE FITTINGS IN 2" AND LARGER SHALL BE CAST IRON OR MALLEABLE ITEM SCREWED FITTINGS. UNLESS NOTED OTHERWISE, ALL PIPING 2" AND LARGER SHALL BE BUTT WELDED. WELDING SHALL BE DONE BY ONLY WELDERS CERTIFIED FOR THIS WORK. PAINT ALL EXPOSED THREADS AFTER ASSEMBLY. FOR ALL PIPING EXPOSED TO THE OUTSIDE AIR, PAINT PIPING WITH ONE COAT OF RUST-INHIBITTING PRIMER AND ONE COAT OF BLACK FINISH PAINT. D. PIPING SYSTEMS AND MATERIALS: 1.) REFRIGERANT PIPING: TYPE K DRAWN COPPER OR TYPE ACR DRAWN COPPER WITH BRAZED CONNECTION. PROVIDE TYPE K DRAWN COPPER FOR THE CITY OF CHICAGO PROJECTS. PROVIDE SHUTOFF VALVES, FILTER DRIERS, SOLENOID VALVES, THERMAL EXPANSION VALVES, SIGHT GLASSES, PRESSURE GAUGES, OIL TRAPS, ETC. AS REQUIRED. PROVIDE INSULATED REFRIGERANT VENT PIPING TO THE OUTSIDE, AS REQUIRED. 2.) CONDENSER WATER, CHILLED WATER, AND HEATING HOT WATER PIPING: 2" AND SMALLER, SCHEDULE 40 BLACK STEEL, ASTM A-53 GRADE B, WELDED WITH MILL-ATTACHED EXTRA HEAVY TAPERED RECESSED COUPLINGS. 2 1/2" AND LARGER SHALL BE ASTM A53 GRADE B, WITH BEVELED ENDS FOR WELDING. AT CONTRACTORS OPTION, 2 1/2" AND SMALLER, HARBOR, SEAMLESS COPPER TUBING, CONFORMING TO ASTM SPECIFICATION B-88, BROUGHT SWEAT TUBE MANUFACTURED OF SEAMLESS TUBING; FORGED BRONZE OR BRASS, SHALL MEET THE STANDARDS OF ANSI/ASME B16.22. IN ALL CASES WHERE COPPER PIPE CONNECTIONS ARE MADE TO PIPING OR ITEMS OF A DISSIMILAR METAL, PROVIDE DIELECTRIC FITTINGS AS SPECIFIED. 3.) NATURAL GAS PIPING: 2" AND SMALLER; SCHEDULE 40 BLACK STEEL, ASTM A-53 GRADE B, WELDED WITH MILL-ATTACHED EXTRA HEAVY TAPERED RECESSED COUPLINGS. 2 1/2" AND LARGER SHALL BE ASTM A53 GRADE B, WITH BEVELED ENDS FOR WELDING. 4.) HVAC CONDENSATE DRAIN PIPING: TYPE L DRAWN COPPER FOR INDOOR DRAINS FROM COPPER PIPING SYSTEM. INSTALL A TRAP IN THE DRAIN PIPING. IF ALLOWED BY CODE, CPVC MAY BE USED. SEE DETAIL FOR SIZE OF DRAIN PIPE. 31. NOISE AND VIBRATION CONTROL: A. IT IS RECOMMENDED THAT FINAL SOUND REQUIREMENTS ARE AS FOLLOWS: 1.) LOBBY, TOILETS, CORRIDORS: NC-40 2.) SPACE ADJACENT TO FAN ROOMS: NC-45 3.) OFFICES, CONFERENCE ROOMS, ETC.: NC-35 B. ACOUSTICAL SHA VIBRATION TREATMENT SHALL BE PROVIDED, AS REQUIRED TO MAINTAIN SPACE NOISE CRITERIA SPECIFIED, INCLUDING VAV BOXES, FAN POWERED BOXES, FAN POWERED MIXING UNITS, AIR DISTRIBUTION DEVICES, FAN EQUIPMENT, ETC. C. ACOUSTICAL TREATMENT SHALL PROVIDED FOR ALL EQUIPMENT AS REQUIRED TO MEET CODE OR THE SYSTEM DESIGN. VIBRATION ISOLATORS AND FLEXIBLE CONNECTIONS SHALL BE PROVIDED, AS REQUIRED FOR FANS, REFRIGERATION COMPRESSORS, EMERGENCY GENERATORS, CONDENSERS, PUMPS, AIR-HANDBARS, UNITS, AIR-COOLED CHILLS, AIR-COOLED COMPRESSORS, COOLING TOWERS, ETC. PROVIDE AND INSTALL SPRING AND/OR NEOPRENE VIBRATION ISOLATORS TO ATTAIN 97% EFFICIENCY FOR EQUIPMENT LOCATED ON THE LONGEST STRUCTURAL SPAN OF THE BUILDING.	32.	PRESSURE TESTING A. GENERAL: 1.) DURING CONSTRUCTION ALL PIPING, TUBING, AND DUCTWORK INTERIORS SHALL BE KEPT CLEAN OF DEBRIS, BEFORE TESTING IS STARTED. 2.) EACH SYSTEM OF PIPING AND DUCTWORK SHALL BE TESTED BY THE CONTRACTOR. 3.) CLEANING OF TEMPERATURE CONTROL TUBING AND DUCTWORK SHALL BE DONE BEFORE TESTING. 4.) CLEANING OF PIPING SYSTEMS THAT ARE HYDRAULICALLY PRESSURE TESTED SHALL BE DONE AFTER TESTING. B. AFTER PORTIONS OF THE MECHANICAL WORK ARE COMPLETED, THE FOLLOWING TESTS SHALL BE MADE IN THE PRESENCE OF THE ENGINEER'S AND OWNER REPRESENTATIVE FIVE (5) DAYS' ADVANCE WRITTEN NOTICE OF THE TESTS SHALL BE GIVEN TO THE ENGINEER WHO IN TURN WILL NOTIFY OTHER PARTIES INTERESTED. FURNISH ALL PUMPS, GAGES, BLOWERS, INSTRUMENTS, TEST EQUIPMENT AND PERSONNEL REQUIRED FOR TESTS, AND MAKE ALL PROVISIONS FOR REMOVAL OF TEST EQUIPMENT AND DRAINING OF PIPES AFTER TESTS HAVE BEEN MADE. C. SUBJECT ALL PIPING AND CONNECTION TO HYDROSTATIC OR PNEUMATIC PRESSURE TEST PRIOR TO PAINTING, INSTALLATION OF INSULATION OR CONCEALMENT WITHIN THE BUILDING. D. CHILLED WATER/CONDENSER WATER/HEATING HOT WATER PUMP: SUBJECT TO PNEUMATIC TEST PRESSURE OF NOT LESS THAN 1.5 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 210 PSI. TEST SHALL DEMONSTRATE FITNESS OF PIPING INSTALLATION TO HOLD REQUIRED PRESSURE FOR A PERIOD OF NOT LESS THAN FOUR (4) HOURS. 33. CLEANING A. GENERAL 1.) PRIOR TO ACCEPTANCE OF THE INSTALLATION AND FINAL PAYMENT OF THE CONTRACT, THE CONTRACTOR SHALL PERFORM THE WORK OUTLINED HEREIN. 2.) EACH SYSTEM OF PIPING AND DUCTWORK SHALL BE CLEANED AS HEREINAFTER SPECIFIED, PRIOR TO BEING PLACED IN SERVICE AND AFTER OPERATING TESTS ARE PERFORMED. B. CLEANING 1.) AT THE CONCLUSION OF THE CONSTRUCTION, THE SITE AND STRUCTURE SHALL BE CLEANED THOROUGHLY OF ALL DEBRIS AND UNUSED MATERIALS REMAINING FROM THE MECHANICAL CONSTRUCTION. ALL TUNNELS AND CLOSED OFF SPACES SHALL BE CLEANED OF ALL PACKING BOXES, WOOD FRAME MEMBERS, AND OTHER WASTE MATERIALS USED IN THE MECHANICAL CONSTRUCTION. 2.) THE ENTIRE SYSTEM OF PIPING AND EQUIPMENT SHALL BE CLEANED INTERNALLY. EACH CONTRACTOR SHALL OPEN ALL DIRT POUCHES AND STRAINERS, COMPLETELY BLOWING DOWN AS REQUIRED, AND CLEAN STRAINER SCREENS OF ALL ACCUMULATED DEBRIS. 3.) ALL PUMPS SHALL BE DRAINED AND PROVEN FREE OF SLUDGE AND ACCUMULATED WATER. 4.) ALL TEMPORARY LABELS AND STICKERS SHALL BE REMOVED FROM ALL FIXTURES AND EQUIPMENT. 5.) HEATING AND AIR CONDITIONING EQUIPMENT, PUMPS, TRAPS, ETC., SHALL BE THOROUGHLY CLEANED, AND NEW FILTERS OR FILTER MEDIA INSTALLED. 6.) ALL SURFACES OF ALL COILS, FANS, AIR UNITS AND AIR FILTERS SHALL BE WIPED CLEAN OR WASHED IF REQUIRED. ALL PLUMBING FIXTURES SHALL BE CLEANED THOROUGHLY OF ALL FOREIGN MATTER INCLUDING STICKERS, CLEANING ITEMS FURNISHED, SUCH AS FLOOR DRAINS, PUMPS, MOTORS, CONDENSERS, AND TRAPS, LEAVING THE ENTIRE INSTALLATION IN FIRST-CLASS CONDITION. 7.) ALL CONSTRUCTION PERIOD AIR FILTERS IN AIR HANDLING SYSTEMS SHALL BE REPLACED WITH THE PERMANENT AIR FILTER MODULES AFTER THE INDIVIDUAL AIR HANDLING SYSTEMS HAVE BEEN OPERATED CONTINUOUSLY FOR AT LEAST 24 HOURS. THIS PURGING OPERATION SHALL BE COMPLETED AFTER THE AIR SYSTEMS HAVE BEEN SUCCESSFULLY TESTED AND BALANCED. 8.) AFTER ALL TESTING AND CLEANING OF PIPING AND DUCTWORK SYSTEMS, THESE SYSTEMS CAN BE I NSULATED. 9.) REFRIGERANT PIPING: FLOW CLEAR TO FREE MOISTURE AND FOREIGN MATTER WITH CYLINDER WATER-PUMP COMPRESSED AIR OR NITROGEN. PURGE SYSTEM BEFORE PLACING IN SERVICE. 10.) WATER AND GAS PIPING: FLUSH THOROUGHLY UNTIL PIPING IS CLEANED TO THE SATISFACTION OF THE ENGINEER. 11.) DUCTWORK: REMOVE DEBRIS AND TRASH FROM DUCTWORK, DAMPERS, COIL FACE AREAS, TURNING VANES, ETC., AND VACUUM-CLEAN DUCTS IN VICINITY OF OPENING BEFORE GRILLES, REGISTERS, AND DIFFUSERS ARE INSTALLED. 34. TEMPERATURE CONTROL A. TEMPERATURE CONTROL SHALL BE BY EQUIPMENT MANUFACTURER B. MANUFACTURER: COORDINATE WITH EQUIPMENT MANUFACTURER AND BUILDING ENGINEER. C. PROVIDE ALL INTERFACE CONNECTIONS AND CONTROL DEVICES REQUIRED BETWEEN FACTORY SUPPLIED CONTROLS OF EQUIPMENT AND THE TEMPERATURE CONTROL CONTRACTOR'S CONTROLS AS REQUIRED IN THE CONTRACT DOCUMENTS SO AS TO FURNISH THE OWNER WITH A COMPLETE AND WORKING TEMPERATURE CONTROL SYSTEM. D. OTHER TEMPERATURE CONTROLS: NEW SUPPLEMENTAL A/C UNIT AND CORRESPONDING EQUIPMENT SHALL BE STAND ALONE SYSTEM. F. PROVIDE SHOP DRAWING SUBMITTALS.																																																																																																																																																																																																				
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SCOPE OF DOCUMENT

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2. ON THE BASIS OF THE SCOPE INDICATED OR DESCRIBED, THE CONTRACTOR SHALL FURNISH AND INCLUDE IN HIS PROPOSALS ALL ITEMS NECESSARY TO PROVIDE THE PROPER EXECUTION AND COMPLETION OF THE WORK.

STAMP

9	PHASE 1 HFC ADDENDUM	2/20/2019
8	ISSUE FOR REVISIONS	12/6/2018
7	PHASE 1 CONSTRUCTION	11/2/2018
6	PHASE 1 (PODIUM) PERMIT REV.	10/12/2018
5	PHASE 1 (PODIUM) PERMIT REV.	9/21/2018
4	PHASE 1 (PODIUM) PERMIT REV.	9/7/2018
3	PHASE 1 (PODIUM) PERMIT	7/17/2018
2	FOUNDATION PERMIT REV	5/3/2018
1	FOUNDATION PERMIT	4/20/2018
NUMBER	ISSUED FOR	DATE

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TBD

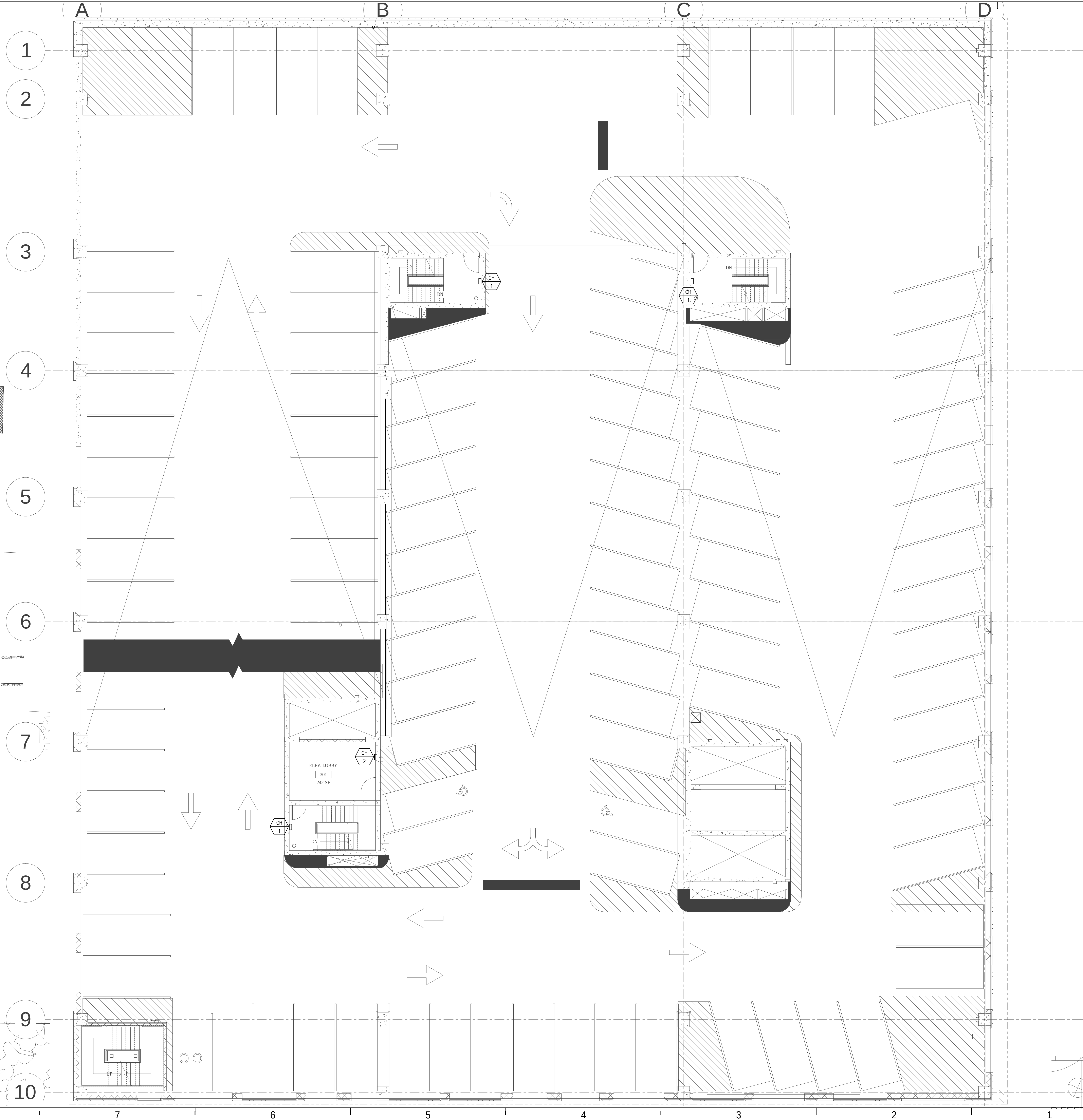
ACOUSTICAL CONSULTANT
TBD

PROJECT
FAYETTEVILLE MIXED-USE DEVELOPMENT
500 Hay Street, Fayetteville, NC 28301

SHEET TITLE

**MECHANICAL
2ND FLOOR PLAN**

PROJECT NO.	M102
DATE	



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MECHANICAL / ELECTRICAL / PLUMBING ENGINEER
ADVANCE CONSULTING GROUP INTERNATIONAL
300 W. Adams Street, Suite 420, Chicago, IL 60606

