

DIVISION 15 - MECHANICAL
SECTION 1500
MECHANICAL GENERAL PROVISIONS

A. GENERAL CONDITIONS

- DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFIC SECTIONS ARE A PART OF THIS CONTRACT AND APPLY TO THIS AND THE OTHER SECTIONS OF DIVISION 15.
- THE CONTRACTOR FOR THIS WORK IS REQUIRED TO READ THE ENTIRE SPECIFICATIONS AND REVIEW DRAWINGS FOR ALL OTHER TRADES.
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING HIS SUBCONTRACTORS WITH A FULL SET OF BID SET DOCUMENTS INCLUDING SPECIFICATIONS AND THE COORDINATION OF HIS WORK AND INSPECTIONS AND THE WORK AND INSPECTIONS OF HIS SUBCONTRACTORS WITH ALL OTHER TRADES ON SITE CONFORMING TO THE GENERAL CONTRACTOR'S TIME SCHEDULE.
- THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING HIS BID. DETERMINE CONDITIONS AFFECTING THE WORK. BIDS SHALL BE BASED ON THE BEST AVAILABLE INFORMATION OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR PERFORMANCE OF WORK.
- WHEN USED, THE TERM "PROVIDED BY CONTRACTOR" SHALL BE INTERPRETED AS MEANING "FURNISHED AND INSTALLED" WITH THE EXCEPTION WHERE ITEMS ARE "PROVIDED BY TENANT" WHICH MEANS "FURNISHED ONLY" (INSTALLED BY CONTRACTOR), EXCEPT AS SPECIFICALLY NOTED OTHERWISE.

B. GENERAL REQUIREMENTS

- THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE A COMPLETE AND FULLY FUNCTIONAL MECHANICAL SYSTEM AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS. ALL WORK NOT SPECIFICALLY NOTED AS BEING BY THE LANDLORD SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. CLOSELY COORDINATE THE INSTALLATION WITH THE LANDLORD, AS REQUIRED. FIELD VERIFY THE EXACT TYPE, SIZE AND LOCATION, ETC OF EXISTING PIPE AND DUCTS IN THE TENANT SPACE PRIOR TO BID.
- THE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER AND ANY MATERIAL OR LABOR CALLED FOR IN ONE SHALL BE PROVIDED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. ANY MATERIAL OR LABOR WHICH IS NEITHER SHOWN ON THE DRAWINGS NOR CALLED FOR IN THE SPECIFICATIONS, BUT WHICH IS OBVIOUSLY NECESSARY TO COMPLETE THE WORK, AND WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED BY THE CONTRACTOR.
- WHERE THE DRAWINGS OR SPECIFICATIONS CALL FOR ITEMS WHICH EXCEED CODES OR THE LANDLORD'S TENANT CRITERIA, THE CONTRACTOR IS STILL RESPONSIBLE FOR PROVIDING THE SYSTEM AS DESIGNED AND DESCRIBED ON THESE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.
- ALL MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING, AND REPAIRING. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT ACCESS TO ALL EQUIPMENT FOR SERVICE.
- THE CONTRACTOR SHALL DO ALL CUTTING, CORE DRILLING, CHASING OR CHANNELING AND PATCHING REQUIRED FOR ANY WORK UNDER THIS DIVISION. CUTTING SHALL BE PROVIDED BY THE TENANT'S CONSTRUCTION MANAGER AND THE LANDLORD. PATCHING SHALL MATCH FINISH OF SURROUNDING AREA.

C. CODES

- ALL WORK SHALL BE PERFORMED IN A NEAT PROFESSIONAL MANNER USING GOOD ENGINEERING PRACTICES. ALL WORK SHALL CONFORM TO THE LANDLORD'S CRITERIA, THE STATES, COUNTY'S, CITY'S AND LOCAL CODES AND ORDINANCES, SAFETY AND HEALTH CODES, ENERGY CODES, AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS. THE CONTRACTOR SHALL INQUIRE INTO AND COMPLY WITH ALL APPLICABLE CODES, ORDINANCES, AND REGULATIONS. AFTER CONTRACT IS ISSUED, NO ADDITIONAL COST OF SUCH ISSUES SHALL BE REIMBURSED BY THE TENANT TO THE CONTRACTOR.

D. LICENSES, PERMITS, INSPECTIONS & FEES

- THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS, APPROVALS AND FEES REQUIRED OR RELATED TO HIS WORK.
- FURNISH TO THE TENANT'S CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL. AT SUBSTANTIAL COMPLETION DATE OF DRAWINGS.

E. DRAWINGS

- DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. BECAUSE OF THE SMALL SCALE OF THE DRAWINGS, IT IS NOT POSSIBLE TO INDICATE ALL DUCT AND PIPING OFFSETS, FITTINGS AND ACCESSORIES THAT MAY BE REQUIRED.
- THE LAYOUT SHOWN ON THE DRAWINGS IS BASED ON A PARTICULAR MAKE OF EQUIPMENT. IF ANOTHER MAKE OF EQUIPMENT IS USED WHICH REQUIRES MODIFICATION OR CHANGE OF ANY DESCRIPTION FROM THE DRAWINGS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE AS PART OF THIS WORK, FOR MAKING ALL SUCH MODIFICATIONS AND CHANGES, INCLUDING THOSE INVOLVING OTHER TRADES WITH THE COST THEREOF INCLUDED IN HIS BID. IN SUCH CASE, CONTRACTOR SHALL SUBMIT DRAWINGS AND SPECIFICATIONS PRIOR TO STARTING WORK SHOWING ALL SUCH MODIFICATIONS AND CHANGES. HIS PROPOSAL SHALL BE SUBJECT TO THE APPROVAL OF THE TENANT'S CONSTRUCTION MANAGER.

F. EXISTING SLL SPACE CONDITIONS

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION OF EXISTING MECHANICAL WORK SHOWN ON THE MECHANICAL DRAWINGS AND THE MECHANICAL DEMOLITION SHOWN ON THE ARCHITECTURAL DRAWINGS.
- THE CONTRACTOR SHALL INCLUDE, AND WILL BE HELD RESPONSIBLE FOR, THE REMOVAL OF ALL EXISTING FIRE PROTECTION, PLUMBING FIXTURES, PIPING, HVAC UNITS, REFRIGERANT RECAPTURE, EXHAUST FANS, ETC AND ASSOCIATED ROOF CURBS NOT TO BE REUSED IN THIS PROJECT, UNLESS SPECIFICALLY NOTED OTHERWISE. CONTRACTOR MUST VERIFY WITH THE LANDLORD ALL PRESUMED ABANDONED EQUIPMENT, PIPES, DUCTWORK, AND EQUIPMENT PRIOR TO REMOVAL. ROOF CURBS SHALL BE REMOVED AND THE ROOF PATCHED UNLESS NOTED FOR REUSE OR RECONFIGURATION ON PLANS. ROOF PATCHING SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE BY A ROOFING CONTRACTOR APPROVED BY THE LANDLORD. ALL EXTRANEOUS ITEMS IN THE SPACE OR ON THE ROOF (REUSEABLE ITEMS) NOT APPLICABLE TO THE PROJECT OR THE LANDLORD'S OR ANOTHER TENANT'S ACTIVE SYSTEM MUST BE REMOVED AND ROOF/WALL/FLOOR PATCHED/REPAIRED TO MATCH EXISTING STRUCTURE. EXISTING ABANDONED PIPES, DUCTS, OR EQUIPMENT IN THE FLOOR, EMBEDDED IN CONCRETE, OR OTHERWISE INACCESSIBLE ARE TO BE CUT OFF AND SEALED BELOW OR WITHIN FLOOR OR WALL LEVEL WHEN THEY ARE NOT TO BE REUSED IN THIS PROJECT. IF REQUIRED BY LANDLORD OR CODES, ABANDONED PIPING AND OR DUCTWORK MUST BE REMOVED TO POINT OF ORIGIN, CONFORM THE EXTENT OF DEMOLITION PRIOR TO BID AND INCLUDE IN BID PROPOSAL.
- ACTIVE LANDLORD OR OTHER TENANT SERVICES ENCOUNTERED IN WORK SHALL BE PROTECTED AND SUPPORTED. IF EXISTING SERVICES NOT ANTICIPATED RELOCATION, CONTACT THE TENANT'S CONSTRUCTION MANAGER IMMEDIATELY. ALL COSTS FOR REPAIR OF DAMAGES TO ACTIVE LANDLORD OR OTHER TENANT SERVICES DURING CONSTRUCTION SHALL BE PAID FOR BY THE CONTRACTOR, INCLUDING THE DAMAGE.
- THE INS-AND MODIFICATIONS TO EXISTING LANDLORD SERVICES MUST BE DONE WITH MINIMUM INTERRUPTION OF LANDLORD OPERATION AND DURING HOURS SPECIFIED BY THE LANDLORD. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL WORKING HOURS OF HIS WORK WITH THE LANDLORD PRIOR TO SUBMITTING HIS BID. THE CONTRACTOR SHALL INCLUDE IN HIS BID, ALL PREMIUM TIME REQUIRED TO PERFORM MODIFICATIONS DURING OTHER THAN NORMAL WORKING HOURS. ALL SUCH WORK MUST BE COORDINATED WITH THE LANDLORD.

G. DISCREPANCIES IN DOCUMENTS

- DRAWINGS (PLANS, SPECIFICATIONS, AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. WHERE DRAWINGS, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT OR ARE UNCLEAR, ADVISE THE GENERAL CONTRACTOR IN WRITING, PRIOR TO SUBMITTAL OF BID. THE GENERAL CONTRACTOR IS RESPONSIBLE TO ADVISE THE TENANT'S CONSTRUCTION MANAGER, IN WRITING, OF VARIATIONS TO CONTRACT DOCUMENTS PRIOR TO SUBMISSION OF BID. OTHERWISE, TENANT'S CONSTRUCTION MANAGER'S INTERPRETATION OF CONTRACT DOCUMENTS OR CONDITIONS SHALL BE FINAL WITH NO ADDITIONAL COMPENSATION PERMITTED.

H. TRADE NAMES AND MANUFACTURERS

- WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM STANDARD OR MAKE BID. MANUFACTURERS CONSIDERED AS AN EQUAL OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO APPROVAL IN WRITING BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO ACCEPTANCE. THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S EXPENSE.

I. SHOP DRAWINGS

- SUBMIT SIX COPIES OF MATERIAL LISTS AND SHOP DRAWINGS FOR ALL EQUIPMENT AND DUCT FABRICATION DRAWINGS TO THE TENANT'S CONSTRUCTION MANAGER FOR APPROVAL PRIOR TO ORDERING EQUIPMENT. SUBMISSIONS MUST BE EARLY ENOUGH TO ALLOW THE TENANT'S CONSTRUCTION MANAGER SEVEN WORKING DAYS FOR REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BE IN ACCORDANCE WITH THE GENERAL CONDITIONS USING THE MANUFACTURER'S LISTS ON THE DRAWINGS. SHOP DRAWINGS SHALL INCLUDE ALL DATA THAT PERTAINS TO THE REQUIREMENTS SET FORTH ON THE DRAWINGS AND IN THE SPECIFICATIONS. THE SUBMITTAL SHALL INCLUDE BUT NOT LIMITED TO CUTS OR CATALOGS INCLUDING DESCRIPTIVE LITERATURE AND CHARACTERISTICS OF EQUIPMENT SHALL SHOW MATCH DIMENSIONS, ROUGHING-IN DATA, CAPACITY CURVES, PRESSURE DROP, CODE COMPLIANCE, MOTOR AND DRIVE DATA AND ELECTRICAL DATA. OBSERVE SPECIAL INSTRUCTIONS WHEN REQUIRED. SUBMITTALS SHALL BEAR THE STAMP OF THE GENERAL AND SUBCONTRACTOR SHOWING THAT HE HAS REVIEWED AND CONFIRMED THAT THEY ARE IN CONFORMANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS OR INDICATE WHERE EXCEPTIONS TAKE PLACE. LACK OF SUCH CONTRACTOR REVIEW AND APPROVAL WILL BE CAUSE FOR REJECTION WITHOUT REVIEW BY TENANT'S CONSTRUCTION MANAGER. ALL SHOP DRAWINGS MUST APPEAR IN THE OPERATION AND MAINTENANCE MANUALS LEFT ON SITE AT JOB COMPLETION.
- TENANT'S CONSTRUCTION MANAGER'S REVIEW OF SHOP DRAWINGS OR SCHEDULES SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR ERRORS, OMISSIONS OR OTHER DEFICIENCIES OR DEVIATIONS IN THE SHOP DRAWING FROM THE CONTRACT DRAWINGS AND SPECIFICATIONS.

J. RECORD DRAWINGS

- THE CONTRACTOR SHALL MAINTAIN ONE COPY OF DRAWINGS AND SPECIFICATIONS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS, SUCH AS:
 - LOCATION OF CONCEALED PIPING VALVES AND DUCTS
 - REVISIONS, ADDENDUMS, AND CHANGE ORDERS
 - SIGNIFICANT DEVIATIONS MADE NECESSARY BY FIELD CONDITIONS, PROVIDE EQUIPMENT SUBSTITUTIONS, AND CONTRACTOR'S COORDINATION WITH OTHER TRADES
 - EXACT ROUTING OF ALL SANITARY AND DOMESTIC WATER PIPING UNDER FLOOR.
- AT COMPLETION OF THE PROJECT AND BEFORE FINAL APPROVAL, THE CONTRACTOR SHALL MAKE ANY FINAL CORRECTIONS TO DRAWINGS AND CERTIFY THE ACCURACY OF EACH PRINT BY SIGNATURE THEREON. THE DRAWINGS ARE TO BE TURNED OVER TO TENANT.

K. GUARANTEE

- THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORK UNDER HIS CONTRACT AND SHALL MAKE GOOD, REPAIR OR REPLACE AT HIS OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL, OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF 12 MONTHS FROM THE DATE OF ACCEPTANCE IN WRITING OF THE INSTALLATION BY THE TENANT'S CONSTRUCTION MANAGER. PROVIDE EXTENDED WARRANTIES AS SPECIFIED WITH INDIVIDUAL EQUIPMENT. IN CASE OF REPLACEMENT OR REPAIR OR EQUIPMENT DUE TO FAILURE WITHIN GUARANTEE PERIOD, GUARANTEE ON THAT PORTION OF WORK SHALL BE EXTENDED FOR A PERIOD OF ONE (1) YEAR FROM DATE OF SUCH REPLACEMENT OR REPAIR.

L. OPERATIONS MANUALS

- ONE COPY OF EACH OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT FURNISHED ON JOB SHALL BE COLLECTED AND INSERTED IN A 3" THREE RING BINDER AND TURNED OVER TO THE TENANT. EACH NOTEBOOK SHALL INCLUDE BUT NOT BE LIMITED TO INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS, PARAMETERS OR BROCHURES APPROVED SHOP DRAWINGS AND WARRANTIES OBTAINED FROM EACH MANUFACTURER OF PRINCIPAL ITEMS OF EQUIPMENT.

M. SLEEVES

- THE CONTRACTOR SHALL PROVIDE SLEEVES TO PROTECT EQUIPMENT OR FACILITIES IN THE INSTALLATION. EACH SLEEVE SHALL EXTEND THROUGH ITS RESPECTIVE FLOOR, WALL OR PARTITION AND SHALL BE CUT FLUSH WITH EACH SURFACE EXCEPT THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2" ABOVE THE FLOOR.
- ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS AND/OR FLOORS SHALL BE FIRE SEALED WITH CALCIUM SILICATE, SUEXION, "ROY" GOMM, "ROY" FIRE RATED SEALANTS OR EQUAL, SO AS TO RETAIN THE FIRE RATING OF THE FLOOR OR WALL CONFORM TO U. L. ASSEMBLY RATING OF FLOOR OR WALL.
- SLEEVES IN BEARING AND MASONRY WALLS, FLOORS, AND PARTITIONS SHALL BE STANDARD WEIGHT STEEL PIPE FINISHED WITH SMOOTH EDGES. FOR OTHER THAN MASONRY PARTITIONS, THROUGH SUSPENDED CEILING, OR FOR CONCRETE VERTICAL PIPING, SLEEVES SHALL BE NO. 25 U.S.G. GALVANIZED MINIMUM.
- DUCT SLEEVES TO BE MINIMUM 14 GAUGE STEEL.