POOL CONSULTANT
TBD

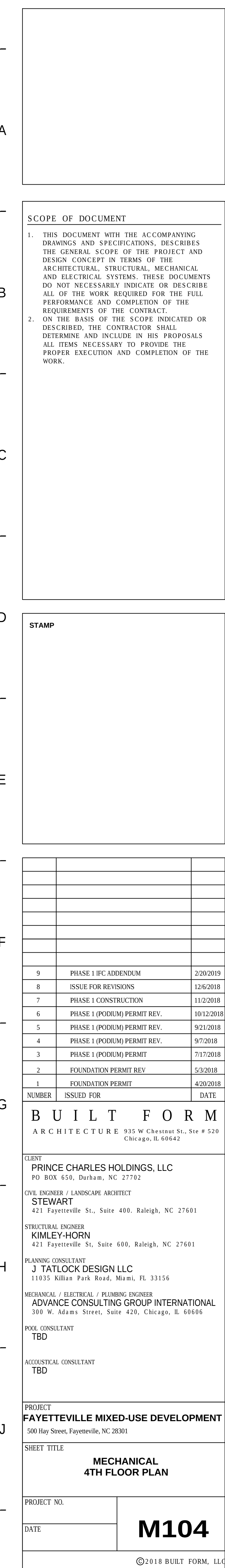
ACOUSTICAL CONSULTANT
TBD

PROJECT
FAYETTEVILLE MIXED-USE DEVELOPMENT
500 Hay Street, Fayetteville, NC 28301

SHEET TITLE
**MECHANICAL
3RD FLOOR PLAN**

PROJECT NO.
M103

DATE

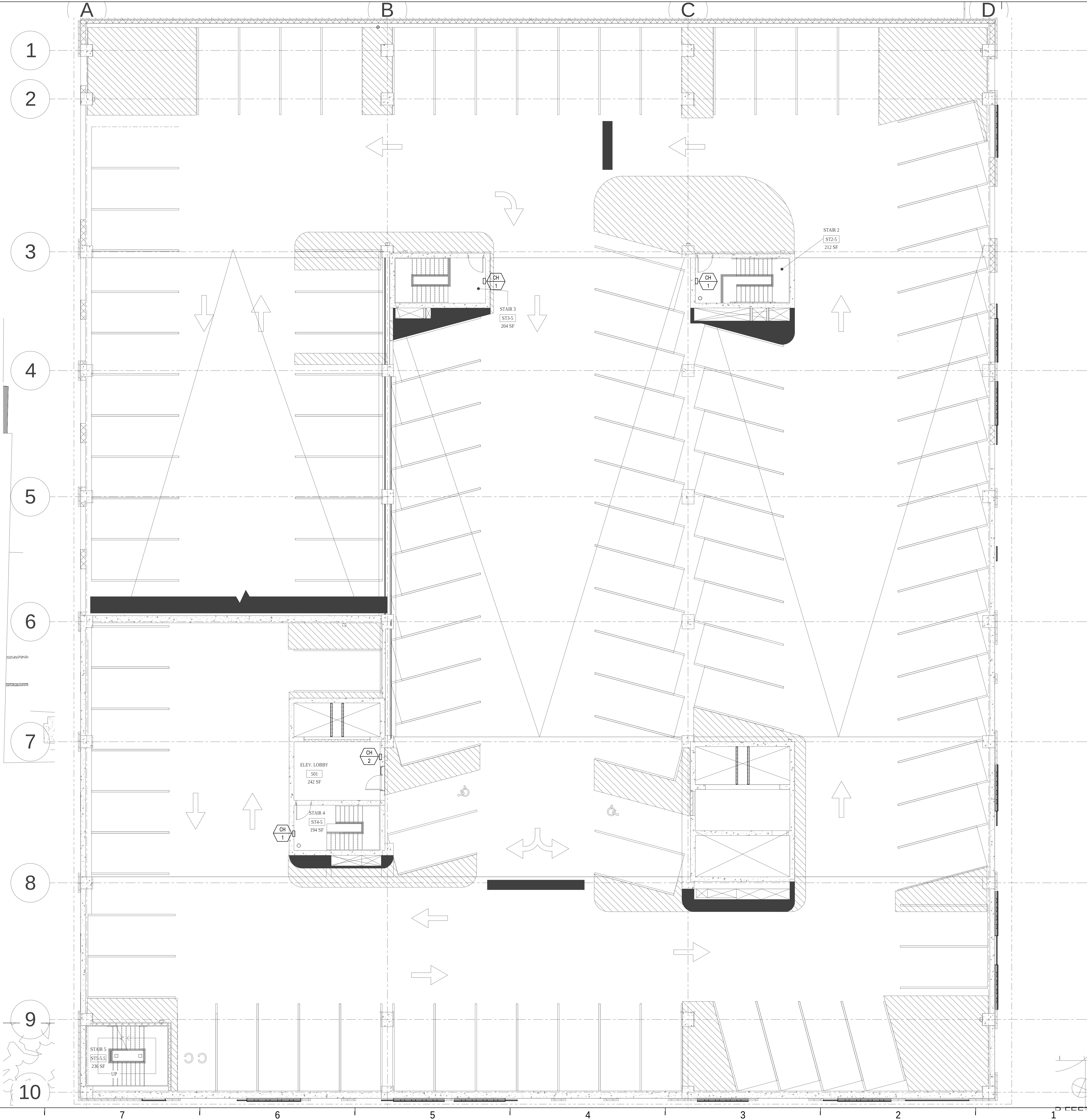


SCOPE OF DOCUMENT

1. THIS DOCUMENT WITH THE ACCOMPANYING DRAWINGS AND SPECIFICATIONS, DESCRIBES THE GENERAL SCOPE OF THE PROJECT AND DESIGN CONCEPT IN TERMS OF THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL SYSTEMS. THESE DOCUMENTS DO NOT NECESSARILY INDICATE OR DESCRIBE ALL OF THE WORK REQUIRED FOR THE FULL PERFORMANCE AND COMPLETION OF THE REQUIREMENTS OF THE CONTRACT.
2. ON THE BASIS OF THE SCOPE INDICATED OR DESCRIBED, THE CONTRACTOR SHALL DETERMINE AND INCLUDE IN HIS PROPOSALS ALL ITEMS NECESSARY TO PROVIDE THE PROPER EXECUTION AND COMPLETION OF THE WORK.

9	PHASE 1 IFC ADDENDUM	2/20/2019
8	ISSUE FOR REVISIONS	12/6/2018
7	PHASE 1 CONSTRUCTION	11/2/2018
6	PHASE 1 (PDIUM) PERMIT REV.	10/12/2018
5	PHASE 1 (PDIUM) PERMIT REV.	9/21/2018
4	PHASE 1 (PDIUM) PERMIT REV.	9/7/2018
3	PHASE 1 (PDIUM) PERMIT	7/17/2018
2	FOUNDATION PERMIT REV	5/3/2018
1	FOUNDATION PERMIT	4/20/2018
NUMBER	ISSUED FOR	DATE

BUILT FORM	
ARCHITECTURE 935 W Chestnut St., Ste # 520 Chicago, IL 60642	
CLIENT	
PRINCE CHARLES HOLDINGS, LLC PO BOX 550, Durham, NC 27702	
CIVIL ENGINEER / LANDSCAPE ARCHITECT	
STEWART 421 Fayetteville St., Suite 400, Raleigh, NC 27601	
STRUCTURAL ENGINEER	
KIMLEY-HORN 421 Fayetteville St., Suite 600, Raleigh, NC 27601	
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ACOUSTICAL CONSULTANT	
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PROJECT	
FAYETTEVILLE MIXED-USE DEVELOPMENT 500 Hay Street, Fayetteville, NC 28301	
SHEET TITLE	
MECHANICAL 4TH FLOOR PLAN	
PROJECT NO.	M104
DATE	
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STAMP

NUMBER	ISSUED FOR	DATE
9	PHASE I IFC ADDENDUM	2/20/2019
8	ISSUE FOR REVISIONS	12/6/2018
7	PHASE I CONSTRUCTION	11/2/2018
6	PHASE I (PODIUM) PERMIT REV.	10/12/2018
5	PHASE I (PODIUM) PERMIT REV.	9/21/2018
4	PHASE I (PODIUM) PERMIT REV.	9/7/2018
3	PHASE I (PODIUM) PERMIT	7/17/2018
2	FOUNDATION PERMIT REV	5/3/2018
1	FOUNDATION PERMIT	4/20/2018

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POOL CONSULTANT
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ACOUSTICAL CONSULTANT
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PROJECT
FAYETTEVILLE MIXED-USE DEVELOPMENT
500 Hay Street, Fayetteville, NC 28301

SHEET TITLE
MECHANICAL
5TH FLOOR PLAN

PROJECT NO.
M105

DATE
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TAG	ROOM	BASIS OF DESIGN (DAIKIN)	NOMINAL TONNAGE	TYPE	CONNECTED TO:		SUPPLY FAN AIR FLOW RATE cfm	COOLING CAPACITY				HEATING CAPACITY				ELECTRICAL			DIMENSIONS		WEIGHT	Options and Accessories
					CONDENSING UNIT	ZONE CHANGE/COVER DEVICE		MAXIMUM TOTAL BTU/h	REQUIRED TOTAL BTU/h	ENTERING AIR	DISCHARGE AIR	MAXIMUM TOTAL BTU/h	REQUIRED TOTAL BTU/h	ENTERING AIR	DISCHARGE AIR	POWER SUPPLY	Min Circuit Amps	Max Overcurrent Protection	Walk/d	Net		
							°F DB			°F WB	°F DB			°Fdb	°Fdb						Voltage - Phase	
VRV-140	Corridor 140/141A	FXMQ12PBWJU	1.0	Ceiling Mounted Ducted (Medium Static)	CU-2 (PHASE1)	No	450	10,537	8,800	76.4	63.5	58.1	14,398	12,900	66.5	92.9	208-230V 1ph	1.4	15.0	27.6 x 11.8 x 27.6	61.7	BRCL173 (1)
VRV-134	Corridor 134	FXMQ15PBWJU	1.3	Ceiling Mounted Ducted (Medium Static)	CU-2 (PHASE1)	No	560	12,833	9,400	75.5	62.9	57.4	16,921	8,800	68.6	83.1	208-230V 1ph	1.5	15.0	39.4 x 11.8 x 27.6	79.4	BRCL173 (1)

Ductwork and filtration flexibility with high CFM and ESP capabilities of up to 0.88" W.G.
 Standard Limited Warranty: 10-year warranty on compressor and all parts
 Ease of installation with auto adjusting airflow at commissioning based on external static pressure
 Easy maintenance with service access from below
 Provide with built-in condensate pump
 Provide field fabricated mixing box with lining on ducted type units. Along with filter housing and MERV 8 filters. Mixing box dimensions to match unit's return opening
 Provide with wall mounted controller with capability to control OSA & return air motorized dampers during occupied mode
 Standard Limited Warranty: 10-year warranty on compressor and all parts

TAG: ROOM	BASIS OF DESIGN (DAIKIN)	NOMINAL TONNAGE	DESCRIPTION	COOLING CAPACITY		HEATING CAPACITY		REFRIGERANT CHARGE		CONNECTION RATIO (%)	ELECTRICAL				DIMENSIONS		EFFICIENCY (NonDucted/Ducted)				
				BTU/h	AMBIENT DESIGN (*F DB / *F DB / WB)	BTU/h	AMBIENT DESIGN (*F DB / WB)	Factory Charge (lbs)	Add'l Refrigerant (lbs)		VOLTAGE-PHASE	MIN CIRCUIT AMPS (MCA)	MAX OVERCURRENT PROTECTION (MOP)	RUNNING CURRENT(A)	(WxHxD)(inch)	WEIGHT (lbs)	EER	IEER	COP 47	COP17	SCHE
CU-2 (PHASE1)	RXT03GTAVI9	3	Air cooled heat pump (1)	30,512	95.5	35,529	22.0 / 20.5	6.4	3.2	75.0	208-230V 1ph	16.5	25.0	15.3	37.0 x 39.0 x 12.6	172.0	12/10	18/16	n/a/n/a	n/a/n/a	n/a/n/a

Manufacturer must be certified, listed, and labeled per AHRI 1230.

System rating data based on design ambient conditions for cooling and for heating.

Submitted performance data must be fully de-rated for all components and accessories, including but not limited to, line length, vertical separation, connection ratio, condenser coil coating, condensing unit, and piping.

Consensing units must have fully modulating INVERTER compressors.

Consensing units must have auto chargeover functions

Demand limiting relay contact must be provided.

EEV actuators must be removable from valve body without disturbing the refrigerant system.

FCU thermostats must provide +/- 1 degree dead-band set-point and control capability.

System must be provided with a Touch Manager controller with WEB based software for displaying up to 8 DII-Net systems with 128 indoor units per system/PC by others.

Manufacturers submittal must include refrigerant piping diagram with pipe diameters, lengths, and refrigerant volume.

Substitute manufacturer shall be responsible for additional piping and refrigerant.

Contractor to verify piping dimensions.

Installing contractor must have successfully completed manufacturers certified installation class within past 36 months.

Contractor to furnish and install insulation on refrigerant piping.

Manufacturers Representative must have local stock of parts and factory certified technician on staff.

Manufacturers Representative shall provide proof of ongoing installation training at their local facility for at least the past 5 years.

Manufacturers Representative shall provide proof of continuous sales and support of their products for at least 15 years.

Mechanical contractor shall be responsible for all direct costs and operating costs increases for 20 years associated with any deviations resulting from changes in design.

Manufacturer must provide 10 years parts warranty on all FCUs, Condensing Units, Model Changeover Devices and Zone Controls. Warranty conditions must be clarified during submittal phase.

3-phase 480 volt systems have published performance data with 200% indoor connected capacity.

Condensing units must be furnished with protective coil coating to withstand ASTM B117 salt spray test in a minimum of 1000 hours. Performance of system must be de-rated for coil coating.

Manufacturer must certify and submit system performance at extreme conditions of 122 degrees FDB ambient in cooling mode and -4 degrees FWB in heating mode.

TAG NO.	UH-1	
SERVING	SERVICE AREA 138	
LOCATION	1ST FLOOR	
FLA	12.7	
MCCP	30	
HEATING MEDIUM	NATURAL GAS	
INPUT MBH	225	
OUTPUT MBH	186.8	
VENT/FLUE SIZE	5"	
VOLTS/PH/HZ	115/1/60	
MANUFACTURER	REZNOR	
MODEL	UDBS	

NOTES:

1. PROVIDE DISCONNECT SWITCH
2. PROVIDE VIBRATION ISOLATORS
3. PROVIDE WITH COMBUSTION AIR/VENT PIPES. FIELD VERIFY ACTUAL PIPE ROUTE LENGTH AND QUANTITY OF ELBOWS. SEE LENGTH AND QUANTITY OF ELBOWS SHALL NOT EXCEED THE ALLOWED BY THE MANUFACTURER. MATERIAL SHALL BE PER MANUFACTURER RECOMMENDATION.
4. MAINTAIN ALL THE MANUFACTURER RECOMMENDED CLEARANCES.
5. PROVIDE WITH 2-STAGE GAS VALVE.
6. PROVIDE WITH STAINLESS STEEL HEAT EXCHANGER
7. PROVIDE AND CONTROL WITH REMOTE THERMOSTAT.
8. PROVIDE WITH 30 DEGREE LOWEROED NOZZLE.