N. HANGERS

- HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON, BANDS, C-CLAMPS WITH RETAINING CLIPS CHANGERS, HANGER RODS, ETC., NECESSARY FOR THE INSTALLATION OF WORK.
- HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE, OR MASONRY, BUT NOT TO PIPING OR DUCTWORK. HANGING FROM METAL DECK IS NOT PERMITTED. HANGERS MUST BE ATTACHED TO UPPER SURFACE OF BAL JOIST. WHERE INTERFERENCES OCCUR, IN ORDER TO SUPPORT DUCTWORK OR PIPING, THE CONTRACTOR MUST INSTALL TRAPEZOID TYPE HANGERS OR SUPPORTS WHICH SHALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO DAMPERS, VALVES, ACCESS DOORS, AND OTHER EQUIPMENT SERVICE REQUIREMENTS AND/OR OTHER TRADES. HANGER TYPES AND INSTALLATION METHODS ARE SUBJECT TO LANDLORD'S APPROVAL.
- HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTSIDE DIAMETER OF INSULATION. INSTALL 6" LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN THE HANGER AND THE PIPE INSULATIONS.
- HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DIE-ELECTRICALLY SEPARATED FROM ONE ANOTHER.

O. ACCESS DOORS

- FURNISH STEEL ACCESS DOORS AND FRAMES, MIN. 18"x24" OR AS SHOWN ON DRAWINGS, TO GENERAL CONTRACTOR FOR ALL LOCATIONS WHERE NECESSARY TO PROVIDE ACCESS TO CONCEALED VALVES, AND OTHER EQUIPMENT EQUIPMENT OR INSPECTION. LOCATION, TYPE, SIZE AND NUMBER AS DETERMINED BY CONTRACTOR AND APPROVED BY TENANT CONSTRUCTION MANAGER. LIST EQUIPMENT REQUIREMENTS. GENERAL CONTRACTOR SHALL MEET ALL REQUIREMENTS AS DEFINED IN THE ELECTRICAL DIVISION OF THE SPECIFICATIONS.
- ACCESS DOORS LOCATED IN FIRE RATED WALLS, FLOORS, CEILING FLOOR OR CEILING ROOF ASSEMBLIES SHALL BE FIRE RATED, UNDERWRITER'S LABORATORIES, INC., LISTED AND LABELED.
- ACCESS DOORS SHALL BE FLUSH TYPE, MANUFACTURED FROM NO. 14 GAUGE STEEL, COMPLETE WITH FLUSH FLANGE TYPE FRAMES MANUFACTURED FROM NO. 16 GAUGE STEEL PROVIDED WITH ANCHORS. ACCESS DOORS SHALL BE SUITABLE FOR INSTALLATION IN WALL OR CEILING MATERIALS SHOWN IN ROOM FINISH SCHEDULES.

P. ELECTRICAL MOTORS

- FURNISH, INSTALL AND ALIGN ALL MOTORS REQUIRED FOR THIS EQUIPMENT. UNLESS THEY ARE FACTORY INSTALLED ON THE UNIT, ALL STARTERS AND ASSOCIATED WIRING AND SAFETY SWITCHES FOR SUCH MOTORS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. STARTERS SHALL MEET ALL REQUIREMENTS AS DEFINED IN THE ELECTRICAL DIVISION OF THE SPECIFICATIONS.
- DESIGN, CONSTRUCTION AND PERFORMANCE CHARACTERISTICS OF MOTORS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF LATEST NEMA AND IEEE STANDARDS FOR ELECTRICAL EQUIPMENT. ALL MOTORS SHALL BE SUITABLE FOR OPERATION ON VOLTAGE VARIATION OF PLUS OR MINUS 10%, 40 DEGREES AMBIENT TEMPERATURE, HAVE A SERVICE FACTOR OF NOT LESS THAN 1.15.
- LOW VOLTAGE (24 VOLT) WIRING
 - THE CONTRACTOR IS TO INSTALL ALL LOW VOLTAGE WIRING REQUIRED FOR HIS EQUIPMENT. THIS WORK INCLUDES ALL TRANSFORMERS AND DEVICES TO MAKE THIS A COMPLETE FUNCTIONAL SYSTEM.
 - ALL WORK TO CONFORM TO THE LATEST ADDITION N.E.C. AND TO DIVISION 16 ELECTRICAL SPECIFICATIONS.
 - ANY CONDUIT REQUIRED BY CODE ON THE LANDLORD WILL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.

DIVISION 15 - MECHANICAL SECTION 1500 HEATING, VENTILATION, AND AIR CONDITIONING

A. SCOPE OF WORK

- THE HVAC CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION AND FACILITIES NECESSARY FOR REASONABLY FORESEEN AND INCIDENTAL TO THE FURNISHING, INSTALLATION, COMPLETION AND TESTING OF ALL THE WORK FOR THE MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS, CALLED FOR IN THE SPECIFICATIONS, AND AS REQUIRED BY JOB CONDITIONS, TO INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING: (REFER TO RESPONSIBILITY SCHEDULE FOR DUCT RESPONSIBILITIES)
 - HVAC UNITS, EQUIPMENT, AND APPURTENANCES.
 - DUCTWORK, FITTINGS, DAMPERS, AND INSULATION.
 - HYDRONIC PIPING AND INSULATION (AS APPLICABLE REFER TO PLANS).
 - REFRIGERANT PIPING AS APPLICABLE (REFER TO PLANS).
 - GRILLES, GRILLS, OR REGISTERS.
 - CURBS AND STEEL FRAMING FOR SUPPORT (AS APPLICABLE, REFER TO PLANS).
 - TESTING, ADJUSTING, AND BALANCING.
 - OPERATIONS MANUALS.
 - TEMPERATURE CONTROLS AND RELATED DIAGRAMS.
 - SEQUENCES OF OPERATION.
 - CONNECTION TO ANY LANDLORD ENERGY MANAGEMENT SYSTEM.

B. BEFORE STARTING WORK

- THE CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO DETERMINE COORDINATE AND INTEGRATE THE VARIOUS ELEMENTS OF THE HVAC SYSTEM, MATERIALS, AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCES AND CONFRONTATIONS.

HVAC EQUIPMENT

- PRIMAIR HEATING, VENTILATION AND AIR CONDITIONING UNITS
 - PRIMAIR HEATING, VENTILATION, AND AIR CONDITIONING UNITS ARE TO BE AS SCHEDULED. ALL COMPRESSORS ARE TO INCLUDE AS - YEAR EXTENDED WARRANTY.
 - EQUALS EQUIPMENT AS MANUFACTURED BY CARRIER, TRANE OR YORKS ACCEPTABLE.
 - ALL EQUIPMENT SHALL BE COMPLETE IN EVERY RESPECT WITH ALL DEVICES, APPURTENANCES, AND ACCESSORIES PROVIDED TO MEET THE DESIGN INTENT AND OPERATION OF THE SYSTEMS SHOWN ON THE DRAWINGS AND SPECIFIED HEREIN.
- EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. ALL AIR CONDITIONING EQUIPMENT MUST HAVE A CONDENSATE DRAIN AND BE TRAPPED IN ACCORDANCE WITH MANUFACTURERS DATA. SEE DRAWINGS FOR ADDITIONAL DETAILS.
- SECONDARY DRAIN PANS ARE REQUIRED TO BE INSTALLED BENEATH ALL INDOOR AIR CONDITIONING EQUIPMENT WITH THE EXCEPTION OF VAV BOXES. SECONDARY DRAIN PANS ARE TO PROTECT ENTIRE UNIT. PROVIDE CONDENSATE PUMPS, AS REQUIRED. CONDENSATE SHALL BE DIRECTED TO POT-HOLE OR AS SPECIFIED ON PLANS.
- TOLLET EXHAUST FANS
 - WHERE SHOWN ON DRAWINGS, PROVIDE A TOLLET EXHAUST FAN UNIT COMPLETE WITH GRAVITY BACK DRAFT DAMPERS. ALL DUCTWORK, ROOF OPENINGS AND CAPS NECESSARY TO PROVIDE A COMPLETE EXHAUST SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR. REFER TO PLANS FOR APPLICABILITY.
- BASEBOARD, CABINET, AND UNIT HEATERS
 - WHERE SHOWN ON DRAWINGS, PROVIDE ELECTRIC HEATERS COMPLETE WITH ELECTRIC HEATING COIL, CONTROLS, AND INTERNAL THERMOSTAT.

VIBRATION ISOLATION DEVICES

- VIBRATION ISOLATION DEVICES SHALL BE PROVIDED IN ALL SUPPORTS BETWEEN VIBRATING EQUIPMENT (FANS, ROOFTOP UNITS, AIR HANDLERS, FAN POWERED VAN BOXES, ETC.) AND STRUCTURE.
- VIBRATING EQUIPMENT HUNG FROM STRUCTURE SHALL BE ISOLATED WITH RUBBER AND SPRING DEVICES. VIBRATING EQUIPMENT SUPPORTS FROM FLOOR OR DECK SHALL BE ISOLATED WITH HOUSING SPRING MOUNT DEVICES.
- EXAMINE DEAD LOAD AND OPERATING LOAD CONDITIONS WHEN SELECTING DEVICES. ADJUST FOR PROPER ALIGNMENT AND LOADS. AND "GROUNDING" THE ISOLATOR.
- CHECK HANGER RODS FOR ALLOWABLE LOADS AT THE ISOLATING DEVICE AND AT THE UPPER AND LOWER ATTACHMENTS TO STRUCTURES, DUCTS, EQUIPMENT, ETC.
- CONSULT MANUFACTURER FOR APPLICATION DATA.

CURBS AND STEEL FRAMING FOR SUPPORT

- THIS CONTRACTOR WILL PROVIDE ALL NECESSARY CURBS AND STEEL FRAMING REQUIRED TO INSTALL ALL HVAC EQUIPMENT AS DESCRIBED OR IMPLIED ON THE DRAWINGS. CURBS SHALL BE A MINIMUM OF 4" HIGH OF THE SAME MANUFACTURER OF THE EQUIPMENT SUPPORTED. INSULATE UNDER THE COMPRESSOR SECTION TO PREVENT CONDENSATION. ALL CURBS MUST BE INSTALLED SO THAT TOP OF CURBS ARE "DECK" ALL PENETRATIONS OF EXISTING STRUCTURE SHALL BE DONE IN ACCORDANCE TO THE LANDLORD'S GUIDELINES AT THIS CONTRACTOR'S EXPENSE.

METAL DUCTWORK - NO FIBERGLASS DUCT ALLOWED

- NO DUCTWORK SHALL BE FABRICATED PRIOR TO APPROVAL BY THE TENANT'S CONSTRUCTION MANAGER. SIGNIFICANT PORTIONS FROM DESIGN MUST BE APPROVED BY TENANT'S CONSTRUCTION MANAGER PRIOR TO FABRICATION OR INSTALLATION. ALL DUCT MAINS ARE TO BE RECTANGULAR UNLESS NOTES OTHERWISE. ALL DUCT BRANCHES TO DIFFUSERS ARE TO BE ROUND RIGID DUCT. FLEXIBLE DUCT CONNECTIONS TO THE DIFFUSER ARE NOT ALLOWED ON THE SALES FLOOR.
- EXCEPT AS OTHERWISE INDICATED, FABRICATE AND INSTALL RECTANGULAR DUCTS WITH GALVANIZED SHEET STEEL IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" OF THE LATEST EDITION. CONFORM TO THE REQUIREMENTS OF THE REFERENCES STANDARDS FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS, THE ROD APPLICATIONS, AND JOINT TYPES AND INTERVALS.
- EXCEPT WHERE OTHERWISE INDICATED, CONSTRUCT DUCT SYSTEMS TO THE FOLLOWING PRESSURE CLASSIFICATIONS: (VERIFY WHETHER RETURN OR EXHAUST DUCT IS POSITIVE OR NEGATIVE PRESSURE).
 - SUPPLY DUCTS: 2 INCHES WATER GAUGE POSITIVE PRESSURE.
 - RETURN AND EXHAUST DUCTS: 2 INCHES WATER GAUGE, NEGATIVE PRESSURE. PRESSURE TEST DUCTS FOR LEAKAGE. REMOVE LEAKING UNITS AND APPLY SEALANTS AS REQUIRED TO FABRICATE A SYSTEM THAT DOES NOT EXCEED 5% LEAKAGE OR LESS AS STATED BY PRESSURE CLASS RATINGS IN SMACNA STANDARDS.
- AS A MINIMUM, CROSSBRACE ALL FLAT SURFACES OR REINFORCE WITH A BEAM APPROXIMATELY 3/8" WIDE X 3/16" DEEP ON 12" CENTERS TO PREVENT VIBRATIONS.
- INSTALL DOUBLE THICKNESS TURNING VANES IN ALL RIGHT ANGLE ELBOWS.
- INSTALL HGGD ROUND AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMACNA STANDARDS. SUPPORT HORIZONTAL DUCTS WITHIN 2 FEET OF EACH END AND WITHIN 4 FEET OF EACH BRANCH INTERSECTION. JOINTS SHOULD STRAP HANDLES ON JOINTS OF FITTING. SUPPORT VERTICAL DUCTS AT A MAXIMUM INTERVAL OF 16 FEET AND AT EACH FLOOR. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS. PROVIDE SHAD AND ISOSM BRACING AS REQUIRED BY STATE AND LOCAL CODES OR BY LANDLORD.
- WHERE DUCTS PASS THROUGH ROOFS AND FLOORS, PROVIDE AS MINIMUM 1-1/2"x1-1/2" x 2" x 1/8" STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANNULAR SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CAULKED WITH SILICONE SEALANT OR FIREPROOFED AS REQUIRED BY ASSEMBLY FIRE RATINGS.
- ALL TRAVELER JOINTS AND SEAMS IN SUPPLY AIR SHALL BE SEALED AIR TIGHT WITH DAP CMC DUCT SEALER. JOINTS ALSO SHALL BE RIVETED OR CONNECTED WITH SHEET METAL SCREWS.
- SOFT ELASTOMER BUTYL GASKET WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS.
- DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE.

- PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, CONTROLS, AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. IF THE ACCESS PANEL LOCATION IS EXPOSED TO THE SALES AREA, IT MUST BE APPROVED BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION. IN SUPPLY NO RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH PLASTER FRAMES MAY BE USED AS ACCESS LOCATIONS.

FLEXIBLE CONNECTIONS

- FLEXIBLE COLLARS SHALL BE PROVIDED AT ALL CONNECTIONS BETWEEN VIBRATING EQUIPMENT (FANS, ROOFTOP UNITS, ROOFTOP UNITS, AIR HANDLERS, FAN POWERED VAN BOXES, ETC.) AND DUCTS OR CASINGS. ALSO, PROVIDE FLEXIBLE CONNECTIONS WHERE DUCTS CROSS BUILDING EXPANSION JOINTS.
- FLEXIBLE CONNECTIONS SHALL CONSIST OF NEOPRENE-COATED FLAMEPROOF ADEQUATE JOINT FLEXIBILITY TO ALLOW FOR MOVEMENT AND PREVENT THE TRANSMISSION OF VIBRATION.
- THE FLEXIBLE CONNECTION IS TO BE RATED FOR THE OPERATING PRESSURE OF THE SYSTEM.

FIRE DAMPERS

- PROVIDE PRIMARY FIRE DAMPERS WHEN INDICATED OR REQUIRED BY CODES DAMPERS SHALL BE DESIGNED FOR HORIZONTAL OR VERTICAL FLOW OF AIR AS REQUIRED. FIRE DAMPERS SHALL BE UL LABELED.
- FIRE DAMPERS SHALL HAVE THE BLADES OUT OF THE AIRSTREAM AND A 450°F FUSIBLE LINK. TYPE A, AS MINIMUM.
- PROVIDE ALL NECESSARY FRAMING AND SLEEVES FOR DAMPER MOUNTING PER UL AND CODE REQUIREMENTS.
- PROVIDE DUCT ACCESS DOORS IN AN ACCESSIBLE LOCATION FOR ALL FIRE DAMPERS. DOOR IS TO BE 20 GA GALVANIZED DOOR WITH QUICK-OPENING LATCH AND
- FLEXIBLE AIR DUCT SHALL BE 1" INSULATED GLASS I AND RATED FOR THE OPERATING PRESSURE OF THE SYSTEM. DUCT CONSTRUCTION MATERIAL (PLASTIC, CLOTH ALUMINUM MUST ADHERE TO LOCAL CODES AND LANDLORD'S REQUIREMENTS AND BE INCLUDED AS SUCH IN THE BID.
- FLEXIBLE AIR DUCT MAY ONLY BE USED IN VERTICAL APPLICATIONS WITH PRIOR APPROVAL FROM TENANTS CONSTRUCTION MANAGER.
- FLEXIBLE DUCT SHALL NOT EXTEND OVER 5' 0" IN LENGTH AT ANY ONE LOCATION.
- SUPPLY AIR TAKE-OFF FITTINGS
- PROVIDE CONICAL OR "TELL-MOUTH" TAKE-OFFS FROM MAIN DUCTWORK TO ROUND BRANCHES. INSTALL PER MANUFACTURER'S INSTRUCTION.
- PROVIDE 45° RECTANGULAR TAKE-OFFS FROM MAIN DUCTWORK TO RECTANGULAR BRANCHES.