TAG NO.		GEF-1	GEF-2
AREA SERVED	LEVEL 1 GARAGE	LEVEL 1 GARAGE	
LOCATION	LEVEL 1 GARAGE	LEVEL 1 GARAGE	
CFM	7,500	1,500	
ESP (IN. WATER)	0.8"	0.8"	
RPM	883	1,488	
DRIVE TYPE	BELT	BELT	
FAN TYPE	INLINE	INLINE	
ELECTRICAL			
HP OR WATTS	3 HP	3/4 HP	
VOLTS/PH/Hz	208/3/60	208/1/60	
MANUFACTURER	COOK	COOK	
MODEL	245SQJB	135SQJB	
NOTES:	ALL	ALL	

NOTES:

1. FURNISH WITH DISCONNECT SWITCH
2. PROVIDE WITH STARTER
3. PROVIDE WITH VIBRATION ISOLATORS
4. PROVIDE AND CONTROL FCS MULTI CHANNEL CONTROLLER. PROVIDE MANUAL OVERRIDE SWITCH
5. PROVIDE WITH VFD
6. UNIT SHALL BE RATED FOR OUTDOOR INSTALLATION
7. PROVIDE WITH MOTORIZED DAMPER

Tag	Location	Room Type	Area (s.f)	Density (people/ 1000s.f.)	People	Ra	Rp	Outdoor Air (cfm)	Actual Supply Air (CFM)	Actual Outdoor Air (CFM)	Actual Air EXHAUST Air (CFM)	NOTES
134	CORR	Corridors	249	0	0	0.06	0	15	560	15	15	
140	CORR	Corridors	302	0	0	0.06	0	18	300	18	18	
141A	CORR	Corridors	197	0	0	0.06	0	12	150	12	12	
142	LOADING	Inactive	1756	0	0	0	0	0	680	680	680	
143	MAIN ELEC. RM	Inactive	460	0	0	0	0	0	400	400	400	
145	FIRE PUMP ROOM	Inactive	355	0	0	0	0	0	75	75	75	
190	PARKING	Inactive	8599	0	0	0	0	0	0	0	9000	GEF-1&2 OPEN INLET&EXIT (NO DOOR)
		TOTAL	11418					45	1010			

TAG NO.	D-1	D-2	L-1	L-2	L-3	G-1	G-2
SERVICE	SUPPLY	SUPPLY	SUPPLY	RETURN PLENUM	RETURN	RETURN/TRANSFER	RETURN/TRANSFER
TYPE	STEEL	STEEL	STEEL	STEEL	STEEL	STEEL	STEEL
MODEL SIZE	24X24	MATCH BRANCH DUCT	4FT (2)1/5" SLOT	SUITABLE FOR (2) 3" SLOT	4FT (2)1/5" SLOT	24X24	MATCH BRANCH DUCT
DAMPER	YES	YES	YES	NO	NO	YES	YES
FINISH	SELECTION BY ARCH.	SELECTION BY ARCH.	SELECTION BY ARCH.	SELECTION BY ARCH.	SELECTION BY ARCH.	SELECTION BY ARCH.	SELECTION BY ARCH.
MANUFACTURER	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS	TITUS
MODEL	OMNI	R-OMNI	FL-15 HT	LINED PLENUM ONLY	FL-15 JT	350 LR	R-OMNI

NOTES:

1. PROVIDE VOLUME DAMPER FOR AIR FLOW BALANCING PURPOSES IN EACH TAKE-OFF TO A DIFFUSER, REGISTER OR GRILLE.
2. COORDINATE BORDER TYPES, PLASTER FRAMES, AND MOUNTING METHODS WITH THE CEILING TYPE AND WALL CONSTRUCTION AT EACH DIFFUSER, REGISTER, AND GRILLE LOCATION.
3. PROVIDE CABLE OPERATED VOLUME DAMPERS IN THE EVENT ANY VOLUME DAMPER IS LOCATED ABOVE AN INACCESSIBLE CEILING
4. ADJUST THE AIR THROWS AS INDICATED ON THE PLAN
5. PROVIDE SLOT DIFFUSER WITH INSULATED PLENUM
6. PROVIDE LONG PLENUM BY DONCO WHERE NEEDED AT CEILING TRANSITION

D-1, D-2	1-1, G-3	
0 CFM	- 110 CFM	6°
111 CFM	- 225 CFM	8°
226 CFM	- 400 CFM	10°
401 CFM	- 600 CFM	12°
601 CFM	- 700 CFM	15°

SIZE BRANCH DUCTS AND NECK SIZE AS INDICATED ABOVE UNLESS SPECIFIED OTHERWISE ON PLAN.

BRANCH DUCT SHALL MATCH DIFFUSER NECK SIZE WHEN THE NECK SIZE IS INDICATED IN THE DIFFUSER TAG

NECK SIZE SHALL MATCH DIFFUSER BRANCH SIZE WHEN THE BRANCH SIZE IS INDICATED ON PLAN

TAG NO.	CH-1	CH-2
AREA SERVED	SEE PLAN	SEE PLAN
ARRANGEMENT	WALL MOUNTED	WALL MOUNTED
HEATING MEDIUM	ELECTRICITY	ELECTRICITY
KW	1.8	4.8
ELECTRICAL		
VOLTS/PH/HZ	120/1/60	208/1/60
MANUFACTURER	QMARX	QMARX
MODEL	SSAR	SSAR

NOTES:

1. PROVIDE SEMI-RECESSED FRAME (COORDINATE WITH ARCHITECT PRIOR TO PLACING ORDER)
2. PROVIDE WITH INTEGRAL THERMOSTAT
3. PROVIDE COLOR SAMPLE FOR ARCHITECTS COLOR SELECTION
4. PROVIDE DISCONNECT SWITCH
5. REFER TO MANUFACTURER MOUNTING LIMITATION

ALL EQUIPMENT MUST BE PROVIDED WITH ADEQUATE CLEARANCES FOR MAINTENANCE. CONTRACTOR SHALL ADJUST EQUIPMENT AS NECESSARY TO PROVIDE THE APPROPRIATE CLEARANCES.

CONTRACTOR SHALL COORDINATE EQUIPMENT INSTALLATION WITH OTHER TRADES PRIOR TO ORDERING ANY EQUIPMENT

PROVIDE FLEX CONNECTIONS AT ANY CONNECTION BETWEEN THE DUCTS AND EQUIPMENT

PROVIDE FIRE DAMPERS WHEREVER A FIRE RATED WALL/FLOOR IS PENETRATED

ALL MOTORIZED DAMPERS SHALL BE PROVIDED BY TAMCO

GRAB CONDENSATE TO FLOOR DRAIN. PROVIDE CONDENSATE PUMP WHERE REQUIRED

CONDENSATE PIPING SHALL BE INSULATED

PROVIDE EXHAUST DUCTS TO EXHAUST OUTSIDE AIR INTAKE AND EXHAUST FROM ANY SOURCE OF CONTAMINATION. INFORM ENGINEER OF ANY CONFLICT PRIOR TO PURCHASE AND INSTALLATION OF ANY EQUIPMENT

PROVIDE EXHAUST DUCTS TO EXHAUST OUTSIDE AIR INTAKE AND EXHAUST FROM ACCESSIBLE CEILING FLOOR SERVICE

PROVIDE CURBS AND ROOF RAILINGS FOR ROOF MOUNTED EQUIPMENT

ALL OUTSIDE AIR INTAKE AND DISCHARGE LOUVERS SHALL BE LOCATED 10' ABOVE GRADE

ALL U.S.A. INTAKE DUCTS SHALL BE WRAPPED WITH 2" INSULATION AND VAPOR BARRIER

ALL EXHAUST, SUCKY AND RETURN DUCTS SHALL BE INSULATED

ALL EQUIPMENT AND INSTALLATIONS SHALL BE PER NCC MECHANICAL CODE

PROVIDE FIRE DAMPER WHENEVER A FIRE RATED WALL/FLOOR IS PENETRATED.

CONTRACTOR IS RESPONSIBLE TO DETERMINE FIRE RATED WALLS/FLOORS AND EQUIPMENT LOCATION

ALL EXTERIOR DUCTWORK SHALL BE WRAPPED WITH INSULATION, VAPOR AND WEATHER BARRIER. INSULATION SHALL BE A MINIMUM OF R-13

ALL DUCTWORK SHALL BE WRAPPED WITH INSULATION AND VAPOR BARRIER PER TESTER ECC.

ALL DUCTWORK ROUTED IN UNINSULATED AREAS SHALL BE INSULATED WITH INSULATION R-13 MINIMUM R-13

ALL TRANSFER DUCTS SHALL BE UNINSULATED

WASHROOM EXHAUST DUCT SHALL BE ALUMINUM

ALL DUCTWORK SHALL BE WRAPPED WITH INSULATION WITH R-8 INSULATION

ALL OUTDOOR EXPOSED DUCTWORK SHALL BE WRAPPED WITH R-13 INSULATION AND WEATHER JACKET AND VAPOR BARRIER.

ALL EXHAUST DUCTS SHALL BE WRAPPED WITH INSULATION AND VAPOR BARRIER

BOOSTER FAN WITH AN INLINE TUP. PRIOR TO DOING SO, CONTRACTOR IS RESPONSIBLE TO DETERMINE THE EXISTING DUCT TO BE INSTALLED AND DETERMINE IF THE EXISTING DUCTWORK IS ADEQUATE TO BOOSTER FAN. INLINE TUP INLET TRIP TO BE INSTALLED PRIOR TO BOOSTER FAN BEING INSTALLED.

REFRIGERANT PIPES ARE SHOWN ON PLAN DIAGRAMMATICALLY AS ONE.

CONNECT DUCTWORK TO EQUIPMENT WITH INSULATED FLEXIBLE CONNECTION

PROVIDE 1/2" INSULATION ON ALL DUCTWORK

ALL VERTICAL PIPES/DUCTS ROUTING MUST BE COORDINATED WITH PLUMBING FIXTURES AND ALL OTHER COMPONENTS ROUTED IN THE SAME SIGHT PRIOR TO ORDERING EQUIPMENT AND INSTALLATION OF EQUIPMENT ON PLAN AREAS

DIAGRAMMATIC AND APPROXIMATE FINAL LOCATION SHALL BE DETERMINED ON SITE

COORDINATE COORDINATION WITH OTHER TRADES AND FIELD CONDITIONS. ALL INSTALLATIONS SHALL BE IN ACCORDANCE WITH THE MECHANICAL RECOMMENDATION.

PROVIDE FIRE DAMPER WHENEVER A FIRE RATED WALL/FLOOR IS PENETRATED.

DAMPER SIZE SHALL NOT OBSTRUCT AIR FLOW.

ALL OUTSIDE EXHAUSTS SHALL BE PROVIDED WITH LOCKING DAMPER TO ADJUST THE AIR FLOW AND ALL MOTORIZED DAMPERS TO SHUT OFF OUTSIDE AIR DURING UNOCCUPIED HOURS PER NCC6050.2.4.1.1.

HEAT PUMPS HAVE SUPPLEMENTARY ELECTRIC RESISTANCE HEAT WHICH CONTROLS THE TEMPERATURE OF THE WATER BEING CIRCULATED WHEN THE HEAT PUMP COMES OFF THE HEATING LOAD.

THE SYSTEM WILL BE CAPACITY OF LESS THAN 850,000 BTU/H. A HEAT STOP OUTDOOR TEMPERATURE LOCKOUT SHALL BE PROVIDED TO PREVENT SUPERHEATING HEAT EXCHANGE IN THE SYSTEM.