DAMPERS

- PROVIDE MANUAL LOCKING QUADRANT VOLUME CONTROL DAMPERS WITH HANDLE OPERATORS. IN EACH BRANCH DUCT AND AS SHOWN ON PLANS FACILITATE AIR BALANCING.
- WHERE ACCESS TO BALANCING DAMPERS IS RESTRICTED, YOUNG'S REGULATORS SHALL BE USED.
- ALL RECTANGULAR DAMPERS OUTSIDE AIR, REEF AIR, OR REEF AIR DUCTS ARE TO BE OF OPPOSED BLADE TYPE. ALL OUTSIDE AIR DUCT DAMPERS MUST ALSO BE OF THE LOW LEAKAGE TYPE.
- DAMPERS, MOTORIZED DAMPERS NOT FURNISHED WITH EQUIPMENT ARE TO BE HONEYWELL DAMPERS.

DIFFUSERS, GRILLES, AND REGISTERS

- PROVIDE DIFFUSERS GRILLES AND REGISTERS AS SCHEDULED. DEVICES TO BE COMPLETE WITH DAMPERS FRAMES AND ALL ACCESSORIES. FINISH AS INDICATED.
- INSTALL ALL AIR DEVICES AS LOCATED ON THE ARCHITECTURAL REFLECTED CEILING PLAN.
- APPROVED MANUFACTURERS, TITUS IS SPECIFIED, EQUALS BY METALAIR OR KRUEGER IS ACCEPTABLE.

MEDIUM PRESSURE DUCT

- WHERE DUCTWORK IS SPECIFICALLY NOTED AS MEDIUM PRESSURE, IT SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA STANDARDS FOR A PRE SURE RATING OF 3 INCHES WATER COLUMN MINIMUM OR LARGER AS REQUIRED BY LANDLORD.
- ALL GAUGES AND REINFORCEMENT MUST MEET WITH THE LATEST EDITION OF SMACNA STANDARDS FOR MEDIUM PRESSURE DUCT AND WITH THE LANDLORD'S DATA.
- ALL OTHER ITEMS FROM METAL DUCTWORK SECTION APPLY TO THIS SECTION.

DUCTWORK INSULATION

- INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURERS WRITTEN INSTRUCTIONS, AND IN ACCORDANCE WITH RECOGNIZED ENGINEERING PRACTICES. INSULATION MUST COMPLY WITH ALL NFPA 90A.
- ALL ROUND, RECTANGULAR AND SQUARE AIR DUCTWORK THAT IS NOT EXPOSED SHALL BE EXTERNALLY INSULATED WITH A MINIMUM OF 1" THICK 1-1/2" R INSULATION. INSULATION SHALL BE APPLIED TO ALL EXPOSED SURFACES. VAPOR BARRIERS IS TO BE MAINTAINED THROUGHOUT DUCT SYSTEM. ALL JOINTS MUST BE TAPED SO THAT NO INSULATION FIBER IS VISIBLE. EXPOSED DUCTWORK INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS, AND SMALL PENETRATIONS.
- ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NO HIGHER THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM C-411, AS REQUIRED BY LOCAL CODES.

SYSTEM CLEANUP

- DUCTWORK AND AIR HANDLING EQUIPMENT IS TO BE CLEANED OUT AND BLOWN OUT BEFORE PAINTING IS STARTED BY THE GENERAL CONTRACTOR.
- THE SPLIT IN UNITS AT ANY TIME FANS ARE OPERATED.

GREASE EXHAUST CLEANOUT

- GREASE DUCT CONSTRUCTION AND INSTALLATION SHALL BE IN ACCORDANCE WITH CHAPTER 5 2016 CMC.
 - CMC 504 LISTED GREASE DUCTS.
 - LISTED GREASE DUCT SHALL BE INSTALLED IN ACCORDANCE WITH THE TERMS OF THE LISTING AND THE MANUFACTURER'S INSTRUCTIONS.
- CMC 510: OTHER GREASE DUCTS
 - OTHER GREASE DUCTS SHALL COMPLY WITH THE REQUIREMENTS OF THIS SECTION.
- MATERIALS (510.5.1) DUCTS SHALL BE CONSTRUCTED OF AND SUPPORTED BY CARBON STEEL NOT LESS THAN 0.054 INCH (1.37MM) NO. 30 MSG IN THICKNESS OR STAINLESS STEEL NOT LESS THAN 0.043 INCH (1.09MM) NO. 18 MSG IN THICKNESS.
- INSTALLATION (510.5.2)
 - ALL SEAMS, JOINTS, PENETRATIONS, AND DUCT-TO-COLLAR CONNECTIONS SHALL HAVE A LIQUID-TIGHT CONTINUOUS EXTERNAL WEAL.

EXCEPTIONS

- DUCT-TO-HOOD COLLAR CONNECTIONS AS SHOWN IN FIGURE 5-2 (2016 CMC) SHALL BE PERMITTED.
- PENETRATIONS SHALL BE PERMITTED TO BE SEALED BY OTHER LISTED DEVICES THAT ARE TESTED TO BE GREASE-TIGHT AND ARE EVALUATED UNDER THE SAME CONDITIONS OF FIRE SEVERITY AS THE HOOD OR ENCLOSURE OF LISTED EXTRACTORS AND WHOSE PRESSURE DOSE NOT DETRACT FROM THE HOOD'S OR DUCT'S STRUCTURAL INTEGRITY.
- INTERNAL WELDING SHALL BE PERMITTED, PROVIDED THE JOINT IS FORMED OR GROUND SMOOTH AND IS READILY ACCESSIBLE FOR INSPECTION.

WELDED DUCT CONNECTION DUCT-TO-DUCT CONNECTION SHALL BE AS FOLLOWS:

- (1) TELESCOPING JOINT, AS SHOWN IN FIGURE 510.521 (1) (CMC 2016)
- (2) BELL-TYPE JOINT, AS SHOWN IN FIGURE 510.521 (2) (CMC 2016)
- (3) FLANGE WITH EDGE WELD, AS SHOWN IN FIGURE 510.521 (3)
- (4) FLANGE WITH FILLED WELD, AS SHOWN IN FIGURE 510.521 (4) (CMC 2016) (NFPA 96: 7.5.5.1)
- (5) 510.5.2.2 BUTT WELDED CONNECTIONS, BUTT WELDED CONNECTIONS SHALL NOT BE PERMITTED. (NFPA 96: 7.5.5.1)
- (6) 510.5.2.3 INSIDE DUCT SECTION, FOR TELESCOPING AND BELL-TYPE CONNECTIONS, THE INSIDE DUCT SECTION SHALL BE UPHILL OF THE OUTSIDE DUCT SECTION. (NFPA 96: 7.5.5.2)

GENERAL INSTALLATION

- INSTALL WATER MAINS WITHOUT FITCH. USE ECCENTRIC REDUCING COUPLINGS AT CHANGES IN SIZE WITH THE TOP OF PIPES AT SAME ELEVATION. MAKE CHANGES IN DIRECTION WITH FITTINGS.
- BRANCHES TO UNITS BELOW MAINS TO BE TAKEN FROM BOTTOM OF MAINS AT A 45 DEGREE ANGLE PITCH DOWNWARD TOWARD UNITS. BRANCHES TO UNITS ABOVE MAINS TO BE TAKEN FROM TOP OF MAINS AT A 45 DEGREE ANGLE PITCH UPWARD TOWARDS PITCH NOT LESS THAN 1" TO 30 FEET.
- HANGERS SHALL BE SIZED AND INSTALLED FOR THE OUTSIDE DIAMETER OF THE INSULATED PIPE. INSTALL 6" LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN THE HANGER AND PIPE INSULATION.
- HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DIE-ELECTRICALLY SEPARATED FROM ONE ANOTHER.
- SEE PLANS FOR APPLICABLE DETAILS.
- ALL PRESSURE PIPING SYSTEMS INSTALLED SHALL CONFORM TO THE REQUIREMENTS OF THE STATE PIPING AND WELDING CODES. INSTALL VALVES AT LOW POINTS FOR DRAINING EACH SYSTEM AND INSTALL MANUAL VENTS AT ALL HIGH POINTS OF EQUIPMENT AND PIPING IN THE SYSTEM TO PROPERLY REMOVE ENTAPPED AIR.

INSULATION

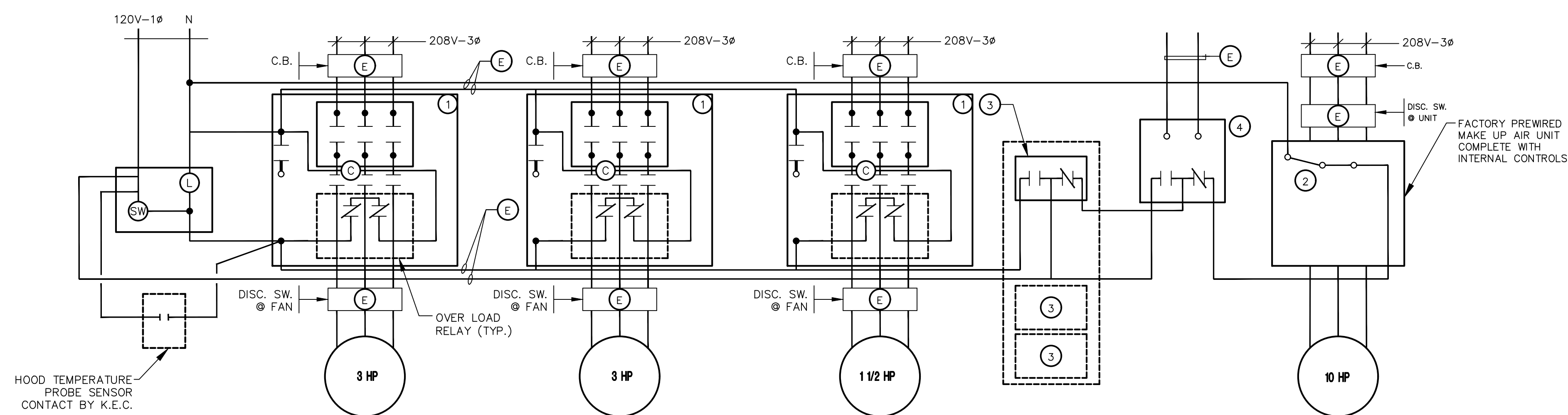
- ALL HYDRONIC PIPING FOR CHILLED WATER AND/OR HEATING WATER, VALVES, FITTINGS, AND ACCESSORIES SHALL BE INSULATED. ROOF PIPES UP TO 2 INCHES, INSULATE WITH 1 INCH THICK (R=2.3) @ 75°F FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BARRIER. ROOF PIPES 2.5-12 INCHES AND LARGER, INSULATE WITH 1-1/2 INCH THICK (R=3.2) @ 75°F FIBERGLASS INSULATION WITH ALL SERVICE JACKET AND VAPOR BAR.
- INSULATION AT ALL HANGERS FOR PIPING 2-1/2 INCHES AND LARGER SHALL BE HARD AND NON-COMPRESSIBLE.
- ALL INSULATION SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING OF NO HIGHER THAN 50 TO CONFORM WITH THE REQUIREMENTS OF THE NFPA.

REFRIGERANT PIPING

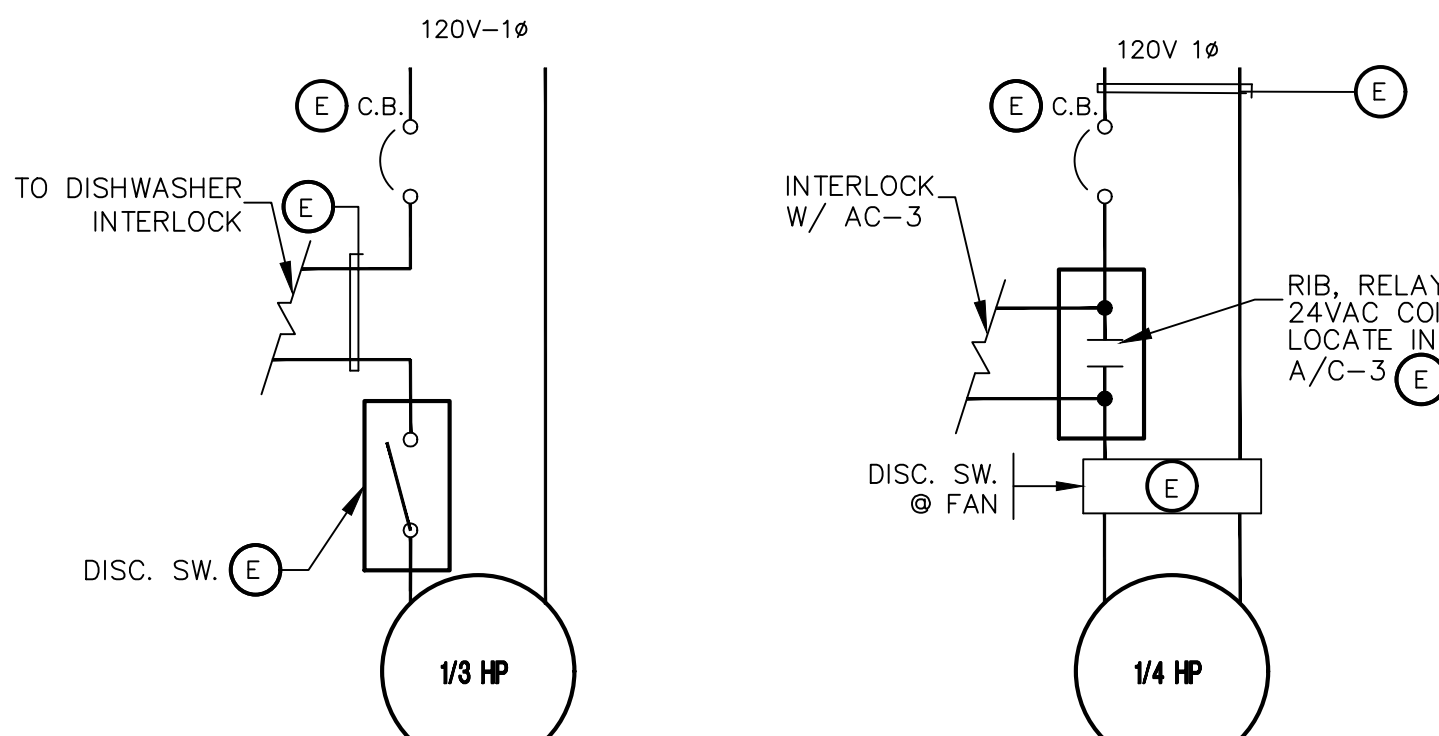
- PROVIDE A COMPLETE REFRIGERANT PIPING SYSTEM BETWEEN INDOOR FAN UNITS OUTDOOR CONDENSING UNITS, IF A APPLICABLE. PROVIDE RUL REFRIGERANT CHARGE AND TEST SYSTEM. REFER TO PLANS TO DETERMINE IF A REFRIGERANT PIPING SYSTEM IS REQUIRED.

MATERIALS

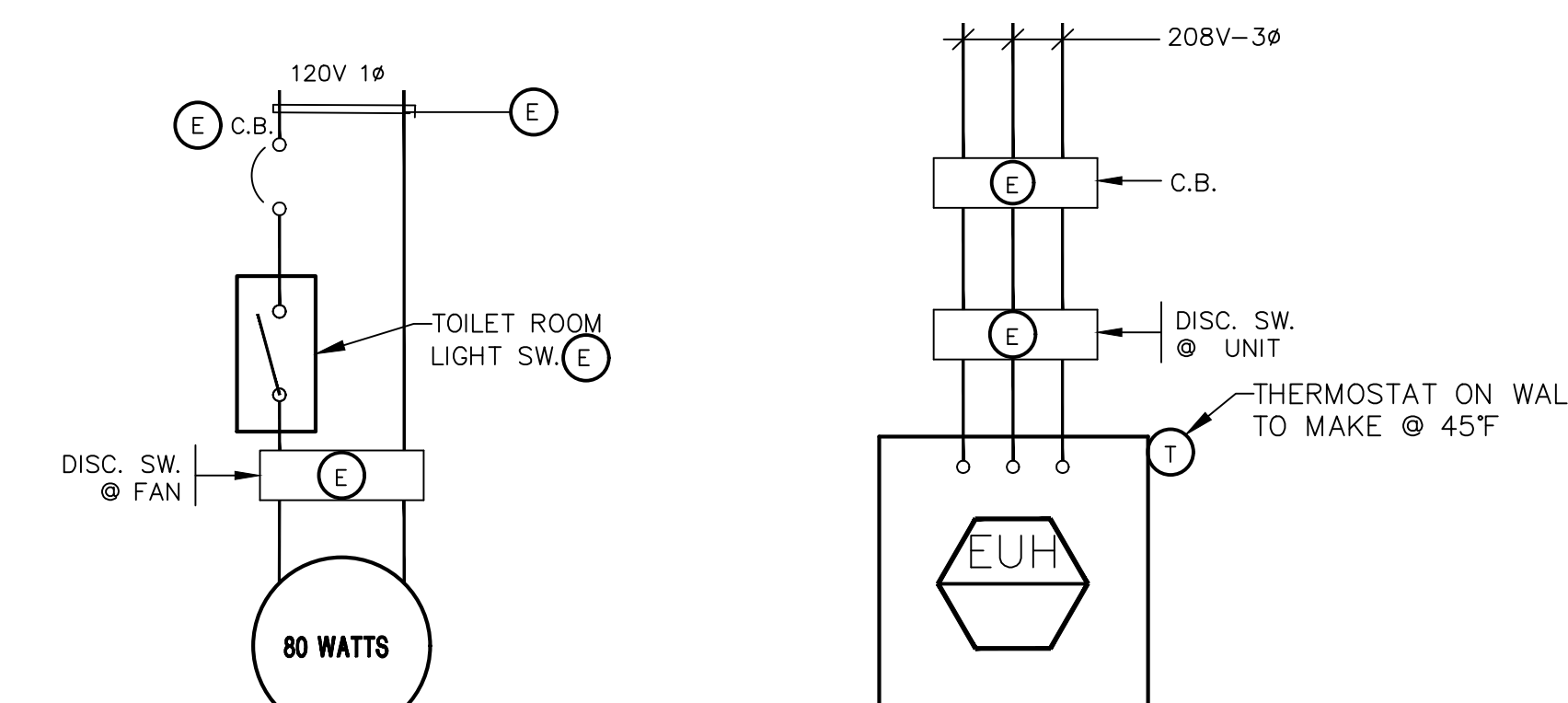
- REFRIGERANT PIPING SHALL BE TYPE "L" DRAWN COPPER TUBING (ASTM88), WROUGHT COPPER OR CAST BRONZE FITTINGS (ANSI B16.22), WITH SFLDS-5 SOLDERED.
- SERVICE VALVES, CHARGING PORTS, FILTER



EXH. FAN EF 1 EXH. FAN EF 2 EXH. FAN EF 3 MAKE-UP AIR MUA 1



EXH. FAN EF 4 EXH. FAN EF 5 EXH. FAN EF 6



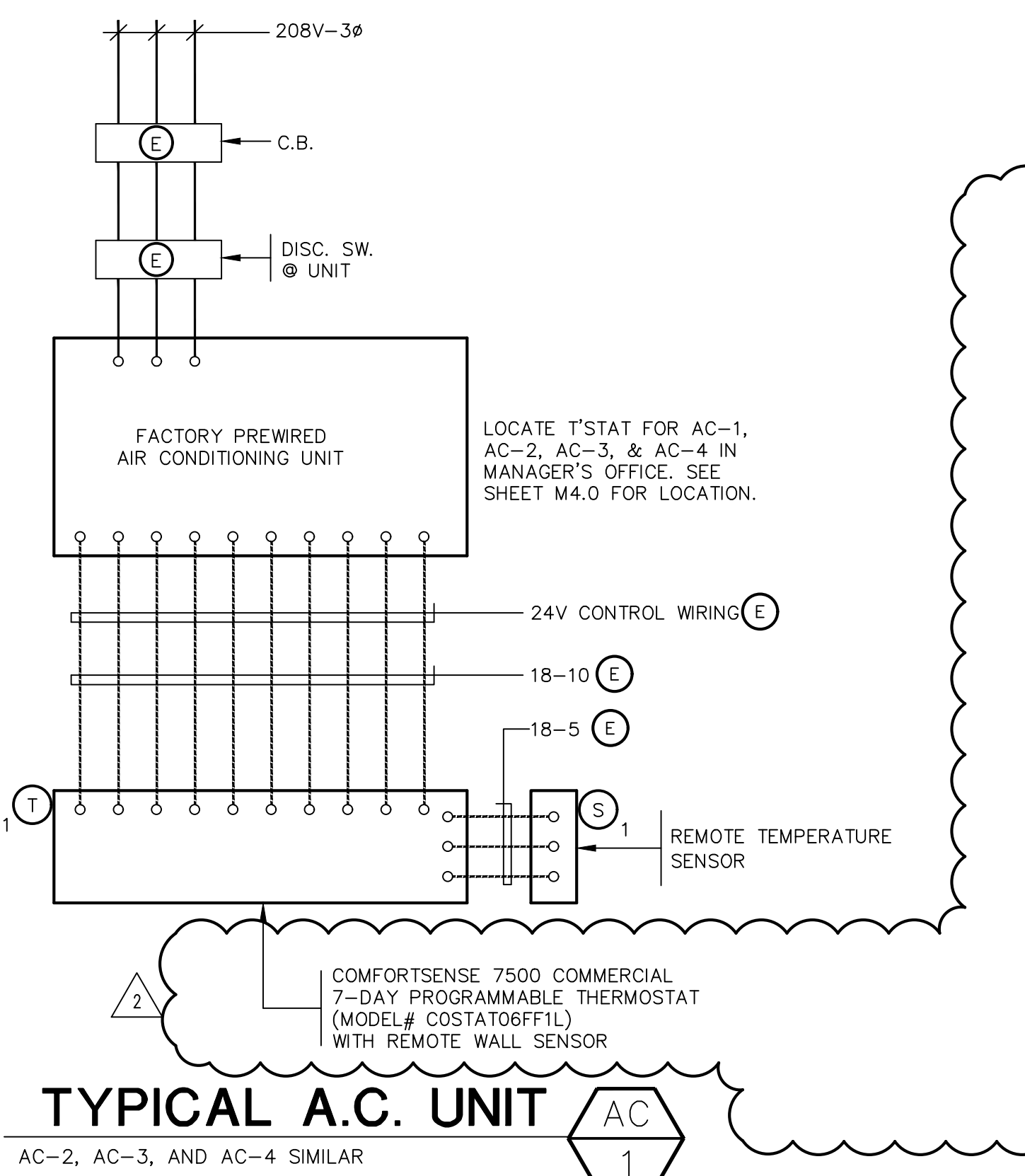
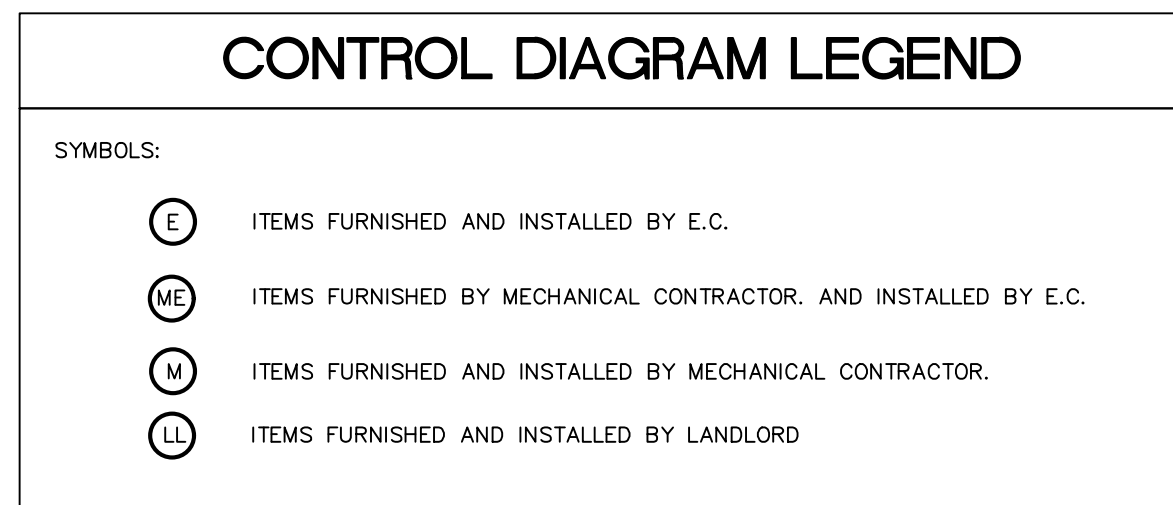
UNIT HEATER EUH 1

- ⊕ COMBINATION STARTER/DISCONNECT
- ⊕ STARTER FURNISHED WITH UNIT
- ⊕ ANSUL SYSTEM MICRO SWITCHES (BY K.E.C.)
- ⊕ ADDRESSABLE FIRE ALARM MODULE

GREASE EXHAUST HOOD FIRE PROTECTION SYSTEM (ANSUL) NOTES RELATING TO GREASE EXHAUST FANS AND MAKEUP AIR UNIT

UPON ACTIVATION OF THE GREASE EXHAUST HOOD FIRE PROTECTION SYSTEM (ANSUL), THE GREASE EXHAUST FANS AND MAKEUP AIR UNIT ARE AFFECTED IN THE FOLLOWING MANNER:

- MUA-1, MAKEUP AIR UNIT SERVING THE HOODS, IS SHUT DOWN. EF-1 THRU EF-3 WILL CONTINUE TO OPERATE.
- A SIGNAL IS SENT TO THE BUILDING FIRE ALARM PANEL. IN TURN A SIGNAL IS SENT FROM THE FIRE ALARM PANEL TO ALL AC UNITS FOR GLOBAL INSTANTANEOUS FAN SHUT DOWN.
- IF THE GREASE EXHAUST FANS, EF-1 THRU EF-3, AND MAKEUP AIR UNIT MUA-1 ARE OFF AT THE SYSTEM OFF-ON SWITCH, THE THREE GREASE EXHAUST FANS WILL BE OPERATIONAL. MUA-1 WILL NOT START.



TYPICAL A.C. UNIT AC 1

Thermal Ceramics
Insulating Our World

FastWrap® XL
Commercial Kitchen Grease Duct Enclosure System
Air Ventilation Duct Enclosure System

Product Data & Installation Guide

1. Product Description
FireMaster® FastWrap XL is a flexible blanket composed of high temperature fibers, classified for applications to 2100°F (1200°C) and fully encapsulated in a durable glass fiber reinforced foil facing for easy handling and installation. FireMaster XL is UL Classified and ULC Listed in various systems for 1 and 2 hour fire resistance enclosure protection, rated clearance for kitchen exhaust ducts, electrical circuit protection, and as a component in various UL firestop designs for fire resistance rated floors, ceilings, and walls. The core fibers in FireMaster XL are manufactured using Thermal Ceramics patented SuperWrap® fiber which is an alkali-earth silicate wool with low hygroscopicity and therefore increased safety for installers. FireMaster XL is under U.S.A. Follow-Up Service Program to ensure the consistent quality essential to the life safety application.

Product Features

- Zero clearance to combustibles at any location
- This and Lightweight at 1-1/2" (38mm) thick, 6 pcf (96 kg/m³) density
- Contours easily to complex duct designs
- Optimized installation with media layer butt joints on grease duct enclosures per ASTM E 2336
- Fully foil encapsulated for heat and clean installation
- Completely inorganic and non-combustible
- Contains 2100°F (1200°C) rated fibers for added safety margin
- Wide variety of through penetration firestop systems
- Resistant to mold growth
- Good sound absorption

2. Applications

- 1 and 2 hour enclosure and firestop system for kitchen exhaust ducts
- Zero clearance from enclosure to combustibles for kitchen exhaust ducts
- 1 and 2 hour enclosure and firestop system for hazardous exhaust ducts, pressurization ducts, clothes dryer exhaust ducts, trash and linen chutes, and other fire rated HVAC ducts
- 1 hour circuit integrity protection for cable trays and steel conduits
- Engineered solutions and tested systems for fire protection of structural steel beams and columns, and storage vessels per ASTM E 119, ISO 834 and UL 1709

3. Physical Characteristics

Material	Min. Size	Min. Thickness	Min. Density
FastWrap XL	1/2" x 24" x 20"	1 1/2"	6 pcf (96 kg/m ³)
FastWrap XL	1/2" x 48" x 20"	1 1/2"	6 pcf (96 kg/m ³)
FastWrap XL Color	1/2" x 48" x 20"	1 1/2"	6 pcf (96 kg/m ³)

Media layer with steel encapsulation.

4. Performance Specifications

Reference Standard	Standard No.	Performance
Grease Duct Enclosure System	ASTM E2336	Pass
Non-Combustibility	ASTM E136	Pass
Section 15.2.2.2.2 Resistance (wall)	ASTM E119	Pass
Section 15.3 - Disability Test	ASTM E518	Pass
Section 15.1 - Thermal Fire Test	ASTM E2308	Pass
Section 15.5 - Fire Equipment	ASTM E814/E119	Pass
ULC Grease Duct Test Protocol	ULC 1978	Pass
ULC Grease Duct Enclosure	ULC 1978	Pass
Fire Stopping Characteristics	ASTM E814	Pass
Fire Stopping Characteristics	ASTM E814	Pass
Fire Stopping Characteristics	ASTM E814	Pass
Thermal Resistance (R-value)	ASTM C518	7.1 per inch
Thermal Resistance (R-value)	ASTM C518	Resistant

5. Listings/Building Code Agency

Listing User	Agency Listing	Layers
Grease Duct Enclosure per ASTM E2336 and A1101	ICC ECR 2213	2
Grease Duct Enclosure per ULC 1978	ULC 1978	2
Grease Duct Enclosure Test Protocol	ULC 1978	2
Through Penetration Fire Stop System per ASTM E814, UL 1479	ULC - See Figure 2 1 x 2	2
Through Penetration Fire Stop System per ISO 834-1995	ULC - See Figure 2 1 x 2	2
Ventilation Duct Enclosure System per ISO 834-1995	ULC - See Figure 2 1 x 2	2
Electrical Circuit Protection System	UL P4616	2

6. Storage
FastWrap XL must be stored in a dry warehouse environment on pallets. Pallets should not be stacked.

7. Installation
FastWrap XL shall be installed by a qualified contractor in accordance with manufacturer's instructions and design drawings. See Figures 1 to 5 for complete details.

Materials and Equipment

- FastWrap XL blanket
- Aluminum foil tape
- Glass filament reinforced tape (optional)
- Carbon steel or stainless steel banding material, minimum 1/2" (13mm) wide, minimum 0.015" (0.4mm) thick, with steel banding clips
- Hand banding tensioner and crimping tool
- Minimum 1/2" (38mm) steel insulation pins, steel angle clips, minimum 1/2" (38mm) square or 1/2" (38mm) diameter, or equivalent steel angle-hanger pins
- Capacitor discharge stud with ground
- FireMaster F2-HT-XL Prohibited Door or Fire Fabricated Door Hardware
- An approved firestop sealant

General
To minimize waste, FastWrap XL blanket should be rolled out fully before measuring. Cut edges of the blanket shall be taped with aluminum foil tape to prevent exposed edges of the insulation absorbing grease and moisture in the event of a compromised grease duct joint. Overlaps are used to block heat transfer in the event of duct deformation resulting from normal expansion. Flange tape is suggested to temporarily hold the blanket in place until steel banding or pinning is installed to permanently secure the blanket.

A. First Layer / Single Layer Installation

1) Blanket Joint: For ASTM E2336 compliant grease duct enclosures (Figure 1), the first layer of FastWrap XL is cut to completely wrap around the perimeter of the duct with enough excess to provide a 1/4" (6mm) overlap where the blanket joints meet. The joints of adjacent blankets are firmly butted against each other.

2) Overlap required for ISO 834 compliant single layer air ventilation duct enclosures and two layer grease duct enclosures installed in Canada (Figure 1): The first layer of FastWrap XL applied directly to the duct is cut to completely wrap around the perimeter of the duct with enough excess to overlap itself by a minimum of 9" (229mm). The joints of adjacent blankets must overlap each other by a minimum of 2" (51mm).