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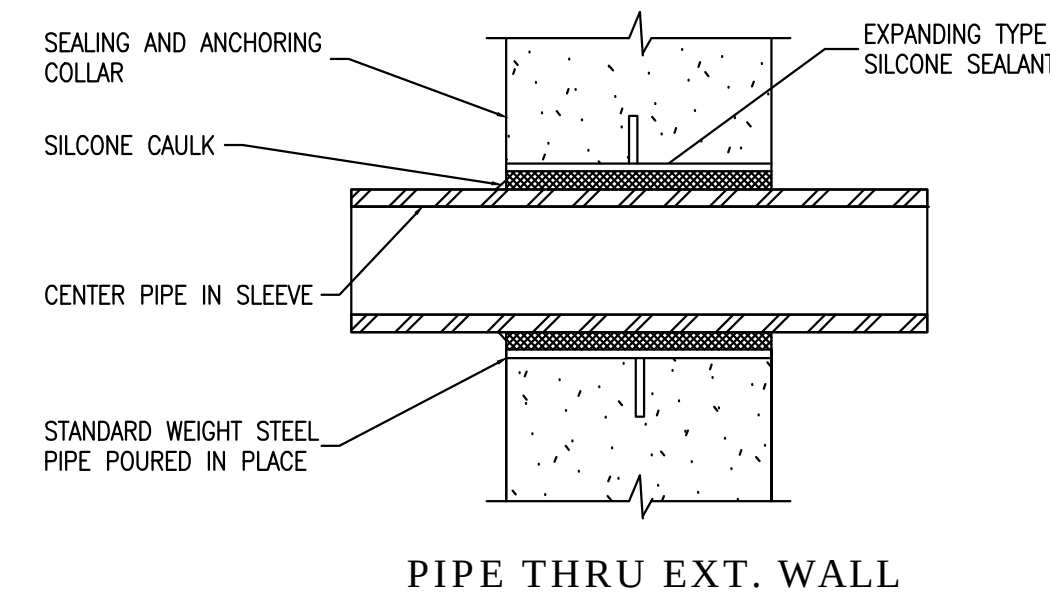
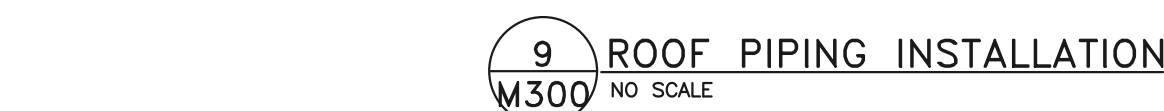
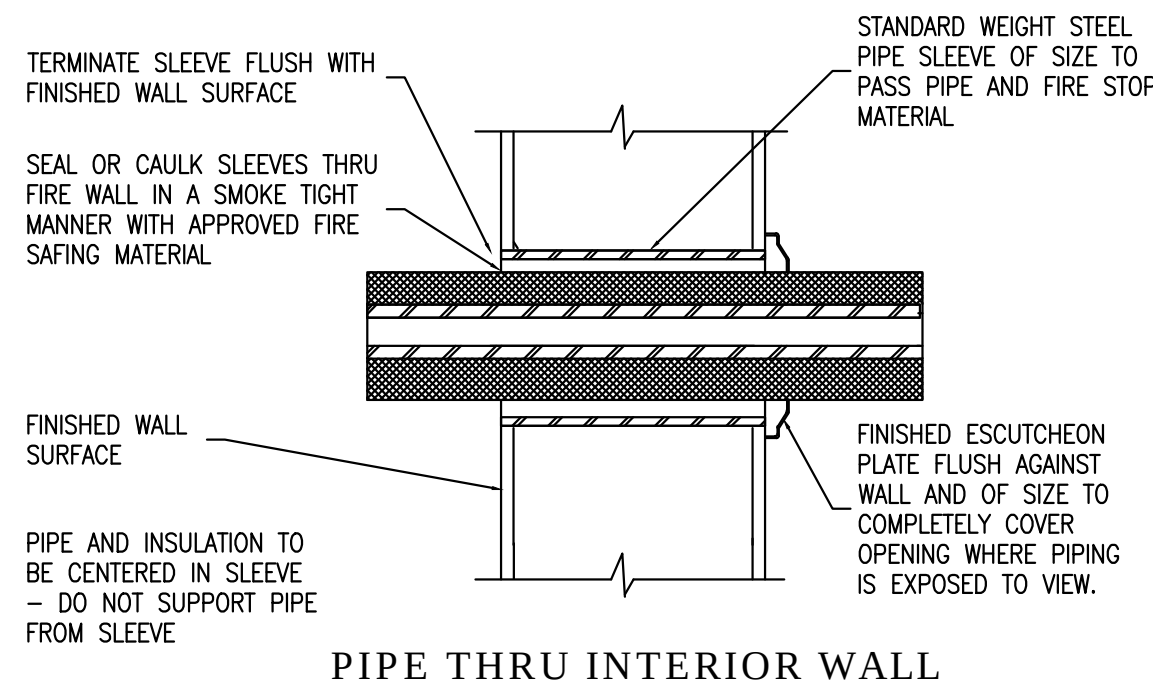
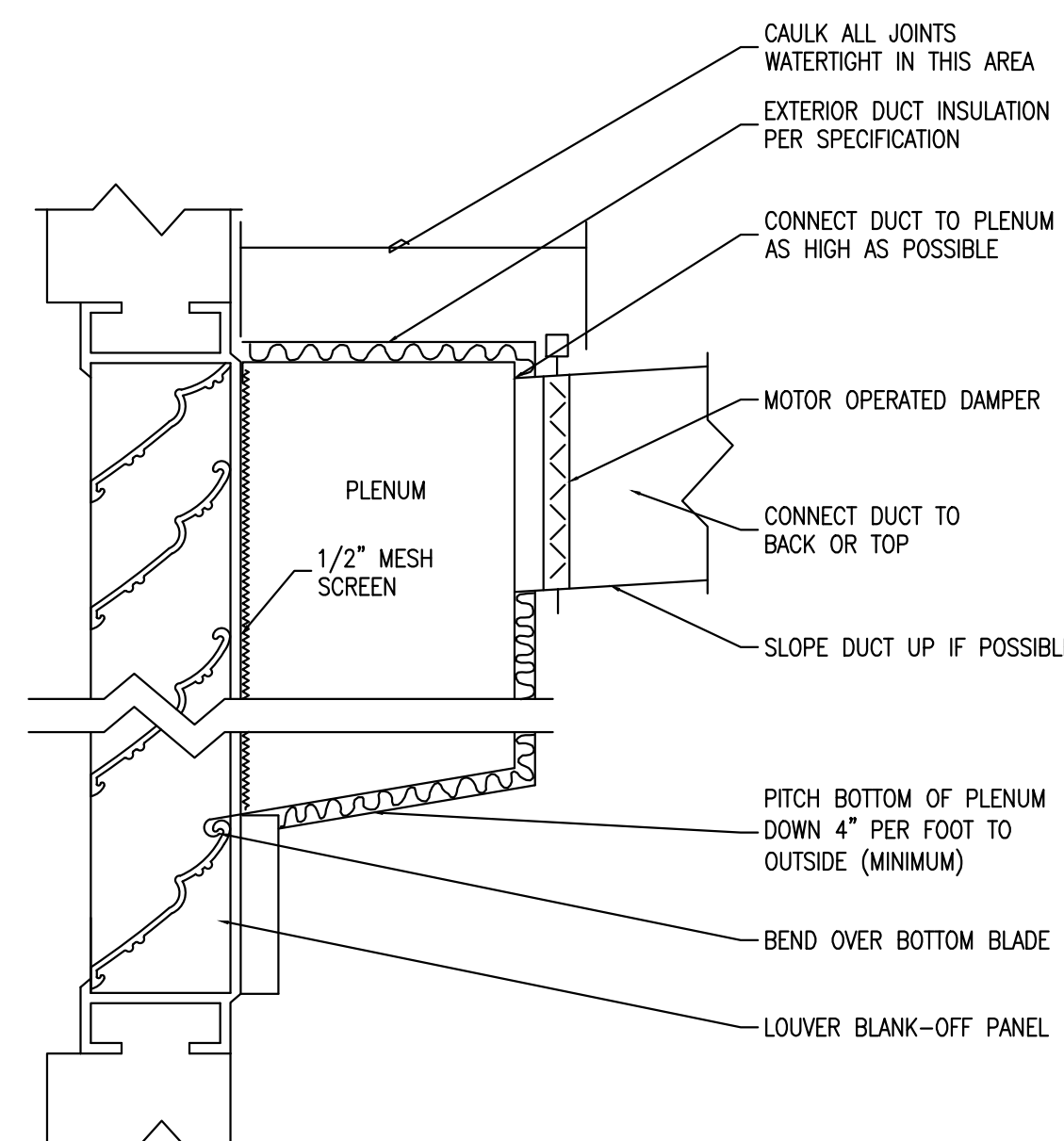
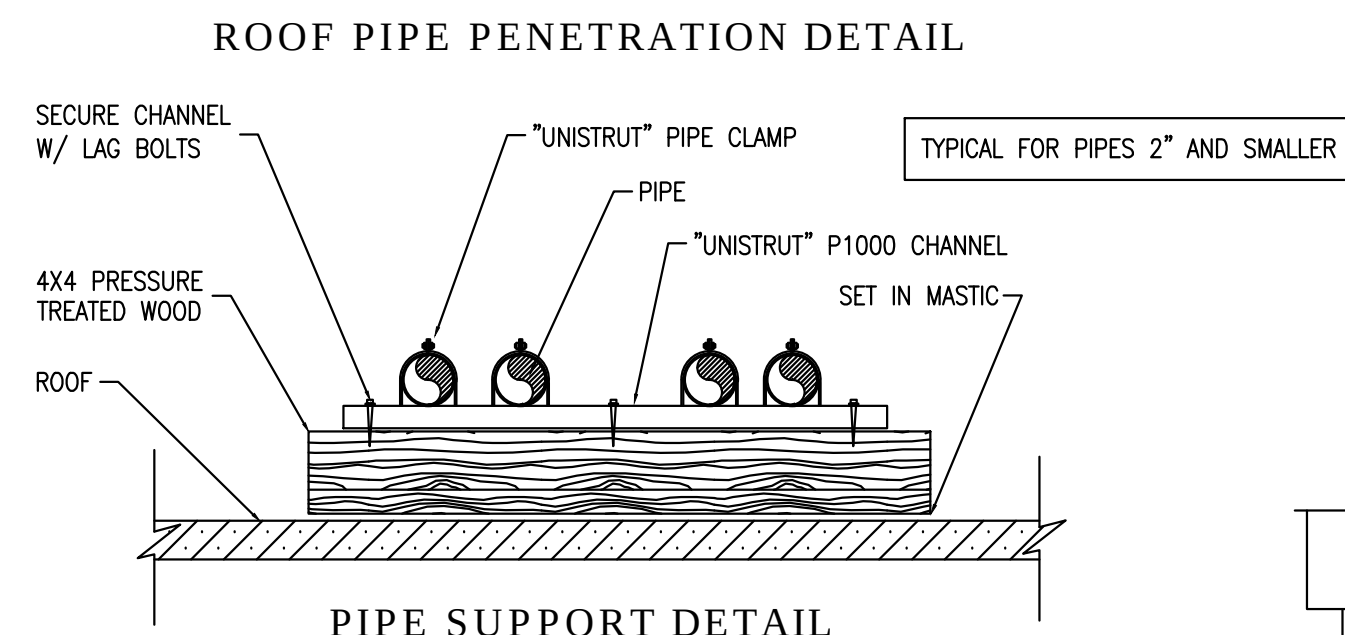
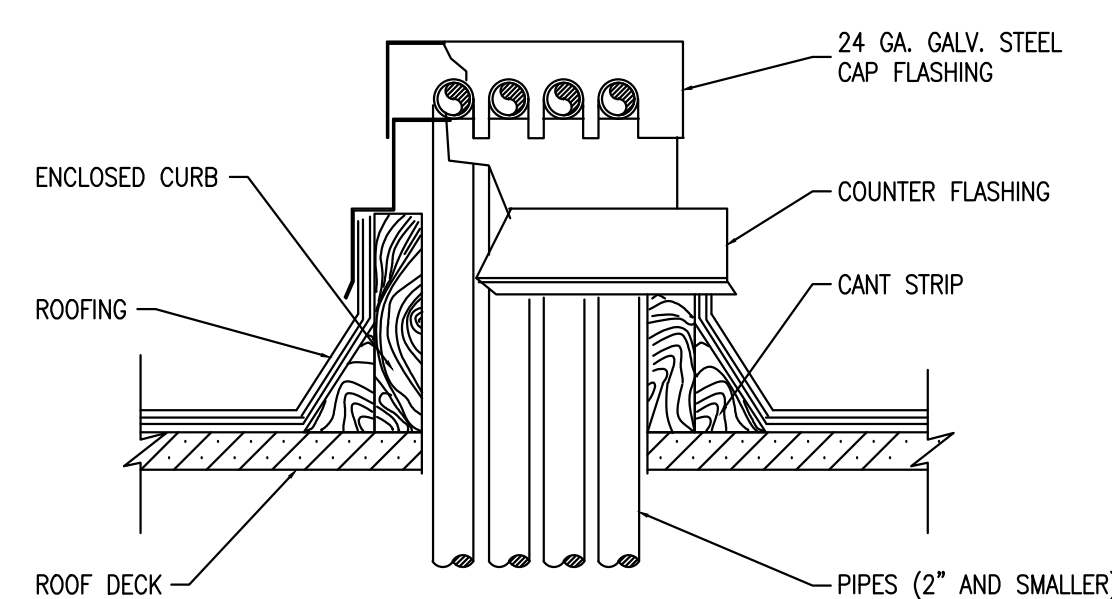
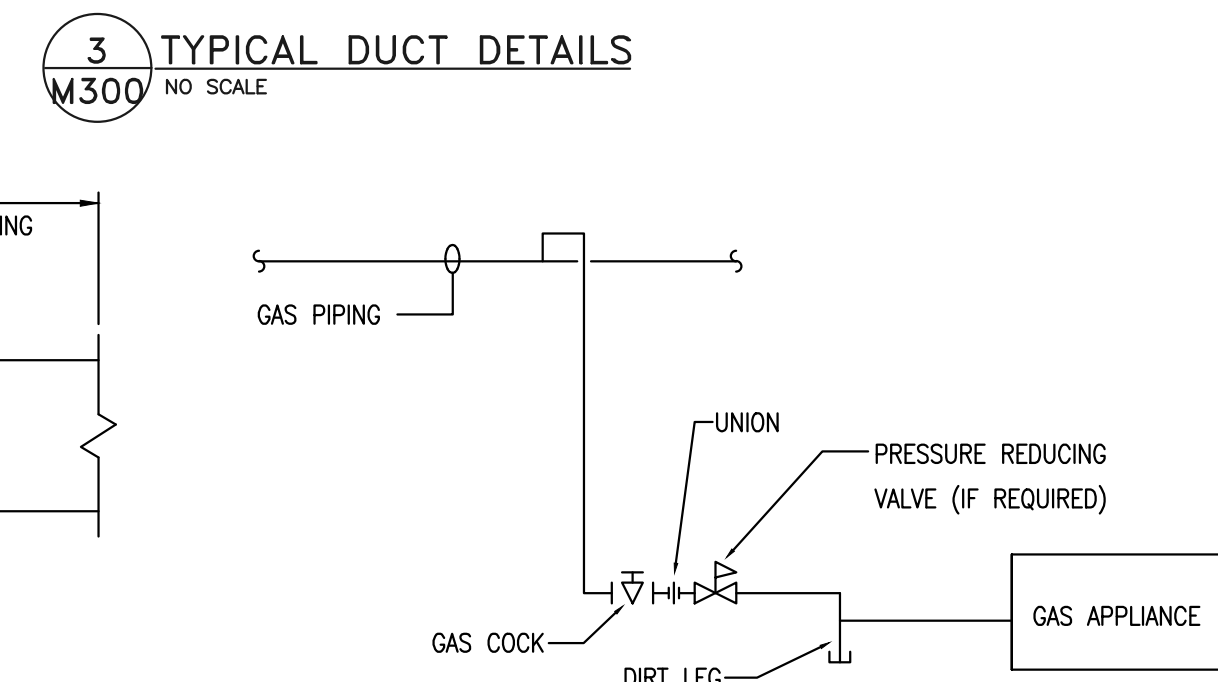
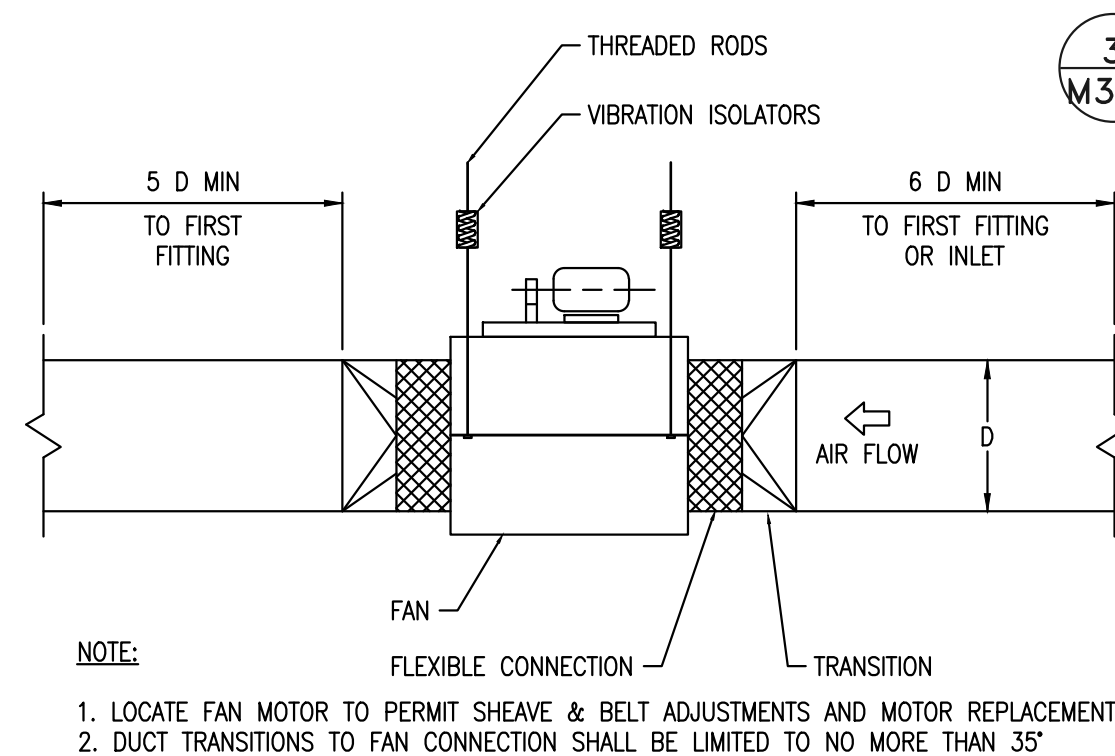