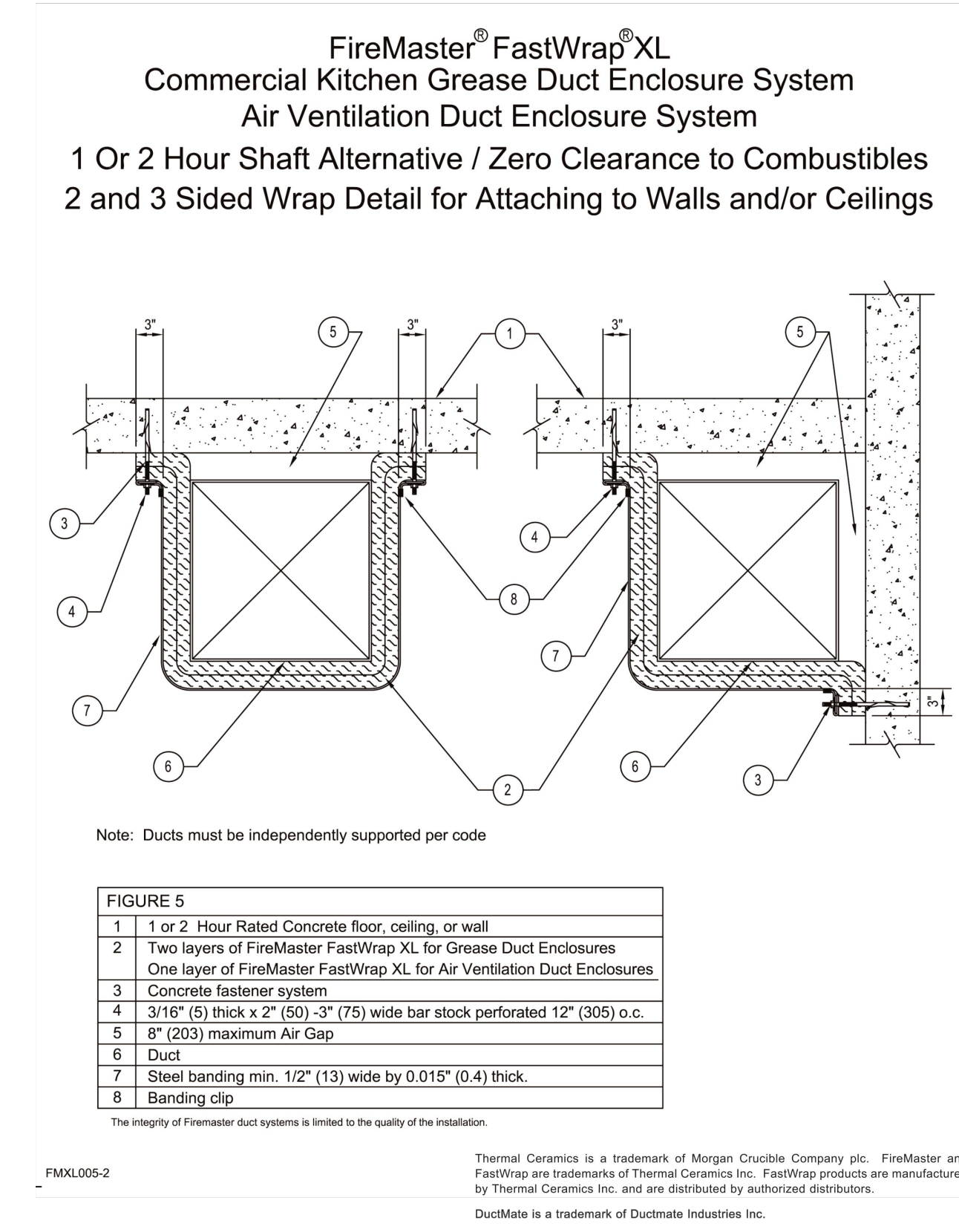
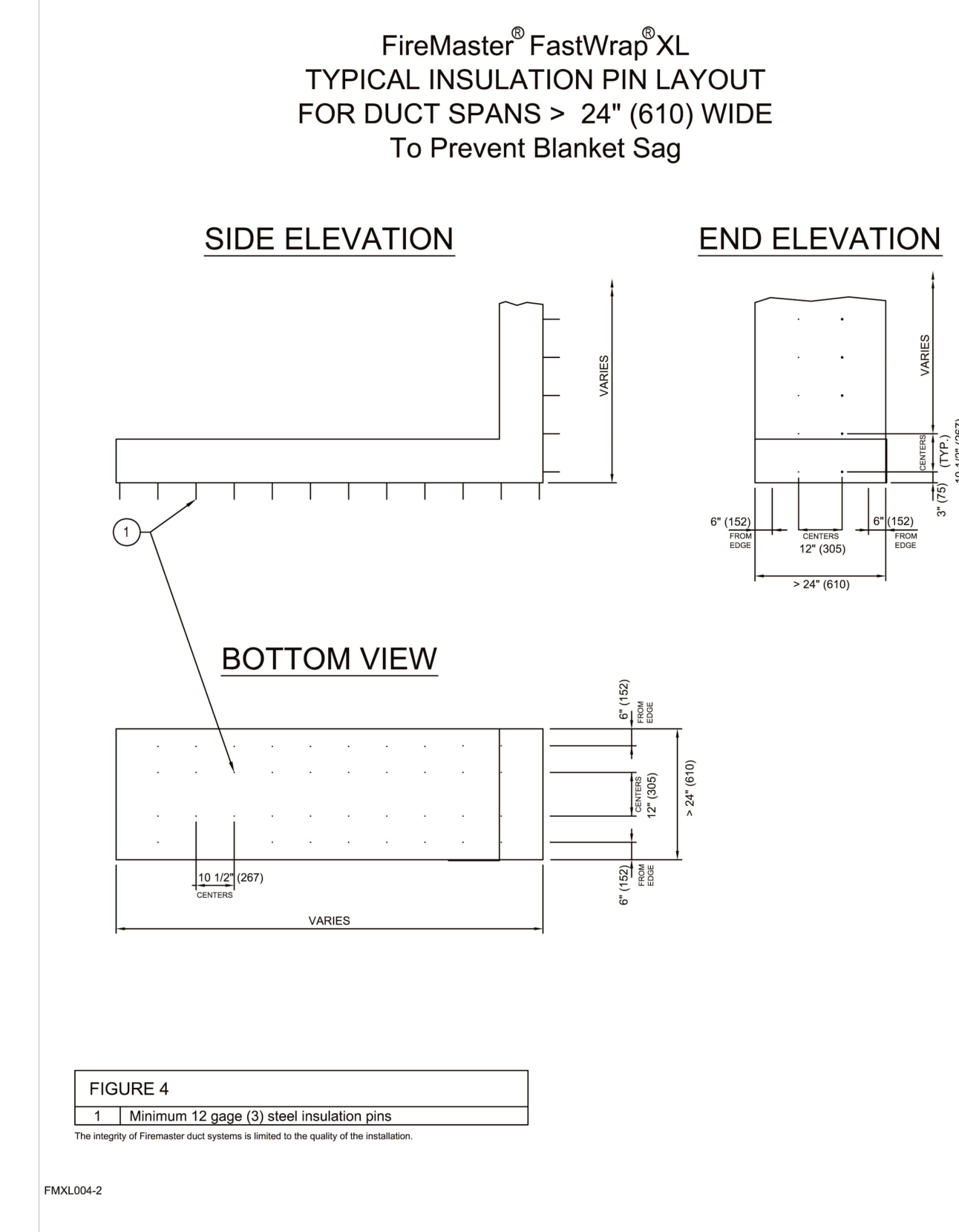
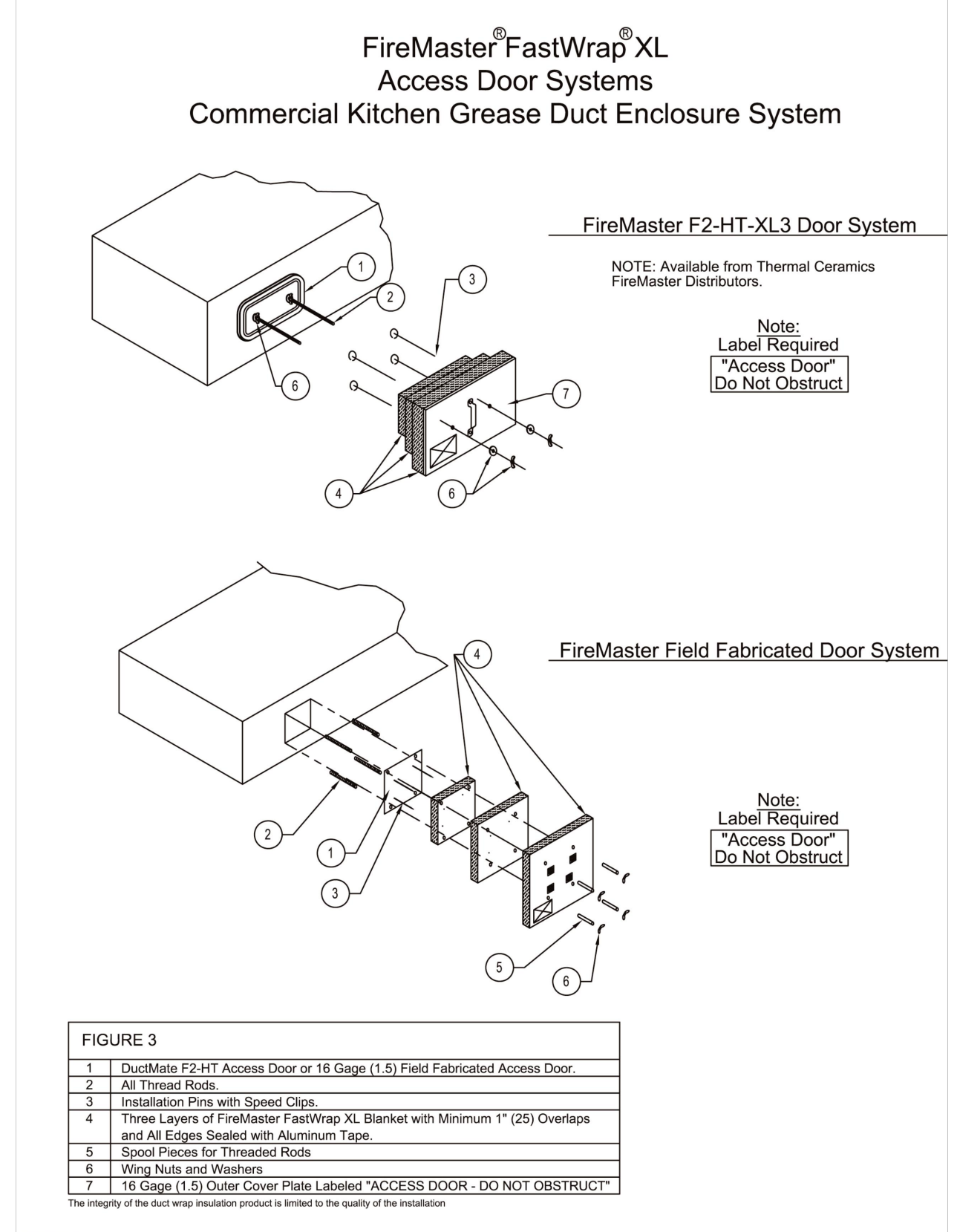
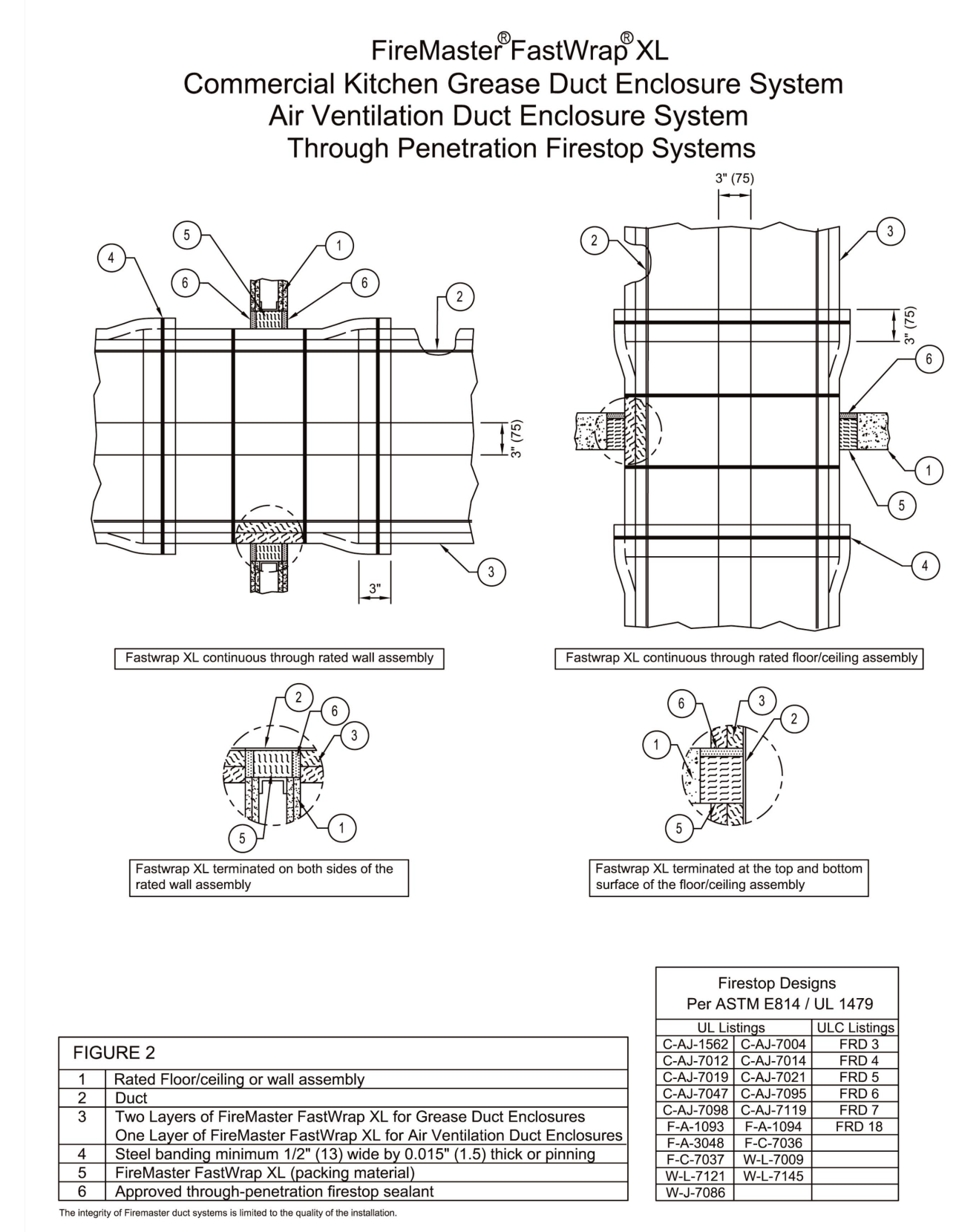
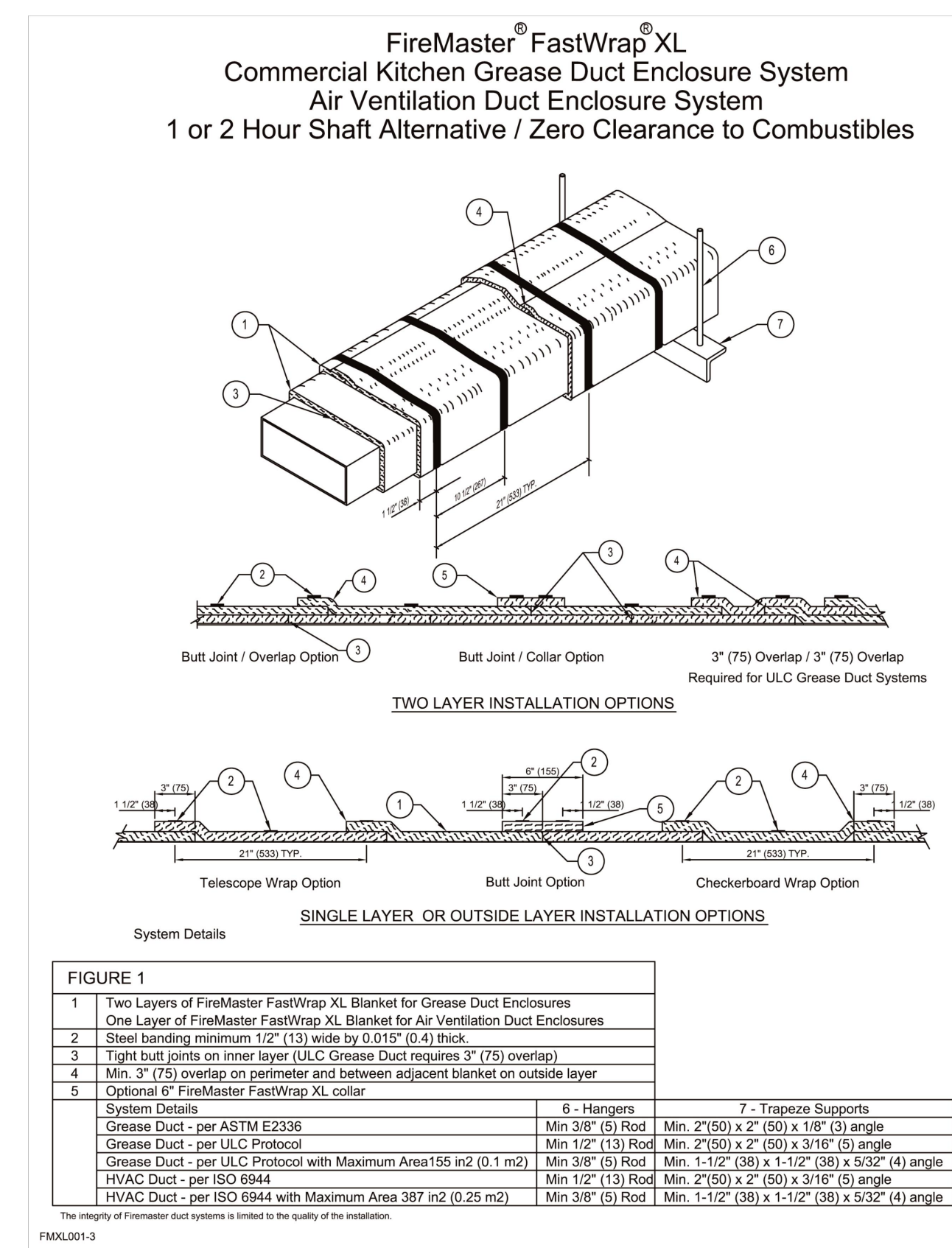
B. Second Layer Where Required - (Figure 1)
The second layer of FastWrap XL is cut to completely wrap around the perimeter of the first layer, with enough excess to overlap itself not less than 2" (51mm). Joints in the second layer should be staggered a minimum of 9" (229mm) from joints on the lower layer. Adjacent blankets on the second layer must overlap each other by not less than 3" (76mm). As an alternative to overlap, adjacent blankets installed on the second layer, adjacent blankets can be tightly butted against with a 1/2" (13mm) wide FastWrap XL joint covered with the but joint.