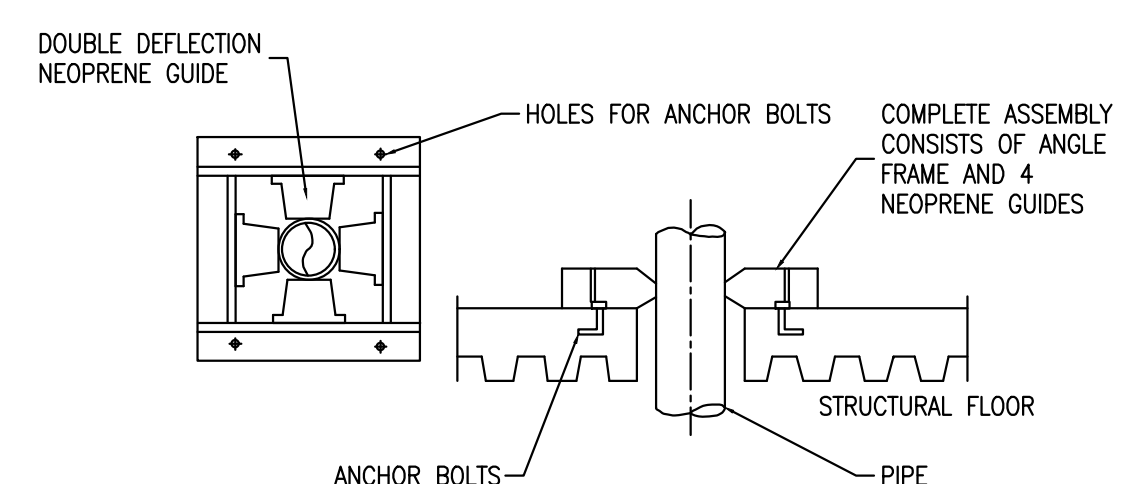
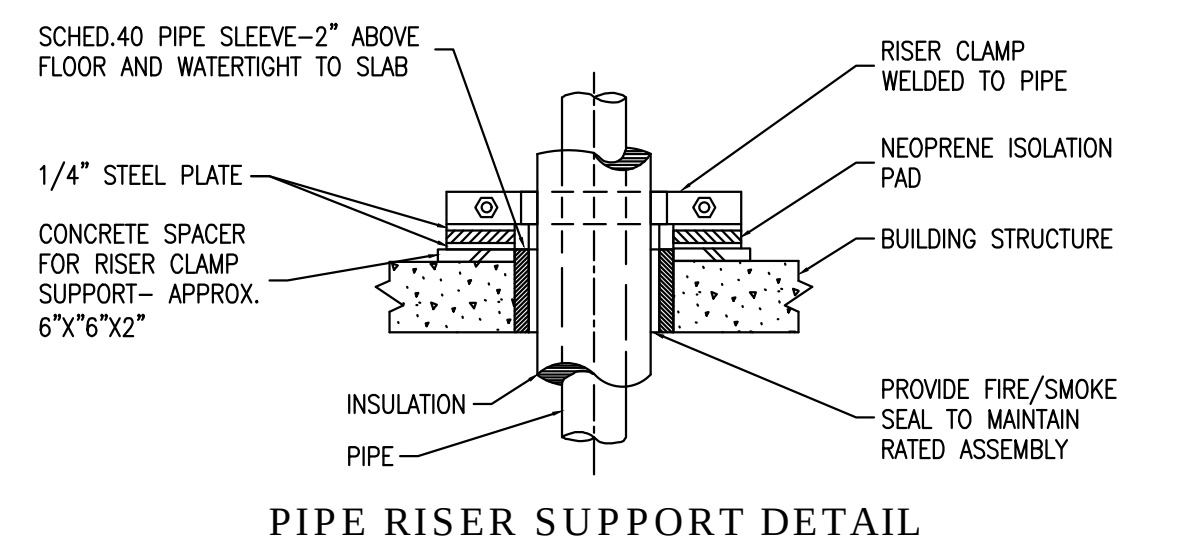
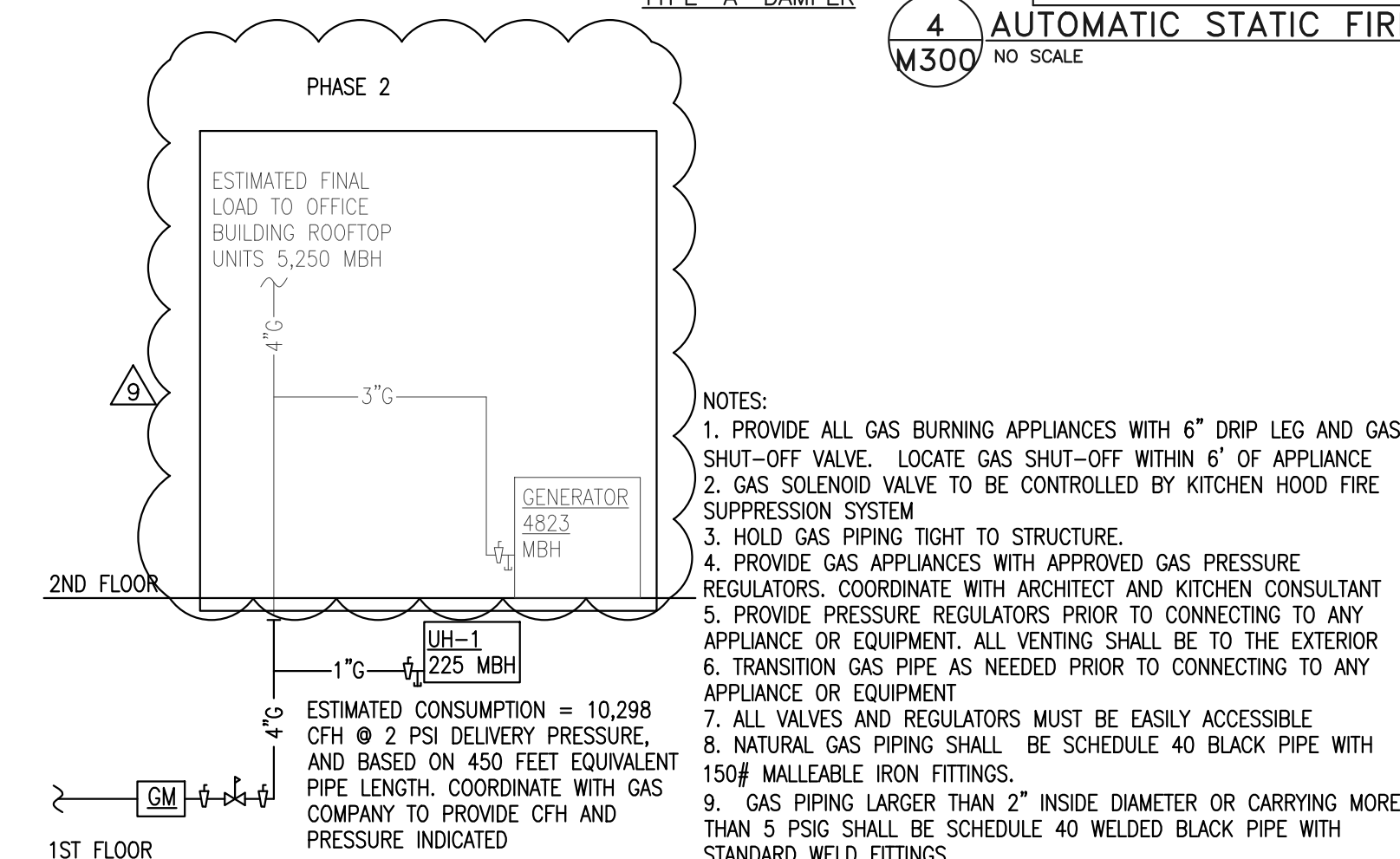
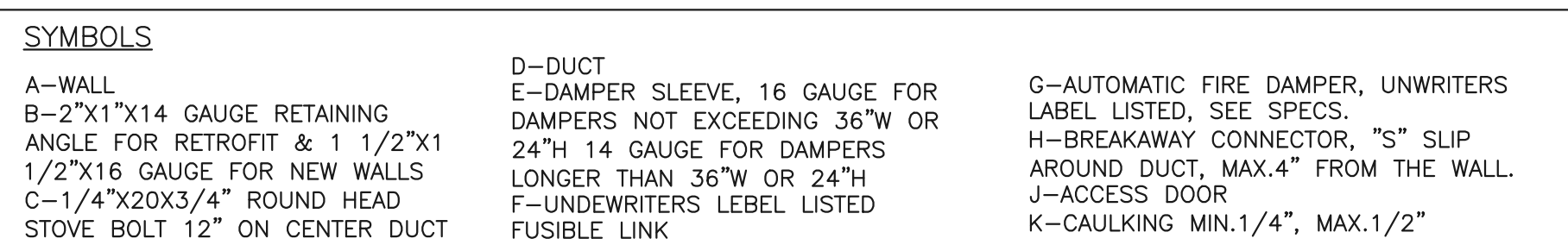
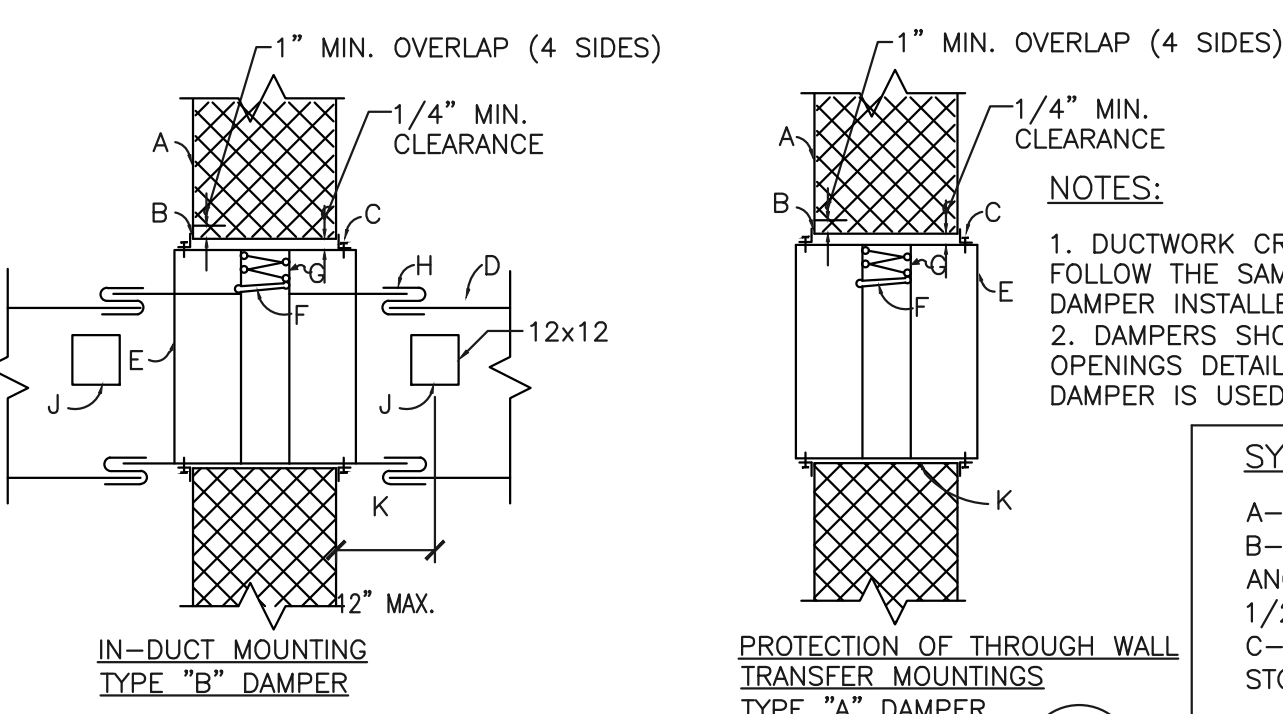
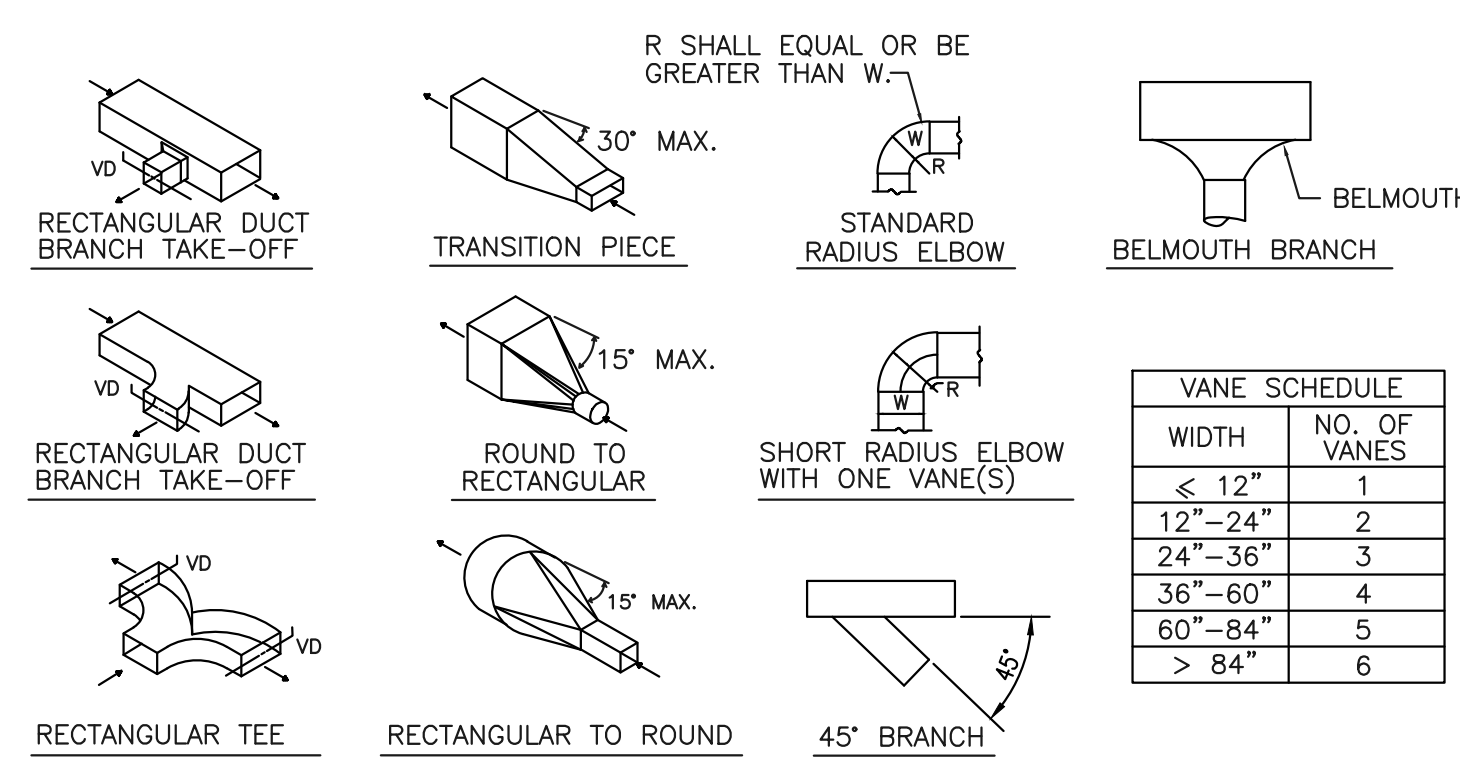
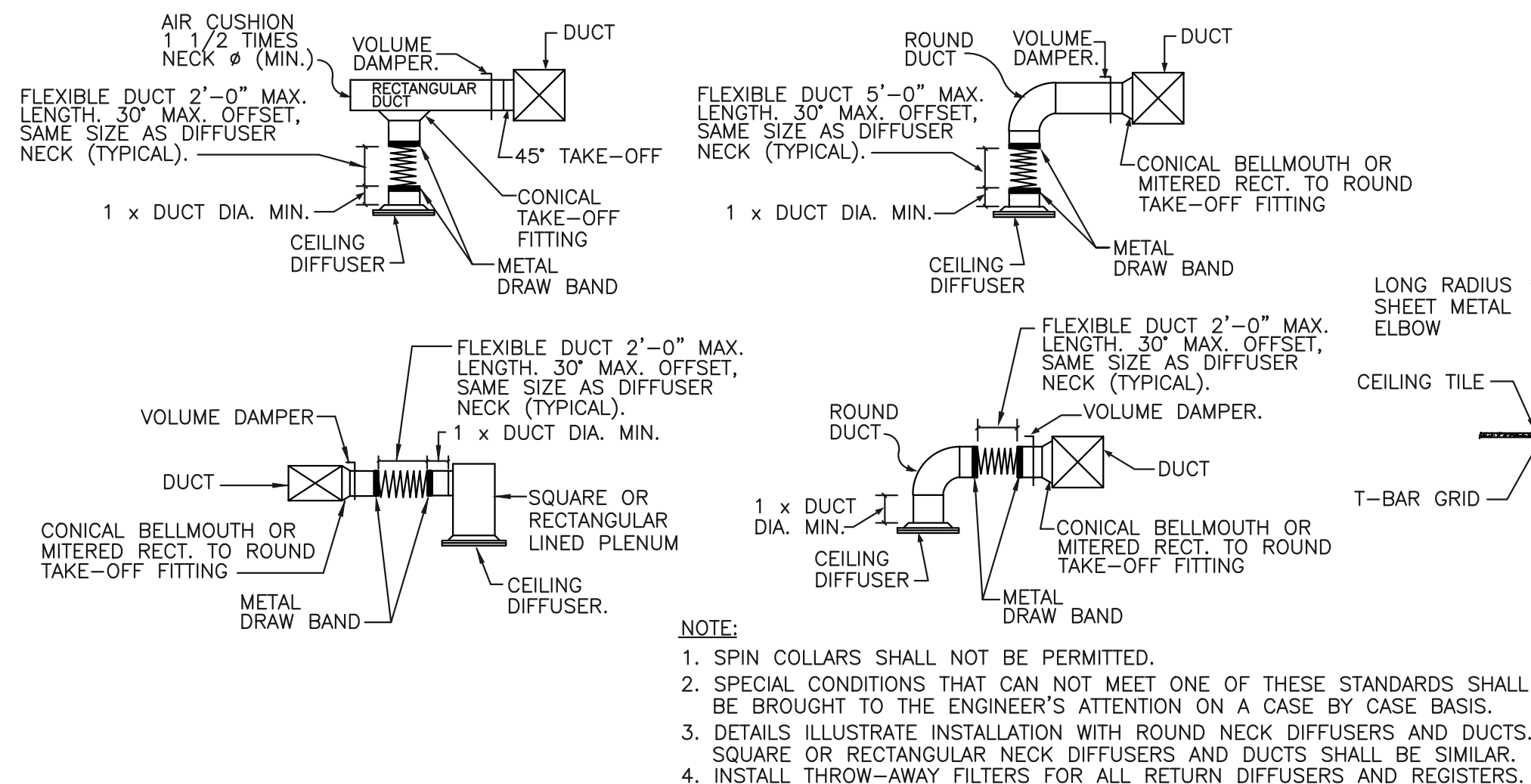
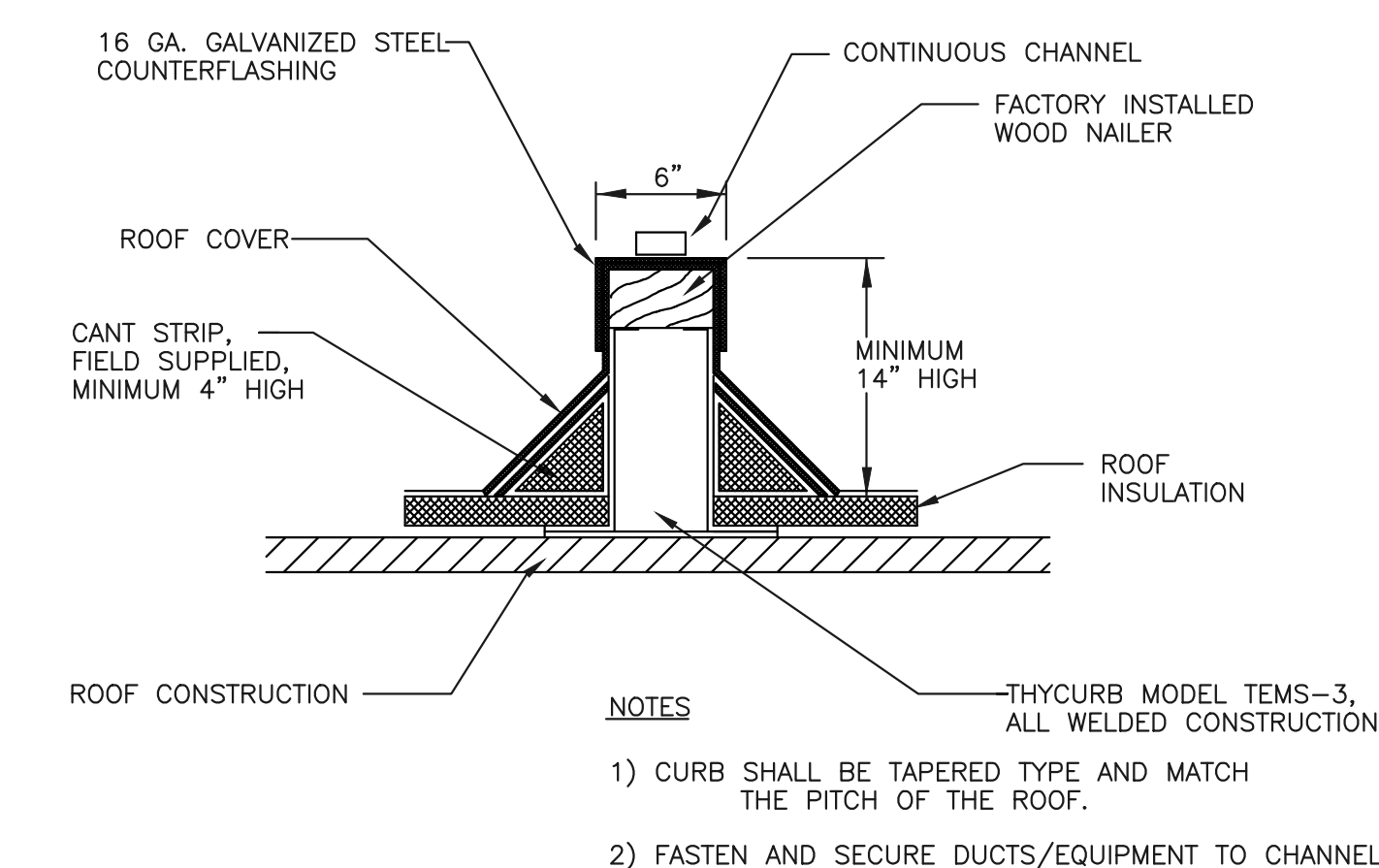
POL CONSULTANT
TBD

ACOUSTICAL CONSULTANT
TBD

PROJECT
FAYETTEVILLE MIXED-USE DEVELOPMENT
500 Hay Street, Fayetteville, NC 28401

SHEET TITLE
MECHANICAL SCHEDULES

PROJECT NO.



VANE SCHEDULE	
WIDTH	NO. OF VANES
≤ 12"	1
12"–24"	2
24"–36"	3
36"–60"	4
60"–84"	5
> 84"	6

SCOPE OF DOCUMENT	
1.	THIS DOCUMENT WITH THE ACCOMPANYING DRAWINGS AND SPECIFICATIONS, DESCRIBES THE GENERAL SCOPE OF THE PROJECT AND DESIGN CONCEPT IN TERMS OF THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL SYSTEMS. THESE DOCUMENTS DO NOT NECESSARILY INDICATE OR DESCRIBE ALL OF THE WORK REQUIRED FOR THE FULL PERFORMANCE AND COMPLETION OF THE REQUIREMENTS OF THE CONTRACT.
2.	ON THE BASIS OF THE INFORMATION INDICATED OR DESCRIBED, THE CONTRACTOR SHALL DETERMINE AND INCLUDE IN HIS PROPOSALS ALL ITEMS NECESSARY TO PROVIDE THE POWER EXECUTION AND COMPLETION OF THE WORK.

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3	PHASE 1 (PODIUM) PERMIT	7/17/2018
2	FOUNDATION PERMIT REV	5/3/2018
1	FOUNDATION PERMIT	4/20/2018
NUMBER	ISSUED FOR	DATE

B U I L T F O R M
ARCHITECTURE 935 W Chestnut St., Ste # 520
Chicago, IL 60642

CLIENT
PRINCE CHARLES HOLDINGS, LLC
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STRUCTURAL ENGINEER
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11035 Killian Park Road, Miami, FL 33156

MECHANICAL / ELECTRICAL / PLUMBING ENGINEER
ADVANCE CONSULTING GROUP INTERNATIONAL
300 W. Adams Street, Suite 420, Chicago, IL 60606