3) Field Fabricated Access Doors (Figure 3): Each access door assembly has four threaded rods, 1/4" (6mm) in diameter and 9" (229mm) in length, with one welded to each corner and 9" (229mm) from the corner. The rods, 4-1/2" (114mm) long are installed outside the access cover plate and over the threaded rods. Four 1/2" (38mm) diameter and 4-1/2" (114mm) long steel insulation pins are welded to the access cover plate and used for installation of the three layers of FastWrap XL. One layer of FastWrap XL is cut to approximately the same size as the access panel, and installed over the insulation pins on the panel. A second

layer of FastWrap XL is cut to an overlap the first layer a minimum of 1-1/2" (38mm). It is essential that the first and second layer fit tightly against the surrounding area with no through openings. The third and outside layer should be cut to overlap the second insulation layer by a minimum of 1-1/2" (38mm). Minimum 1/2" (38mm) round or square insulation clips are installed on the insulation pins to secure the three layers of insulation to the access cover plate. All cut edges of the insulation shall be taped with minimum 3/8" (9.5mm) wide aluminum foil tape. Wire nuts and washers are installed on the four threaded rods, and tightened against the nutted steel plates to seal the access cover plate to the duct.

3) Field Installed Ductable Access Doors (Figure 3):
Ductable Ultimate and F2 doors are approved for use with FireMaster XL and shall be installed according to Ductable Ultimate installation instructions. A 1/8" (3mm) diameter outer cover plate is required which is (152mm) larger in width and length than the Ductable door, and which has holes drilled to match the threaded rods on the Ductable door. Four 1/2" (38mm) diameter pins are welded to the outer cover plate, and three layers of FastWrap XL are installed and fastened using minimum 1/2" (38mm) insulation pins. The insulation pins adjacent to the Ductable door is cut to the size of the door and each successive layer has an overlap of 1-1/2" (38mm) and the adjacent layer. It is essential that the first and second layer fit tightly against the surrounding area with no through openings. All edges of insulation blanket must be sealed with minimum 3/8" (9.5mm) wide aluminum foil tape. The insulation cover plate is installed over the Ductable threaded rods, and held tight against the duct with wire nuts and washers.

4) FireMaster Factory Built Access Doors (Figure 3):
FireMaster doors are tested per ASTM E2336 and are intended for use in two layer installations. FireMaster access doors come complete and ready for installation with a Ductable® F2 access door control receptacle, an outside cover plate with proper signage, and an approved firestop sealant. The firestop sealant must be applied to the annular space. The packing material must be compressed into the annular space. The packing material must be compressed tightly into the cut out area. All cut edges of the new section must be taped and sealed with aluminum foil tape. The new section must be placed with other wiring prior to banding per Thermal Ceramics installation instructions. The replacement material must be filled with a minimum thickness of approved firestop sealant. The packing material used and compression, minimum recessed typically 1/4" (6mm), and approved firestop sealant and fireMaster (typically 1/4" (6mm)) shall be as specified in an approved UL / ULC firestop design listing. Where there is not sufficient annular space around the duct to fit the FastWrap XL, enclosure system cutthrough through the fire stop assembly.



Consultant

PWD
MECHANICAL ENGINEERS

PACIFIC WEST DESIGN, INC.
MECHANICAL AND PLUMBING ENGINEERS
18277 Passadena Street - Suite 106
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(951) 226-0140

Stamp and Signature

EXPIRATION DATE: 12-31-2019

Issuance Date: 02/07/2019
Description: COORDINATION SET

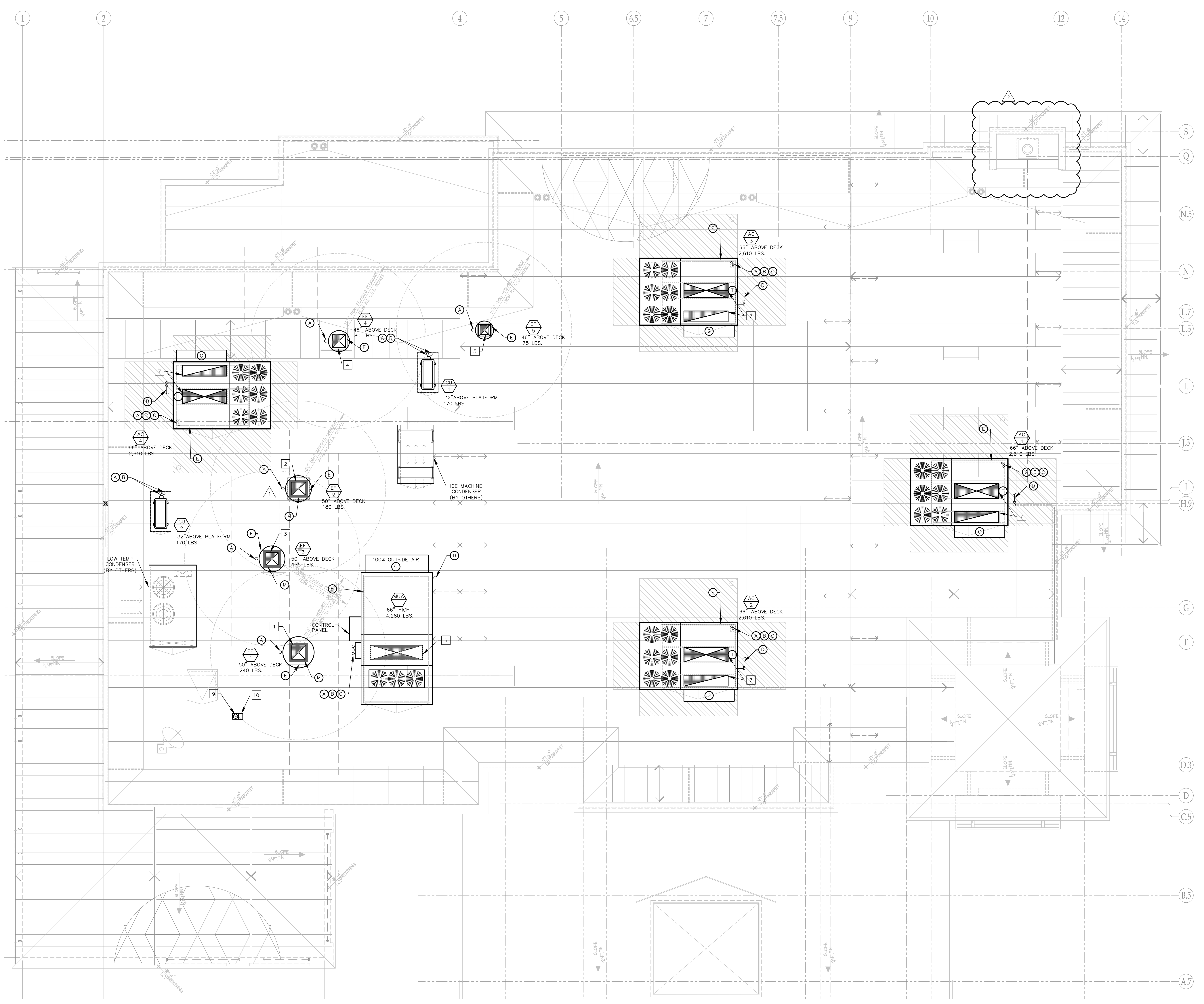
02/07/2019 PLAN CHECK SUBMITTAL
02/27/2019 HEALTH DEPT. RESUBMITTAL
02/27/2019 ISSUED FOR RFI
04/25/2019 E-MAILED FOR CONSTRUCTION

Revision Date No. Description
02/07/2019 1 PLAN CHECK RESUBMITTAL
05/13/2019 2 HEALTH DEPT. RESUBMITTAL
05/29/2019 3 BD ADDENDUM
04/03/2019 4 PLAN CHECK RESUBMITTAL
04/25/2019 5 BULLETIN #1

Project Name and Location
MONTCLAIR PLAZA SHOPPING CENTER
5200 N MONTCLAIR PLAZA LANE
MONTCLAIR, CA 91763

Sheet Title
WIRING DIAGRAMS, DETAILS & SECTIONS

Project No.: M2.0
Sheet No.: 1
Print Date: 25 April 2019



PLAN NOTES

- 1 20"x20" 16 GA WELDED D.T.R. (5,000 CFM @ 1,800 FPM).
- 2 20"x18" 16 GA WELDED D.T.R. (4,200 CFM @ 1,680 FPM).
- 3 18"x18" 16 GA WELDED D.T.R. (3,800 CFM @ 1,689 FPM).
- 4 18"x18" SEALED ALUMINUM D.T.R. (1,400 CFM).
- 5 12"x12" GENERAL EXHAUST D.T.R. (700 CFM).
- 6 71"x21" MAKE UP AIR D.T.R. (10,790 CFM).
- 7 60"x20"(L) SA & 60"x18"(L) BA D.T.R.
- 8 NOT USED.
- 9 60"x18" SEALED ALUMINUM D.T.R. (1,400 CFM).
- 10 ROOF JACK.

Consultant

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03/29/2019		BD ADDENDUM
04/03/2019		PLAN CHECK RESUBMITTAL
04/25/2019		BULLETIN #1

SPARE PARTS - STORED INSIDE ROOF TOWER

GREENHECK FANS -
1 OF 3 HP & MATCHING BELTS FOR EF-1 & EF-2
1 OF 1 1/2 HP & MATCHING BELTS FOR EF-3

DAIKIN - MUA-1
1 OF 10 HP & MATCHING BELTS

ROOF EQUIPMENT LEGEND

- A INDICATES LINE VOLTAGE CONDUIT AND WIRING STUB-UP LOCATION CONNECTION TO EQUIPMENT BY ELECTRICAL CONTRACTOR. AC-X UNITS CONNECT INSIDE ROOF CURB.
- B INDICATES LOW VOLTAGE CONDUIT AND WIRING STUB-UP LOCATION CONNECTION TO EQUIPMENT BY ELECTRICAL CONTRACTOR. AC-X UNITS CONNECT INSIDE ROOF CURB.
- C INDICATES GAS PIPING STUB-UP LOCATION AND CONNECTION TO EQUIPMENT BY THE PLUMBING CONTRACTOR. COMPLETE WITH DIRT LEG AND SHUT-OFF VALVE.
- D INDICATES TRAPPED AND VENTED CONDENSATE DRAIN PIPE WITH DISCHARGE TO AN APPROVED RECEPTOR BY THE PLUMBING CONTRACTOR.
- E INDICATES FACTORY CURB, FURNISHED AND SET IN PLACE BY THE MECHANICAL CONTRACTOR. SECURED TO ROOF BY THE GENERAL CONTRACTOR.
- F INDICATES FIELD FABRICATED LEVEL WOOD ROOF CURB FROM NOMINAL 2" X LUMBER BY THE GENERAL CONTRACTOR, COMPLETE WITH CANT STRIP.
- G INDICATES FACTORY ECONOMIZER OSA INTAKE OR MINIMUM OSA WEATHER HOOD WITH BACKDRAFT DAMPER, MANUAL VOLUME DAMPER AND BIRDSCREEN, AS APPLICABLE.
- H INDICATES 3/4" DRAIN PIPE TO APPROVED RECEPTOR BY THE PLUMBING CONTRACTOR.
- I INDICATES APPLIANCE FLUE VENT DISCHARGE.
- J INDICATES "GREASE EXHAUST CLEAN-OUT" ACCESS.
- K INDICATES APPROVED TYPE SMOKE DETECTOR, LOCATED UP STREAM OF UNIT OSA INTAKE.
- L INDICATES CONNECTION OF 3/4" CONDENSATE DRAIN LINE BY PLUMBING CONTRACTOR, ROUTED TO AN APPROVED RECEPTOR. NO TRAP OR VENT REQUIRED.
- M INDICATES GREASE EXHAUST DUCTWORK TO FAN CONNECTION WRAPPED WITH 2-LAYERS FIRE WRAP. SEE SHEET M2.0 FOR SPECIFICATION.
- N INDICATES 1/2" DOMESTIC CITY WATER SUPPLY STUB-UP LOCATION AND 1/4" CONNECTION TO EQUIPMENT COMPLETE WITH SHUT-OFF VALVE.
- O INDICATES FACTORY PLATFORM, FURNISHED AND SET IN PLACE BY THE MECHANICAL CONTRACTOR. SECURED TO ROOF BY THE GENERAL CONTRACTOR.
- P INDICATES ANGLE IRON SUPPORT SET ON ERICO PIPE BASE PIER.
- Q INDICATES DUCT MOUNTED SMOKE DETECTOR IN SUPPLY AIR PLENUM INSIDE UNIT. ACCESSIBLE THROUGH UNIT ACCESS DOOR - LABEL ON UNIT ACCESS DOOR SHALL INDICATE "SMOKE DETECTOR INSIDE THIS ACCESS PANEL".

Project Name and Location

Lazy Dog
MEAT & BUNDBURG

MONTCLAIR PLAZA SHOPPING CENTER
5200 N MONTCLAIR PLAZA LANE
MONTCLAIR, CA 91763

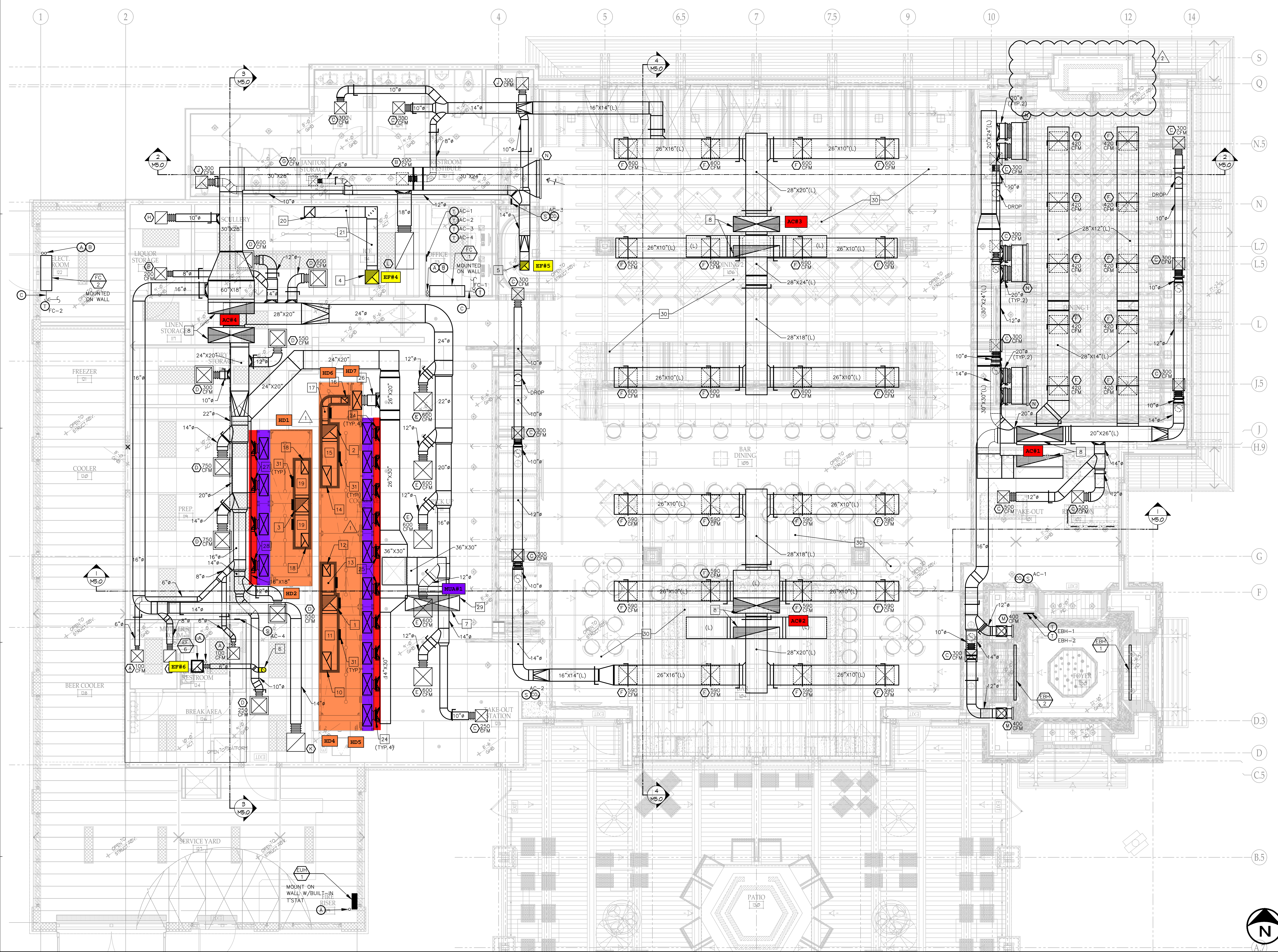
Sheet Title

MECHANICAL ROOF PLAN

Sheet No.:

M3.0

Print Date: 25 April 2019



- ### PLAN NOTES
- 20"x20" 16 GA WELDED U.T.R. TO EF-1 (5,000 CFM @ 1,800 FPM).
 - 20"x18" 16 GA WELDED U.T.R. TO EF-2 (4,200 CFM @ 1,680 FPM).
 - 18"x18" 16 GA WELDED U.T.R. TO EF-3 (3,800 CFM @ 1,689 FPM).
 - 18"x18" SEALED ALUMINUM U.T.R. TO EF-4 (1,400 CFM).
 - 12"x12" GENERAL EXHAUST U.T.R. TO EF-5 (700 CFM).
 - 6" EXHAUST U.T.R. TO ROOF JACK (100 CFM).
 - 71"x21" MAKE UP AIR U.T.R. TO MUA-1 (10,790 CFM).
 - 60"x20"(L) 24" & 60"x18"(L) 24" U.T.R. TO AC UNIT.
 - NOT USED.
 - 12"x24" 16 GA WELDED INTO HOOD (3,200 CFM @ 1,600 FPM).
 - 20"x14" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (3,200 CFM @ 1,646 FPM).
 - 10"x16" 16 GA WELDED INTO HOOD (1,800 CFM @ 1,620 FPM).
 - 16"x10" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (1,800 CFM @ 1,620 FPM).
 - 12"x26" 16 GA WELDED INTO HOOD (3,400 CFM @ 1,569 FPM).
 - 20"x14" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (3,400 CFM @ 1,749 FPM).
 - 8"x9" 16 GA WELDED INTO HOOD (800 CFM @ 1,600 FPM).
 - 8"x9" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (800 CFM @ 1,600 FPM).
 - 10"x18" 16 GA WELDED INTO HOOD (1,900 CFM @ 1,520 FPM).
 - 18"x10" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (1,900 CFM @ 1,520 FPM).
 - 14"x14" SEALED ALUMINUM INTO HOOD (1,400 CFM).
 - 14"x14" SEALED ALUMINUM, SLOPE DN. TOWARDS HOOD (1,400 CFM).
 - NOT USED.
 - NOT USED.
 - 14" MUA INTO 28"x12" MAKE UP AIR PLENUM (650 CFM).
 - 14" MUA INTO 28"x12" MAKE UP AIR PLENUM (800 CFM).
 - 14" MUA INTO 24"x12" MAKE UP AIR PLENUM (640 CFM).
 - 14" MUA INTO 28"x12" MAKE UP AIR PLENUM (825 CFM).
 - 14" MUA INTO 28"x12" MAKE UP AIR PLENUM (850 CFM).
 - 70" WIDE X 20" DEEP X 48" LONG SOUND TRAP IN VERTICAL RISER (10,790 CFM).
 - EXPOSED DUCT IN THIS AREA - DUCT TO BE PAINT RED.
 - GREASE EXHAUST CLEAN OUT ACCESS DOOR.

ISSUANCE

Date	Description
02/09/2019	COORDINATION SET
02/09/2019	PLAN CHECK SUBMITTAL
02/09/2019	HEALTH DEPARTMENT SUBMITTAL
02/27/2019	ISSUED FOR RFI
04/25/2019	ISSUED FOR CONSTRUCTION

REVISION

Date	No.	Description
03/07/2019	1	PLAN CHECK RESUBMITTAL
03/13/2019	2	HEALTH DEPT. RESUBMITTAL
03/29/2019	3	BD ADDENDUM
04/03/2019	4	PLAN CHECK RESUBMITTAL
04/25/2019	5	BULLETIN #1

- ### DUCTWORK NOTES
- NO DUCTWORK SHALL PASS OVER ELECTRICAL PANELS IN PREPARATION KITCHEN AREA
 - ALL MUA'S SHALL HAVE RED TAG FOR IDENTIFICATION
 - DUCTS ADJACENT TO HOOD SHALL BE RUN AS HIGH AS POSSIBLE TO ALLOW HOOD ACCESS.
- ### NOTES
- PROVIDE SPIN IN FITTING WITH EXTRACTOR AT ALL ROUND TO RECTANGULAR DUCT TAPS

EQUIPMENT LEGEND

- INDICATES LINE VOLTAGE CONDUIT AND WIRING. STUB-UP LOCATION CONNECTION TO EQUIPMENT BY ELECTRICAL CONTRACTOR.
- INDICATES LOW VOLTAGE CONDUIT AND WIRING. STUB-UP LOCATION CONNECTION TO EQUIPMENT BY ELECTRICAL CONTRACTOR.
- INDICATES 3/4" CONDENSATE DRAIN (BY P.C.)

DIFFUSER SCHEDULE

TAG	SIZE	TYPE	MAKE	MODEL	MOUNTING	REMARKS
(A)	10"x10"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-
(B)	12"x12"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-
(C)	16"x16"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-
(D)	20"x20"	MODULAR CORE	METAL-AIRE	90006	T-BAR CEILING	LAY-IN
(E)	20"x20"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-
(F)	20"x20"	MODULAR CORE	METAL-AIRE	90001	EXPOSED	-
(G)	10"x10"	FIX. BLD.	METAL-AIRE	RHD	GYP. BD. CEILING	-
(H)	12"x12"	FIX. BLD.	METAL-AIRE	RHD	GYP. BD. CEILING	-
(I)	16"x16"	FIX. BLD.	METAL-AIRE	RHD	GYP. BD.	-
(J)	22"x22"	FIX. BLD.	METAL-AIRE	RHD	T-BAR CEILING	LAY-IN
(K)	48"x22"	FIX. BLD.	METAL-AIRE	RHD	T-BAR CEILING	LAY-IN
(L)	6"x24"	FIX. BLD.	METAL-AIRE	2015	VERTICAL	SIDEWALL SUPPLY
(M)	48"x30"	FIX. BLD.	METAL-AIRE	RHD	SIDEWALL	RETURN
(N)	28"x18"	FIX. BLD.	METAL-AIRE	-	SIDEWALL	SUPPLY

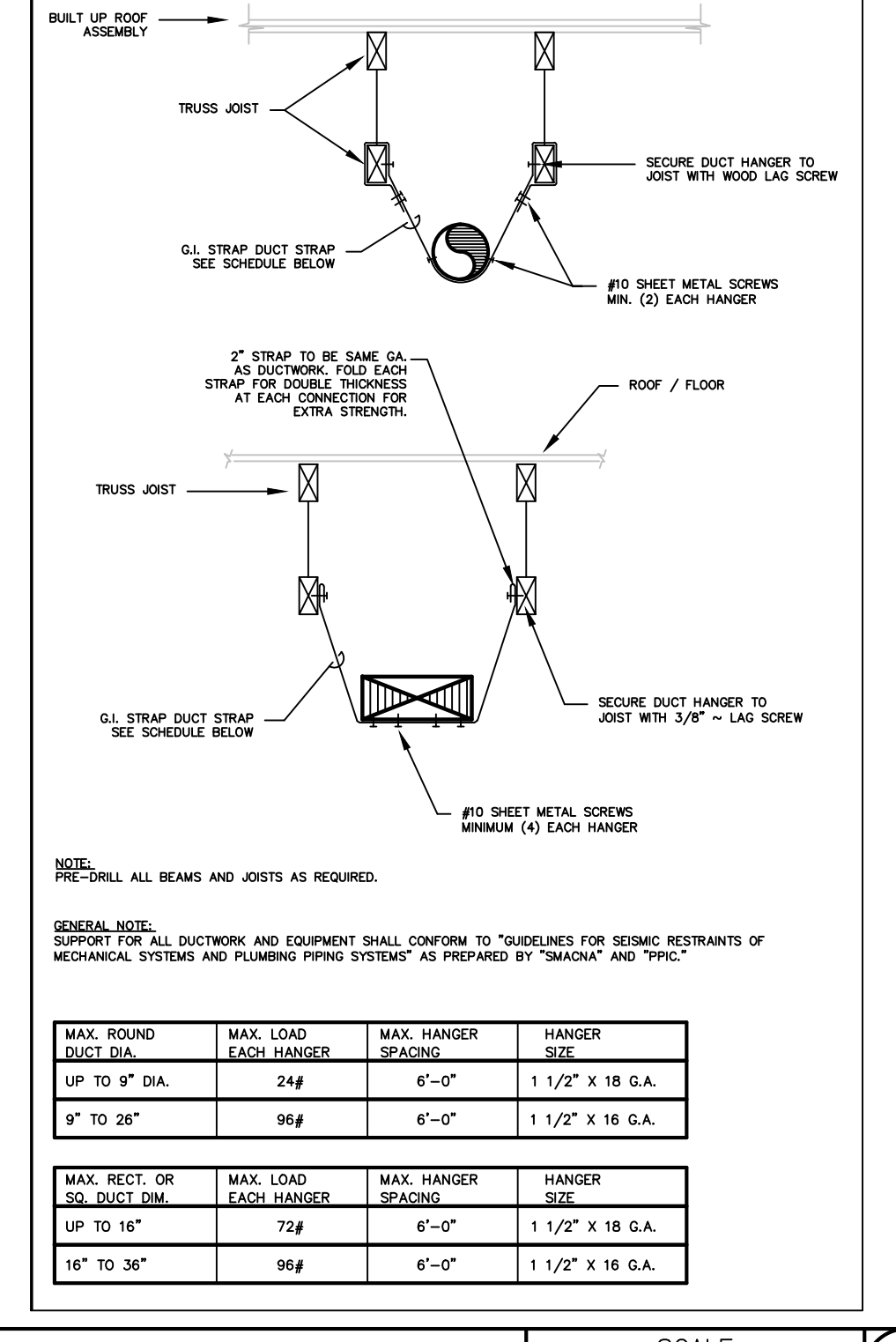
KEY NOTES:

INDICATES LINE VOLTAGE CONDUIT AND WIRING. STUB-UP LOCATION CONNECTION TO EQUIPMENT BY ELECTRICAL CONTRACTOR.

INDICATES LOW VOLTAGE CONDUIT AND WIRING. STUB-UP LOCATION CONNECTION TO EQUIPMENT BY ELECTRICAL CONTRACTOR.

INDICATES 3/4" CONDENSATE DRAIN (BY P.C.)

FLOOR PLAN SCALE 1/4" = 1'-0"



MECHANICAL DUCT SUSPENSION DETAIL SCALE NONE

Consultant
PWD
 MECHANICAL ENGINEERS
PACIFIC WEST DESIGN, INC.
 MECHANICAL AND PLUMBING ENGINEERS
 18277 Passadena Street - Suite 106
 Lake Elsinore, CA 92530
 (951) 226-0140

Stamp and Signature

 EXPIRATION DATE: 12-31-2019

ISSUANCE

Date	Description
02/09/2019	COORDINATION SET
02/09/2019	PLAN CHECK SUBMITTAL
02/09/2019	HEALTH DEPARTMENT SUBMITTAL
02/27/2019	ISSUED FOR RFI
04/25/2019	ISSUED FOR CONSTRUCTION

REVISION

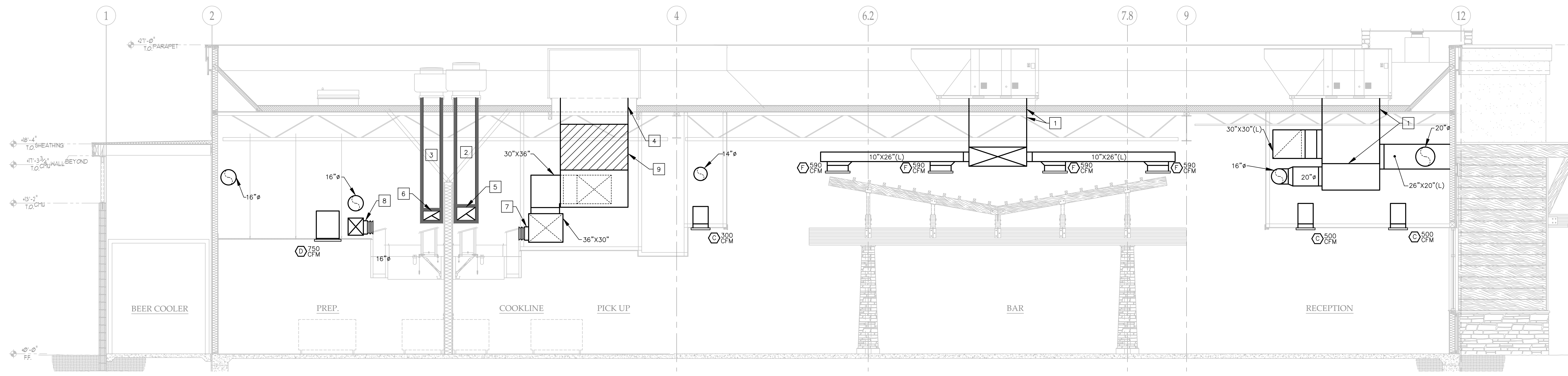
Date	No.	Description
03/07/2019	1	PLAN CHECK RESUBMITTAL
03/13/2019	2	HEALTH DEPT. RESUBMITTAL
03/29/2019	3	BD ADDENDUM
04/03/2019	4	PLAN CHECK RESUBMITTAL
04/25/2019	5	BULLETIN #1

Project Name and Location

Lazy Dog
 MONTCLAIR PLAZA SHOPPING CENTER
 5200 N MONTCLAIR PLAZA LANE
 MONTCLAIR, CA 91763

MECHANICAL FLOOR PLAN

Sheet No.:
M4.0
 Print Date: 25 April 2019



MECHANICAL SECTION - BOH, BAR, AND RECEPTION

SCALE
1/4" = 1'-0"

1

PLAN NOTES

- 60"x20"(L) SA & 60"x18"(L) RA U.T.R. TO AC-UNIT.
- 20"x20" 16 GA WELDED U.T.R. TO EF-1 (5,000 CFM @ 1,800 FPM).
- 18"x18" 16 GA WELDED U.T.R. TO EF-3 (3,800 CFM @ 1,689 FPM).
- 71"x21" MAKE UP AIR U.T.R. TO MUA-1 (10,790 CFM).
- 20"x14" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (1,900 CFM @ 1,520 FPM).
- 18"x10" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (1,900 CFM @ 1,520 FPM).
- 14" MUA INTO 28"x12" MAKE UP AIR PLENUM (850 CFM).
- 14" MUA INTO 28"x12" MAKE UP AIR PLENUM (850 CFM).
- 70" WIDE X 20" DEEP X 48" LONG SOUND TRAP IN VERTICAL RISER (10,790 CFM).