POOL CONSULTANT	
TBD	

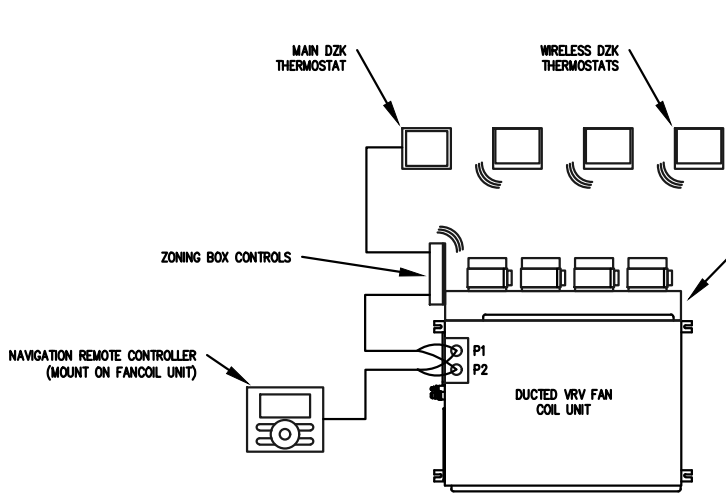
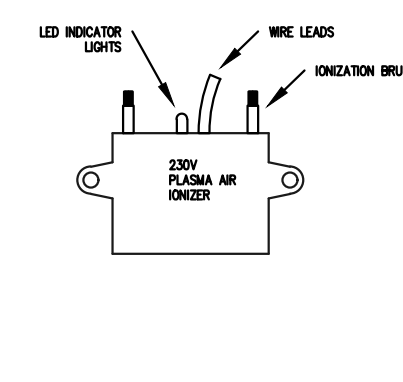
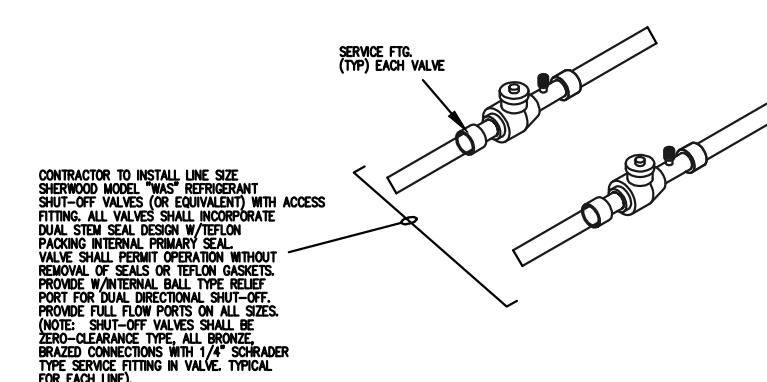
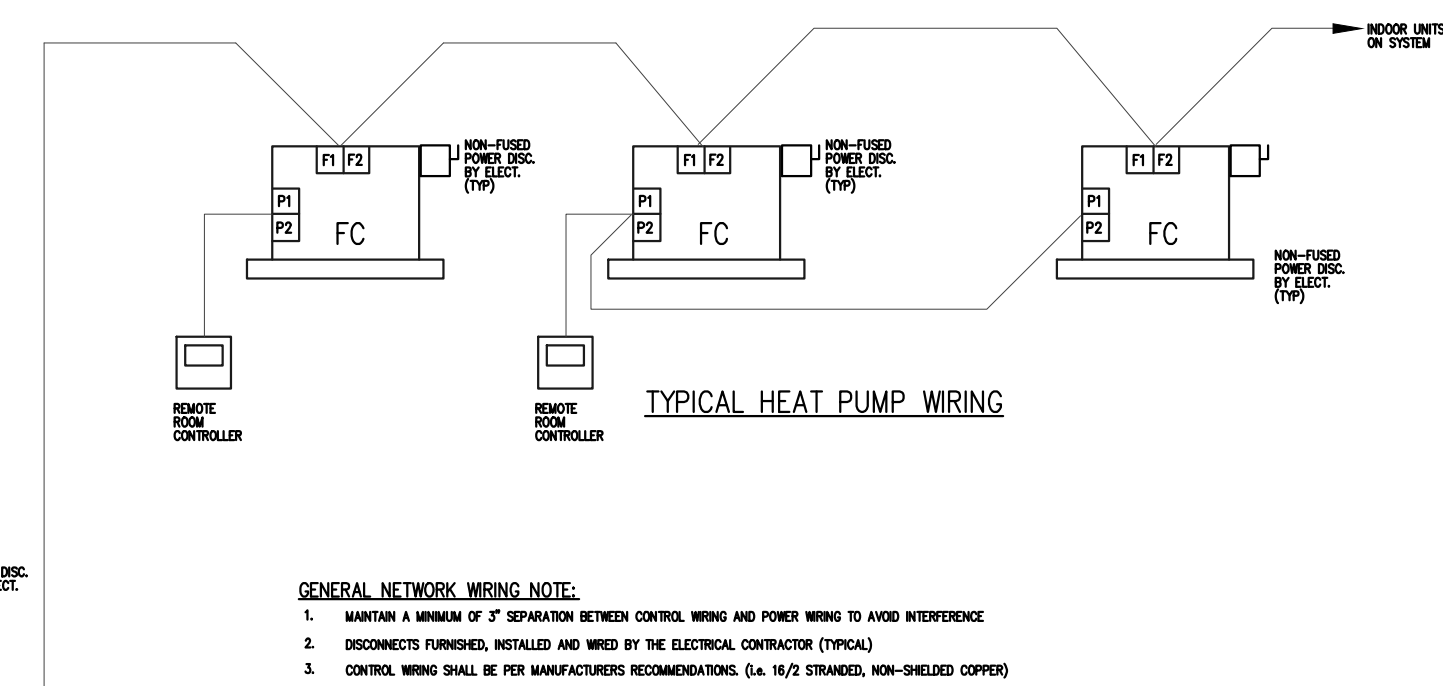
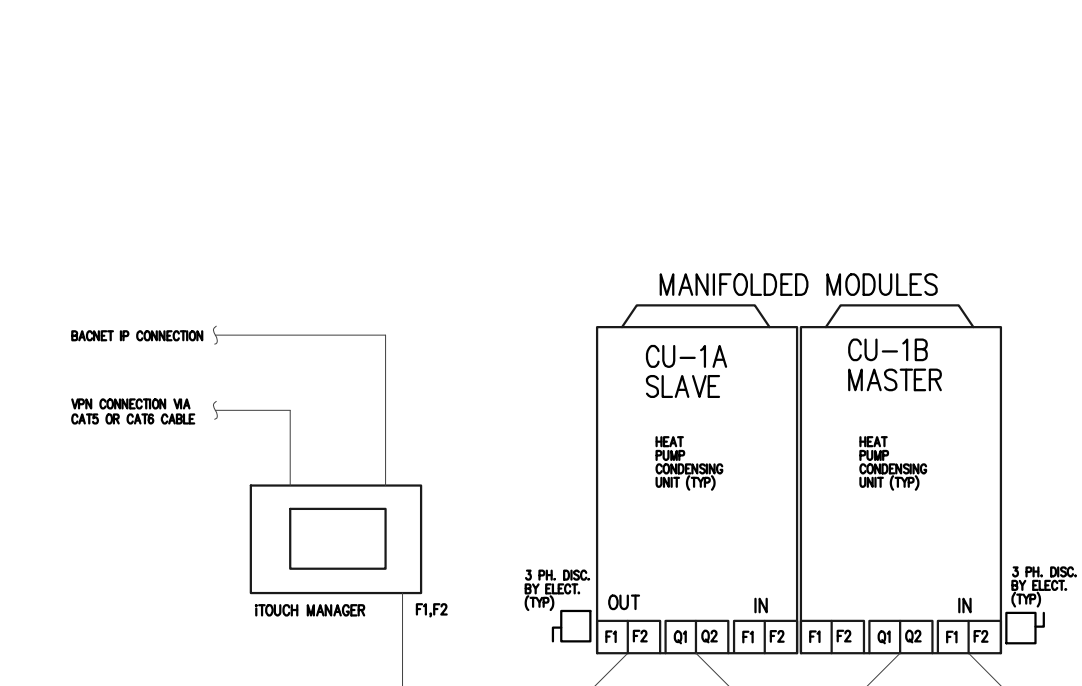
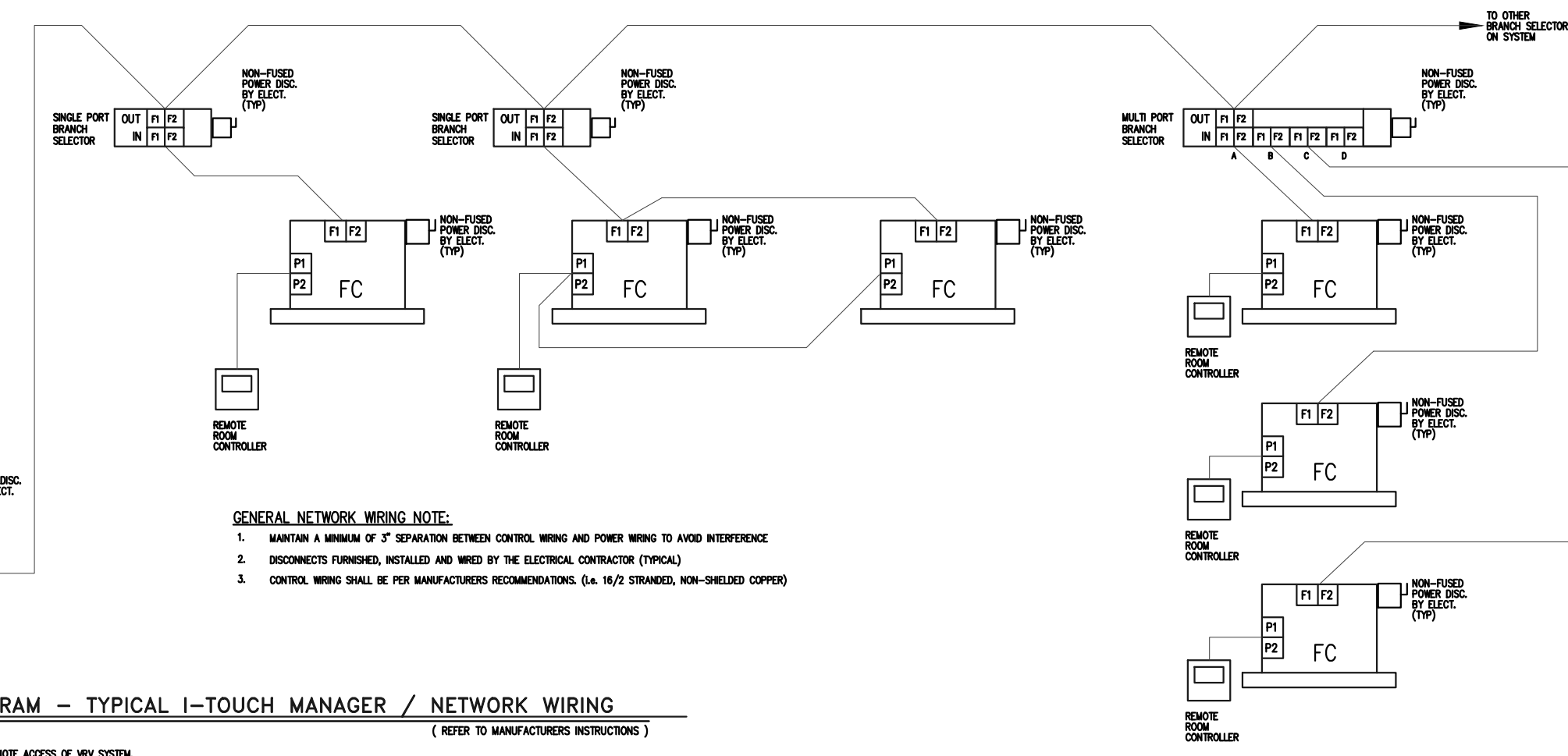
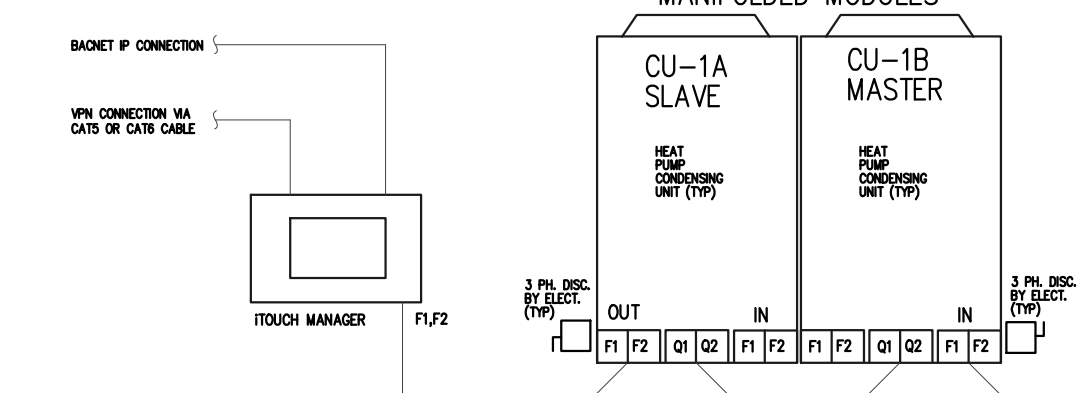
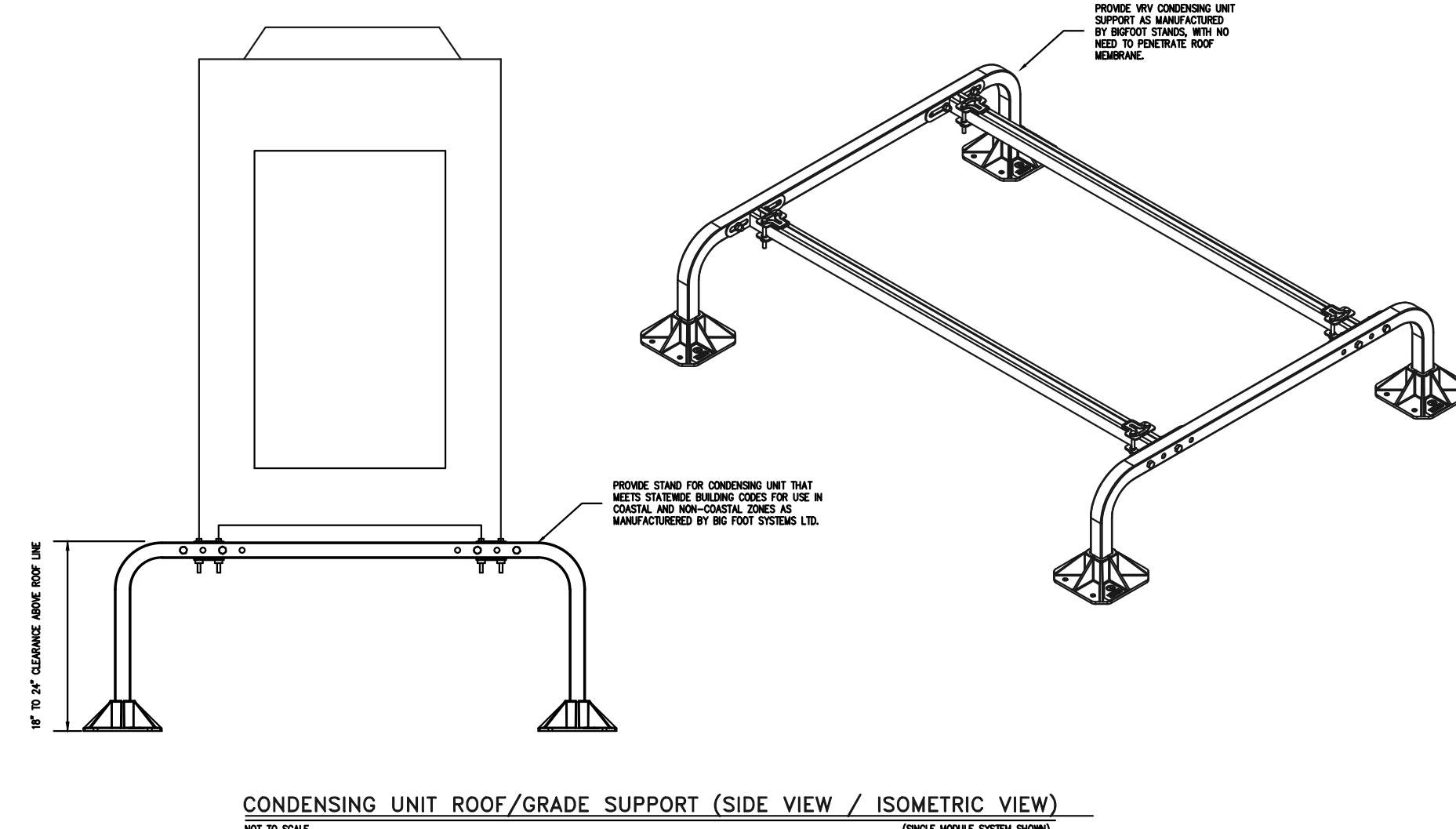
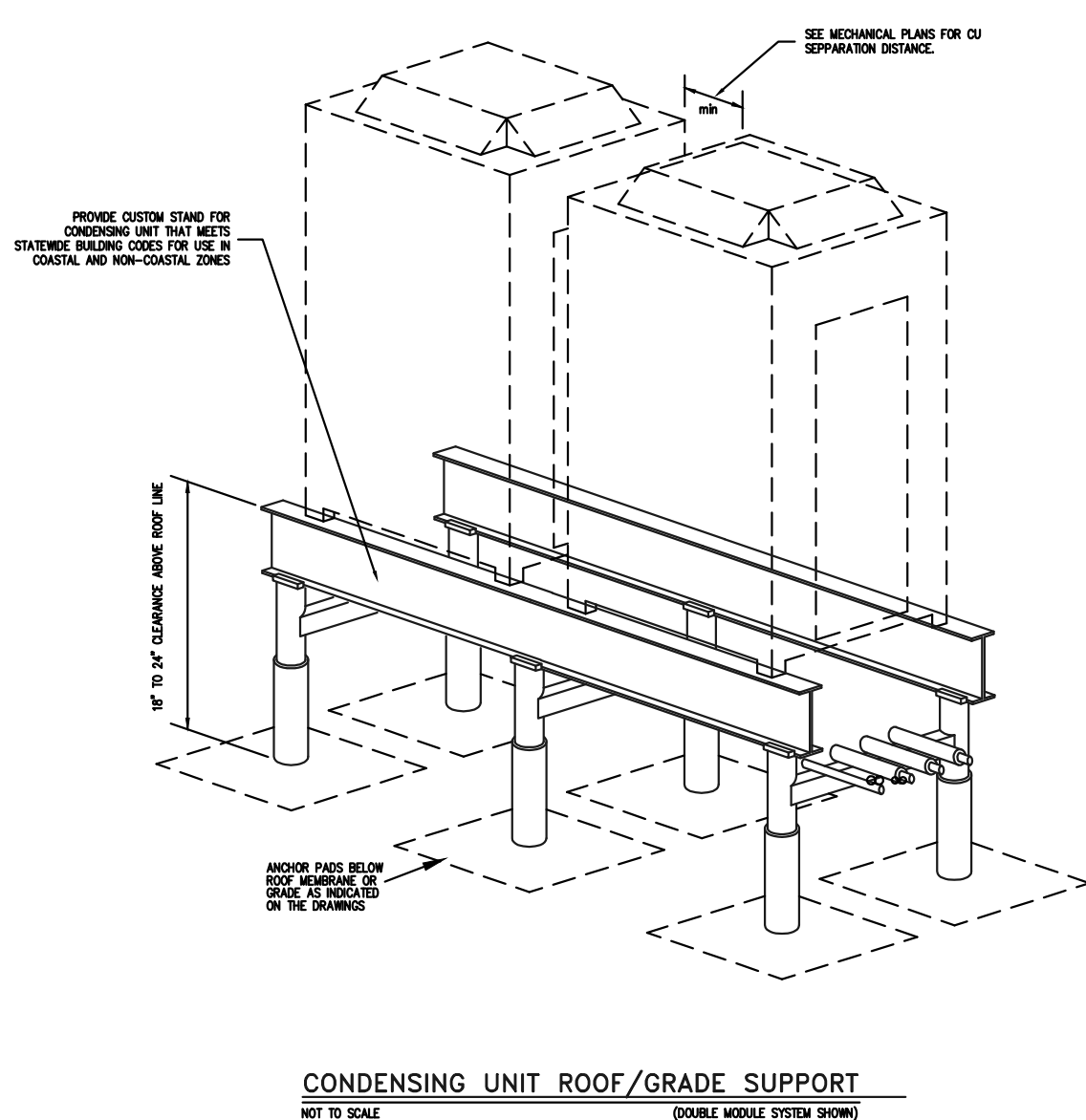
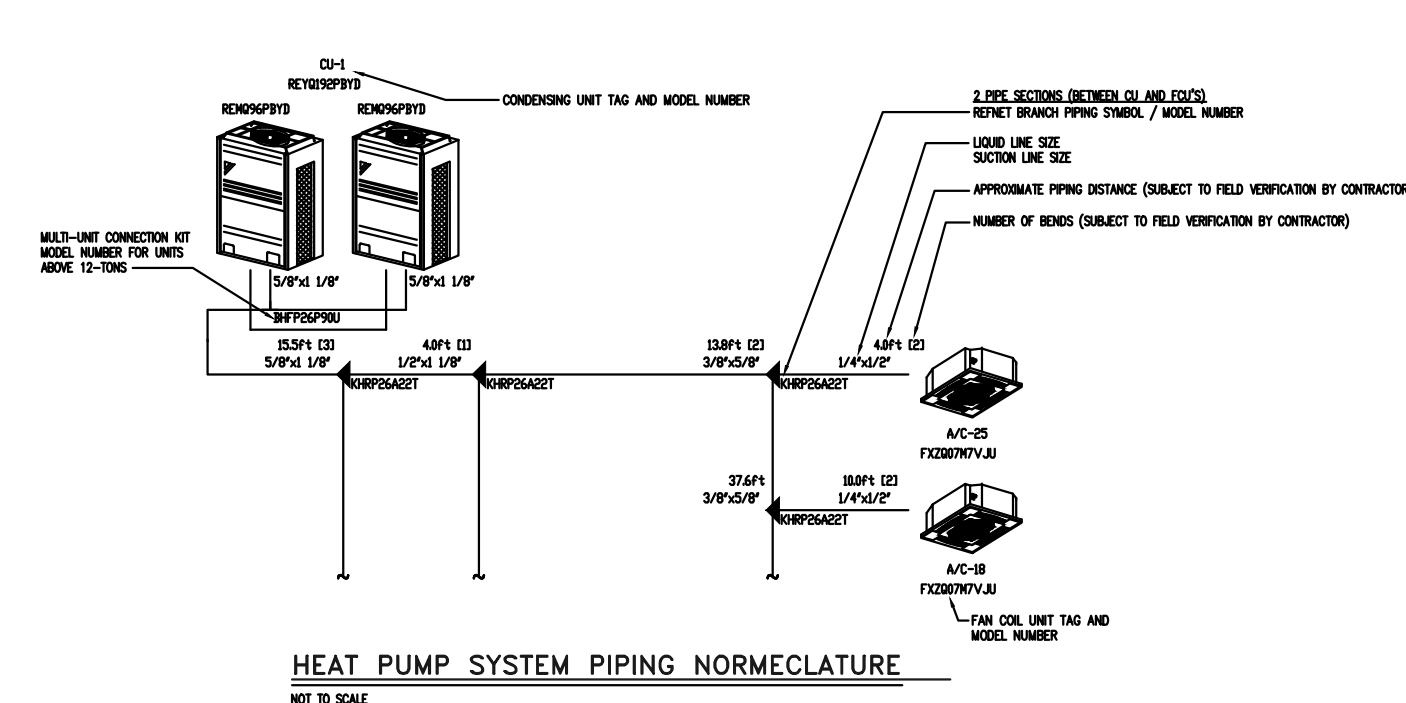
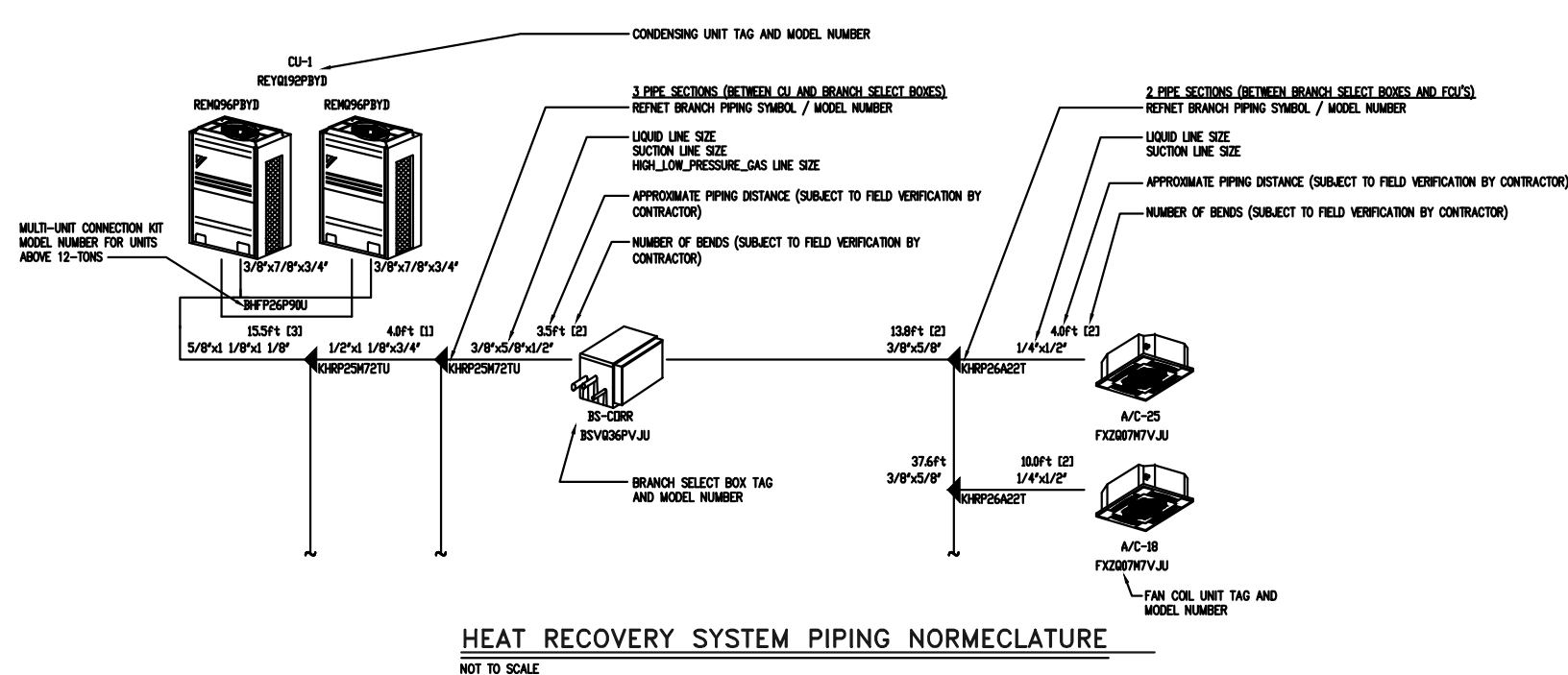
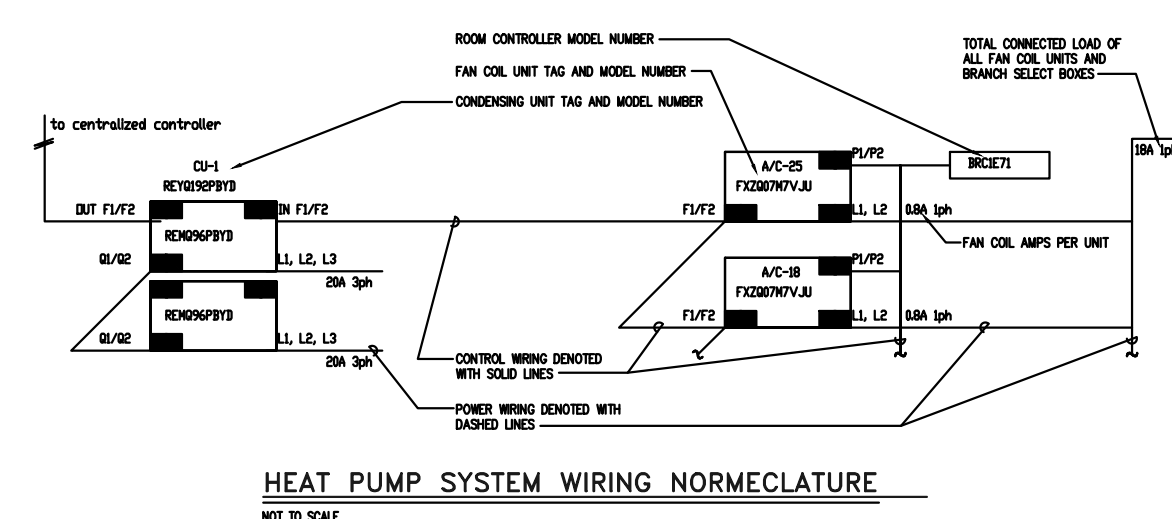
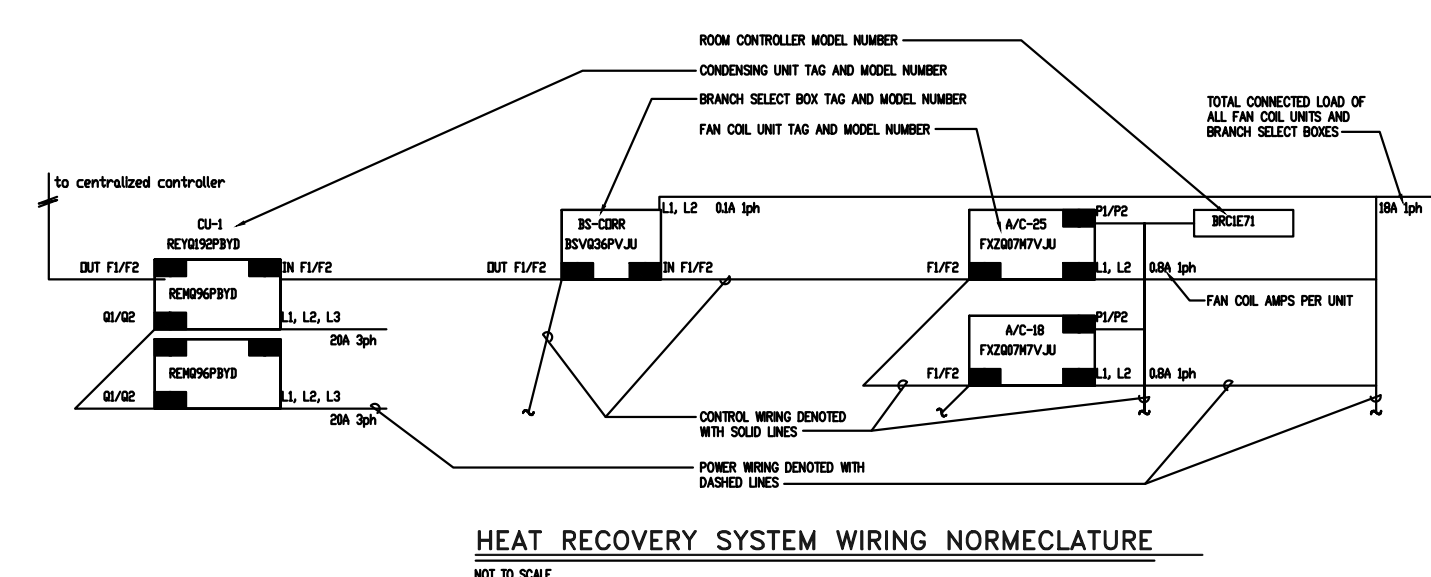
ACOUSTICAL CONSULTANT
TBDPROJECT
FAYETTEVILLE MIXED-USE DEVELOPMENT

500 Hay Street, Fayetteville, NC 28301
SHEET TITLE

MECHANICAL DETAILS

PROJECT NO.	
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DATE	M300
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SCOPE OF DOCUMENT

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B U I L T F O R M

ARCHITECTURE 935 W Chestnut St., Ste # 52
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421 Fayetteville St., Suite 400, Raleigh, NC 27601

STRUCTURAL ENGINEER
KIMLEY-HORN
421 Fayetteville St., Suite 600, Raleigh, NC 27601

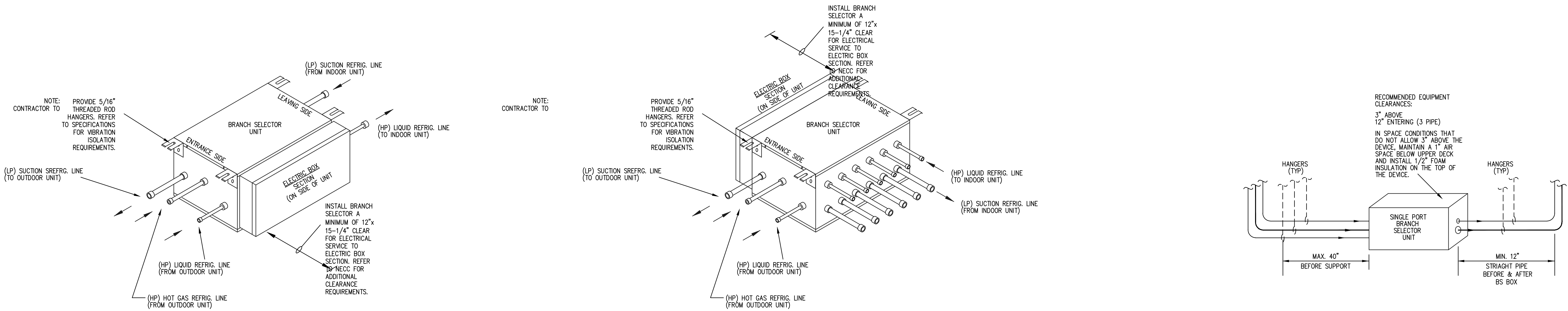
PLANNING CONSULTANT
J. TATLOCK DESIGN LLC
11035 Killian Park Road, Miami, FL 33156

MECHANICAL / ELECTRICAL / PLUMBING ENGINEER
ADVANCE CONSULTING GROUP INTERNATIONAL
300 W. Adams Street, Suite 420, Chicago, IL 60606

POOL CONSULTANT
TBD

ACOUSTICAL CONSULTANT
TBD

PROJECT	
FAYETTEVILLE MIXED-USE DEVELOPMENT	
500 Hay Street, Fayetteville, NC 28301	
SHEET TITLE	
MECHANICAL VRF SYSTEM DETAILS	
PROJECT NO.	M301
DATE	
© 2018 BUILT FORM, LLC	



TYPICAL SINGLE PORT BRANCH SELECTOR PIPING

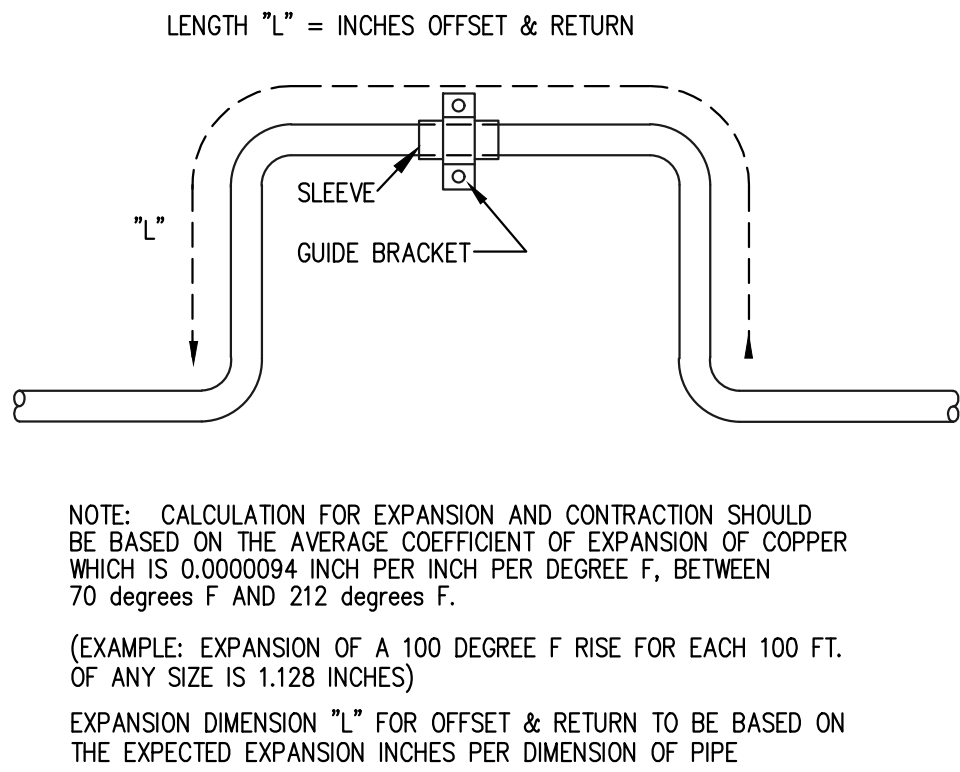
NOT TO SCALE
NOTES:
1. ALL MECHANICAL EQUIPMENT SHALL BE IN COMPLIANCE WITH ASHRAE 90.1

TYPICAL MULTI-PORT BRANCH SELECTOR PIPING

NOT TO SCALE
NOTES:
1. ALL MECHANICAL EQUIPMENT SHALL BE IN COMPLIANCE WITH ASHRAE 90.1

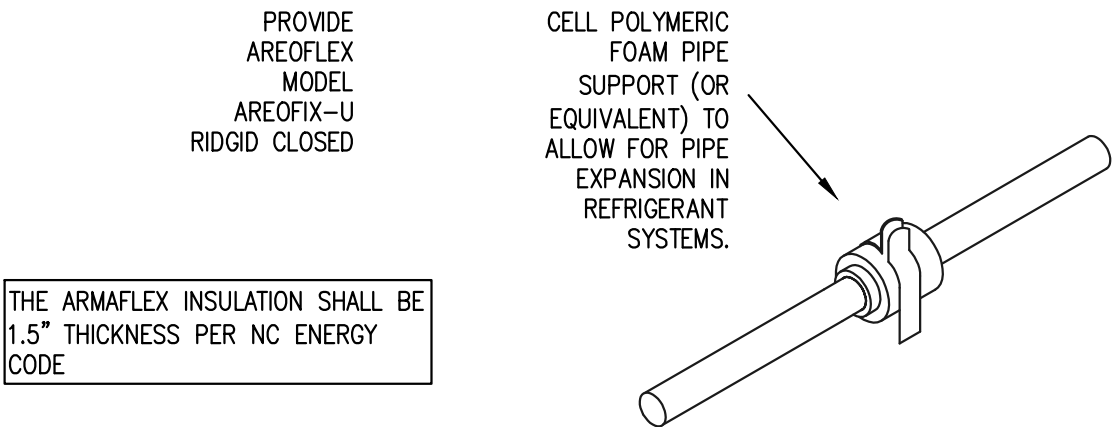
RECOMMENDED PIPE CLEARANCES FOR BRANCH SELECTOR UNITS

NOT TO SCALE (REFER TO MANUFACTURERS INSTRUCTIONS)



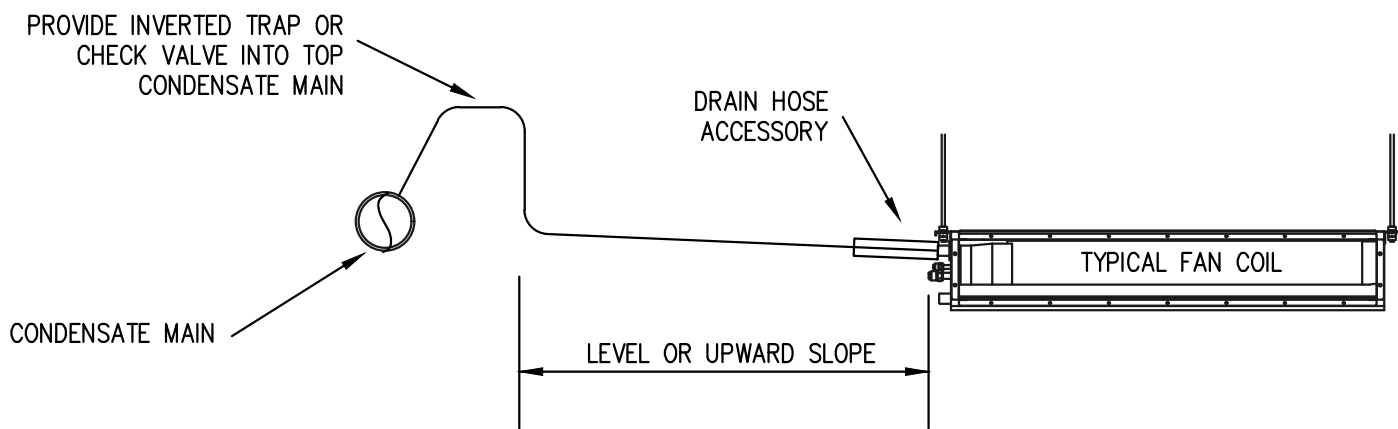
PLAN — EXPANSION LOOPS

NOT TO SCALE



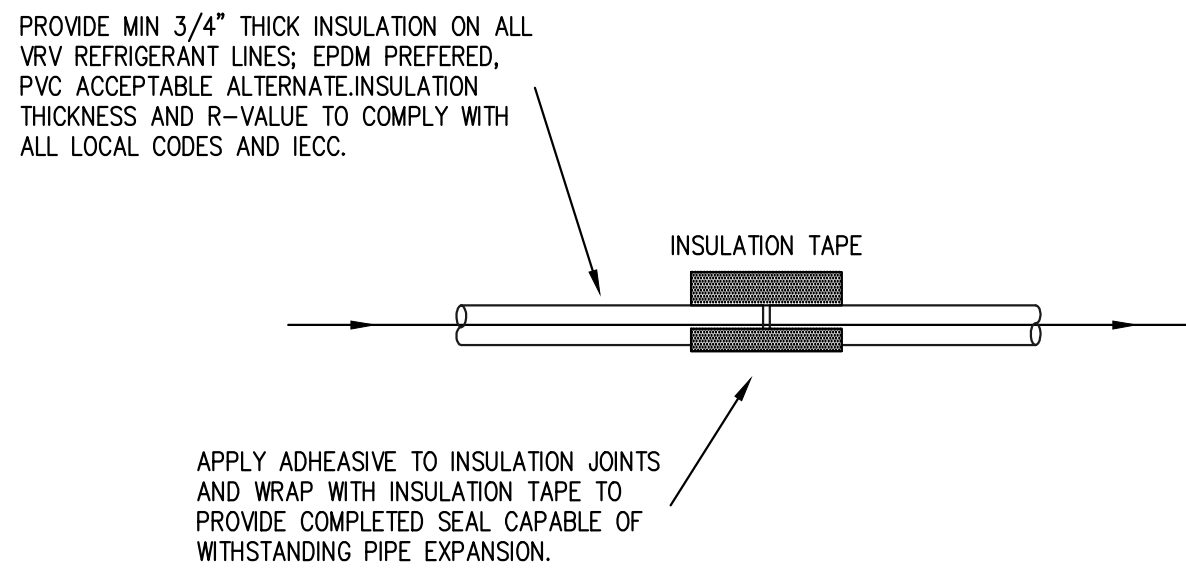
TYPICAL PIPE EXPANSION AND SUPPORT DETAIL

NOT TO SCALE



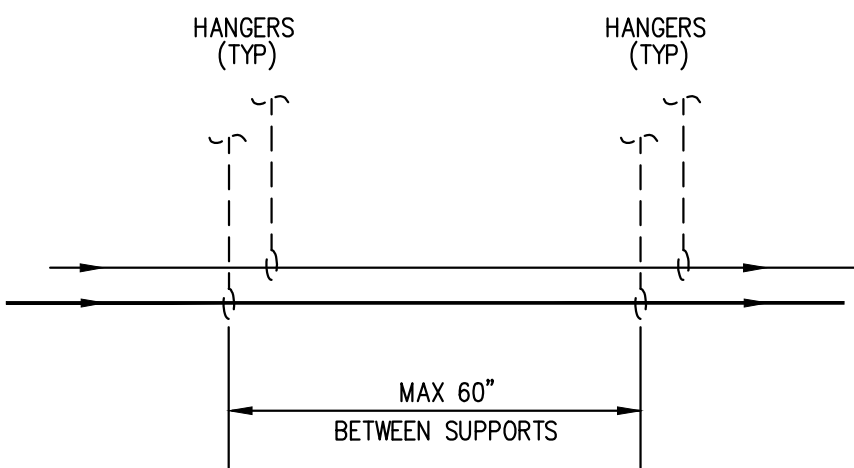
CONDENSATE DRAIN PIPING FOR INDOOR UNITS

NOT TO SCALE (REFER TO MANUFACTURERS INSTRUCTIONS)



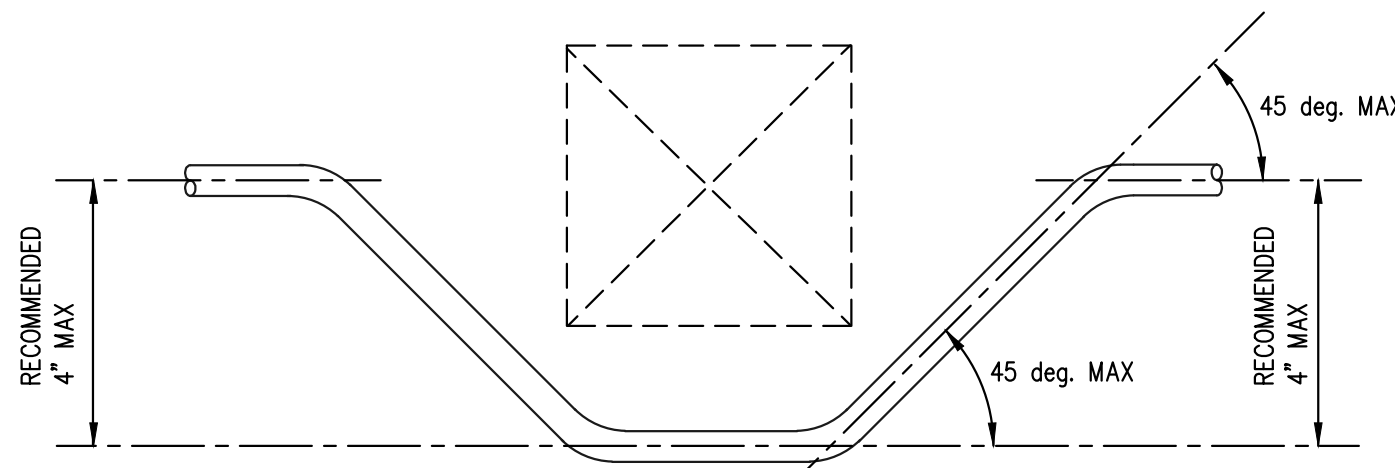
TYPICAL REFRIGERANT PIPING INSULATION DETAIL

NOT TO SCALE



TYPICAL HANGAR SPACING DETAIL

NOT TO SCALE
NOTES:
1. HANGAR TYPES TO INCLUDE CLEVIS HANGARS OR TRAPEZE HANGARS.



ELEVATION — PIPING OFFSET BELOW OBJECT

NOT TO SCALE

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BUILT FORM
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Chicago, IL 60642

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POOL CONSULTANT
TBD

ACOUSTICAL CONSULTANT
TBD

PROJECT
FAYETTEVILLE MIXED-USE DEVELOPMENT
500 Hay Street, Fayetteville, NC 28301

SHEET TITLE
MECHANICAL VRF SYSTEM
DETAILS

PROJECT NO.
DATE
M302