DIFFUSER SCHEDULE

TAG	SIZE	TYPE	MAKE	MODEL	MOUNTING	REMARKS
(C)	16"x16"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-
(D)	20"x20"	MODULAR CORE	METAL-AIRE	90006	T-BAR CEILING	LAY-IN
(E)	20"x20"	MODULAR CORE	METAL-AIRE	90001	EXPOSED	-
(F)	22"x22"	FIX. BLD.	METAL-AIRE	RHD	T-BAR CEILING	LAY-IN
(G)	48"x30"	FIX. BLD.	METAL-AIRE	RHD	SIDEWALL	RETURN

KEY NOTES:

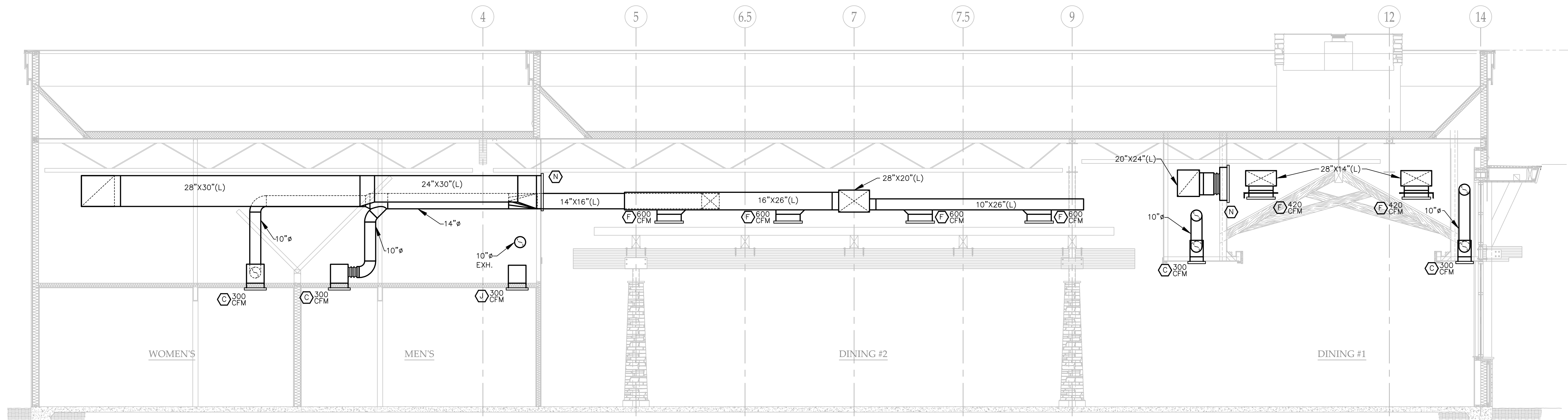
Consultant

PWD
MECHANICAL ENGINEERS

PACIFIC WEST DESIGN, INC.
MECHANICAL AND PLUMBING ENGINEERS
18277 Passadena Street - Suite 106
Lake Elsinore, CA 92530
(951) 226-0140

Stamp and Signature

EXPIRATION DATE: 12-31-2019



MECHANICAL SECTION - RESTROOMS, DINING #1, AND DINING #2

SCALE
1/4" = 1'-0"

2

PLAN NOTES

- XXXX.

DIFFUSER SCHEDULE

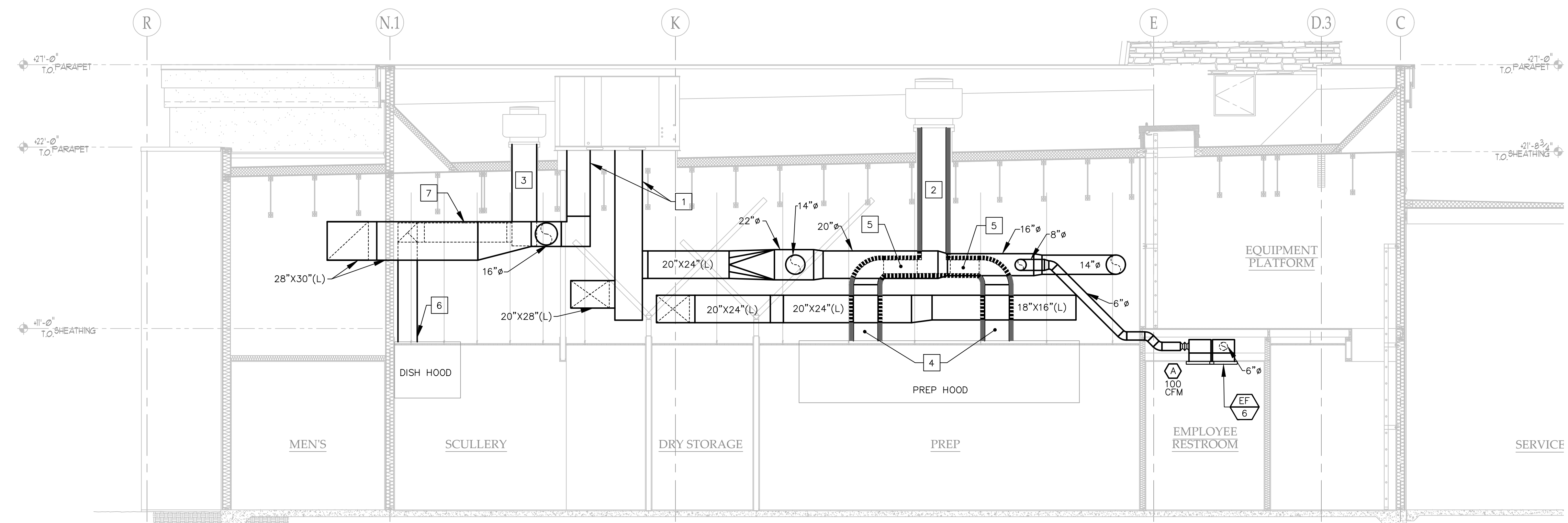
TAG	SIZE	TYPE	MAKE	MODEL	MOUNTING	REMARKS
(C)	16"x16"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-
(D)	20"x20"	MODULAR CORE	METAL-AIRE	90001	EXPOSED	-
(E)	16"x16"	FIX. BLD.	METAL-AIRE	RHD	GYP. BD.	-
(G)	48"x30"	FIX. BLD.	METAL-AIRE	RHD	SIDEWALL	RETURN

KEY NOTES:

Issue/Revisions

Date	Description
02/09/2019	COORDINATION SET
02/09/2019	PLAN CHECK SUBMITTAL
02/09/2019	HEALTH DEPARTMENT SUBMITTAL
02/27/2019	ISSUED FOR RFI
04/25/2019	ISSUED FOR CONSTRUCTION

Revision	Date	No.	Description
03/07/2019			PLAN CHECK RESUBMITTAL
03/13/2019			HEALTH DEPT. RESUBMITTAL
03/29/2019			BD ADDENDUM
04/03/2019			PLAN CHECK RESUBMITTAL
04/25/2019			BULLETIN #1



MECHANICAL SECTION - MEN'S RESTROOM, BOH, AND COOKLINE

SCALE
1/4" = 1'-0"

3

PLAN NOTES

- 60"x20"(L) SA & 60"x18"(L) RA U.T.R. TO AC-UNIT.
- 18"x18" 16 GA WELDED U.T.R. TO EF-3 (3,800 CFM @ 1,689 FPM).
- 18"x18" SEALED ALUMINUM U.T.R. TO EF-4 (1,400 CFM).
- 10"x18" 16 GA WELDED INTO HOOD (1,900 CFM @ 1,520 FPM).
- 18"x10" 16 GA WELDED, SLOPE DN. TOWARDS HOOD (1,900 CFM @ 1,520 FPM).
- 14"x14" SEALED ALUMINUM INTO HOOD (1,400 CFM).
- 14"x14" SEALED ALUMINUM, SLOPE DN. TOWARDS HOOD (1,400 CFM).

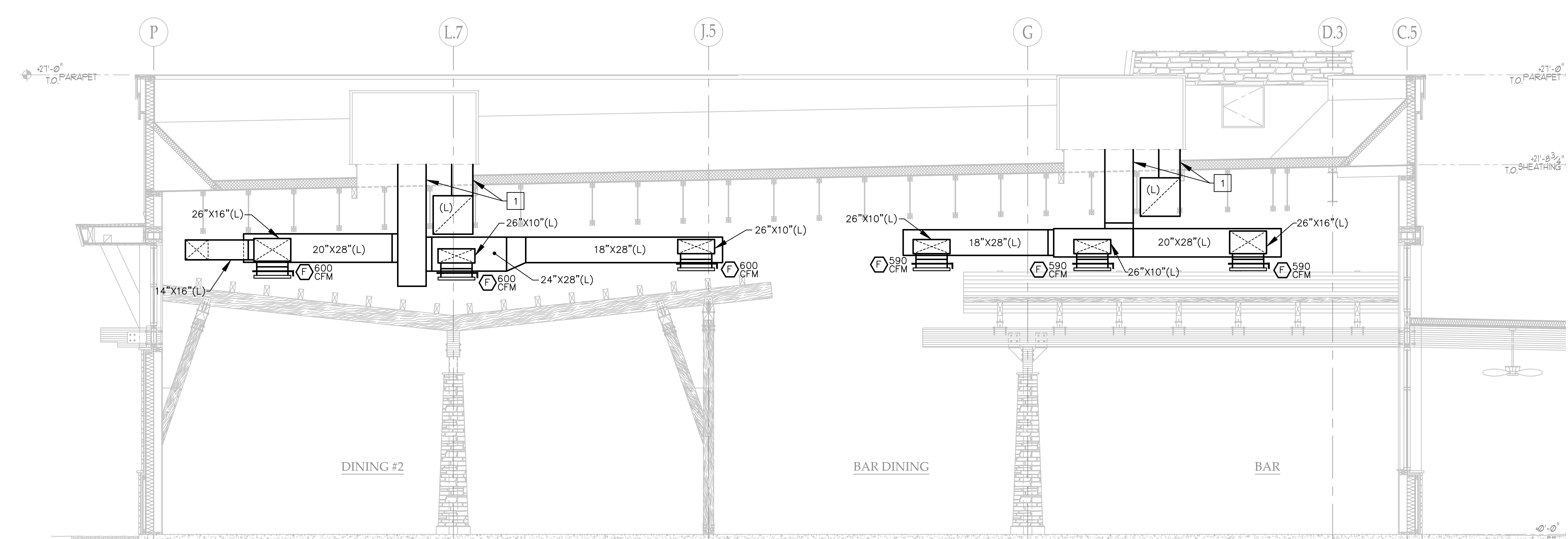
DIFFUSER SCHEDULE

TAG	SIZE	TYPE	MAKE	MODEL	MOUNTING	REMARKS
(A)	10"x10"	MODULAR CORE	METAL-AIRE	90001	GYP. BD. CEILING	-

KEY NOTES:

Project Name and Location

Lazy Dog
MONTCLAIR PLAZA SHOPPING CENTER
5200 N MONTCLAIR PLAZA LANE
MONTCLAIR, CA 94706



MECHANICAL SECTION - DINING #2, BAR DINING, AND BAR

SCALE
1/4" = 1'-0"

4

PLAN NOTES

- 60"x20"(L) SA & 60"x18"(L) RA U.T.R. TO AC-UNIT.

DIFFUSER SCHEDULE

TAG	SIZE	TYPE	MAKE	MODEL	MOUNTING	REMARKS
(E)	20"x20"	MODULAR CORE	METAL-AIRE	90001	EXPOSED	-

KEY NOTES:

Sheet Title

MECHANICAL SCHEDULES & DETAILS

Project No.: _____ Sheet No.: _____

M5.0

Print Date: 25 April 2019

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 2 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 3 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 4 of 20	

A. PROJECT GENERAL INFORMATION					
1. Project Location (city)	Montclair	8. Standards Version	Compliance 2016		
2. CA Zip Code	91763	9. Compliance Software (version)	EnergyPro 7.2		
3. Climate Zone	1D	10. Weather File	REVERSE-MARCHAF_72860_CZ010.epw		
4. Total Unconditioned Floor Area in Scope	14,669 ft ²	11. Building Orientation (deg)	(N) 0 deg		
5. Total Unconditioned Floor Area	19,177	12. Permitted Scope of Work	NewEnvelopeAndMechanical		
6. Total # of Stories (Above Grade)	1	13. Building Type(s)	Restaurants		
7. Total # of Dwelling Units	0	14. Site Type	NaturalSite		

B. COMPLIANCE RESULTS FOR PERFORMANCE COMPONENTS (Annual TDV Energy Use, kWh/ft ² -yr)				
§ 140.1				
1. Energy Component	2. Standard Design (TDV)	3. Proposed Design (TDV)	4. Compliance Margin (TDV)	5. Percent Better than Standard
Space Heating	0.00	0.04	-0.01	-33.3%
Space Cooling	470.70	321.57	82.13	30.3%
Indoor Fans	237.05	142.11	37.5%	15.8%
Heat Rejection	-	-	-	-
Pumps & Misc.	-	-	-	-
Domestic Hot Water	84.83	84.83	0.0%	0.0%
Indoor Lighting	113.80	113.80	0.0%	0.0%
COMPLIANCE TOTAL	981.55	797.82	224.23	22.8%
Receptacle	96.15	96.15	0.0%	0.0%
Process	1,177.39	1,177.39	0.0%	0.0%
Other Lig	-	-	-	-
Process Motors	-	-	-	-
TOTAL	2,250.09	2,030.86	-	9.9%

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 2 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 3 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 4 of 20	

C. PRIORITY PLAN CHECKS/ INSPECTION ITEMS (in order of highest to lowest TDV energy savings)					
1st	Indoor Fans: Check envelope and mechanical	Compliance Margin by Energy Component (from Table B column 4) Indoor Fans Space Cooling Heat Rejection Pumps & Misc. Domestic Hot Water Indoor Lighting Space Heating			
2nd	Space Cooling: Check envelope and mechanical				
3rd	Heat Rejection: Check envelope and mechanical				
4th	Pumps & Misc.: Check mechanical				
5th	Domestic Hot Water: Check mechanical				
6th	Indoor Lighting: Check lighting				
7th	Space Heating: Check envelope and mechanical				

D. EXCEPTIONAL CONDITIONS				
This project includes partial performance compliance scope options. The building must show compliance with all other applicable compliance scope options (performance or prescriptive) before any of the options listed below are used.				
The building does not include service water heating. Verify that service water heating is not required and is not included in the design.				
This project uses the Simplified Geometry Performance Modeling Approach which is not capable of modeling daylighting controls and assumes the prescriptive Secondary Daylight Control requirements are met. PRESCRIPTIVE COMPLIANCE documentation (form NRC-471-02-02) for the requirements of section 140.6(d) Automatic Daylighting Controls in Secondary Daylight Zones is required.				

E. HERS VERIFICATION				
This Section Does Not Apply				

F. ADDITIONAL REMARKS				
None Provided				

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 3 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 4 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 5 of 20	

G. COMPLIANCE PATH & CERTIFICATE OF COMPLIANCE SUMMARY					
Identify which building components use the performance or prescriptive path for compliance. "NA" = not in project					
For components that utilize the performance path, indicate the sheet number that includes mandatory notes on plans.					
Building Component	Compliance Path	Compliance Forms (Required for submittal)	Location of Mandatory Notes on Plans		
Envelope	<input checked="" type="checkbox"/> Performance	NRC-PRF-ENV-DETAILS (Section of the NRC-PRF-01-E)			
	<input type="checkbox"/> Prescriptive	NRC-ENV-01 / 02 / 03 / 04 / 05 / 06 / 07			
	<input type="checkbox"/> NA				
	<input type="checkbox"/> Performance	NRC-PRF-MCH-DETAILS (Section of the NRC-PRF-01-E)			
Mechanical	<input checked="" type="checkbox"/> Performance	NRC-MCH-01 / 02 / 03 / 04 / 05 / 06 / 07			
	<input type="checkbox"/> Prescriptive	NRC-PRF-PLB-DETAILS (Section of the NRC-PRF-01-E)			
	<input type="checkbox"/> NA				
	<input type="checkbox"/> Performance	NRC-PRF-01-E			
Domestic Hot Water	<input checked="" type="checkbox"/> Prescriptive	NRC-PRF-01-E			
	<input type="checkbox"/> NA				
	<input type="checkbox"/> Performance	NRC-PRF-01-E			
	<input type="checkbox"/> Prescriptive	NRC-PRF-01-E			
Lighting (Indoor Conditioned)	<input checked="" type="checkbox"/> Performance	NRC-LTI-01 / 02 / 03 / 04 / 05 / 06 / 07			
	<input type="checkbox"/> NA				
	<input type="checkbox"/> Performance	52 section of the NRC-PRF-01-E			
	<input type="checkbox"/> Prescriptive	NRC-PRC-01 / 03			
Covered Process: Commercial Kitchens	<input type="checkbox"/> NA				
	<input type="checkbox"/> Performance	53 section of the NRC-PRF-01-E			
	<input type="checkbox"/> Prescriptive	NRC-PRC-01 / 04			
	<input type="checkbox"/> NA				
Covered Process: Computer Rooms	<input type="checkbox"/> Performance	54 section of the NRC-PRF-01-E			
	<input type="checkbox"/> Prescriptive	NRC-PRC-01 / 04			
	<input type="checkbox"/> NA				
	<input type="checkbox"/> Performance	54 section of the NRC-PRF-01-E			
Covered Process: Laboratory Exhaust	<input type="checkbox"/> Prescriptive	NRC-PRC-01 / 09			
	<input type="checkbox"/> Performance				
	<input type="checkbox"/> NA				
	<input type="checkbox"/> Prescriptive	NRC-PRC-01 / 09			

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 4 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 5 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 6 of 20	

H. COMPLIANCE PATH & CERTIFICATE OF COMPLIANCE SUMMARY									
The following building components are only eligible for prescriptive compliance. Indicate which are relevant to the project.									
The following building components may have mandatory requirements per Part 6. Indicate which are relevant to the project.									
Yes	NA	Prescriptive Requirement	Compliance Forms	Yes	NA	Mandatory Requirement	Compliance Forms		
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Lighting (Indoor Unconditioned) §140.6	NRC-LTI-01 / 02 / 03 / 04 / 05 / 06	<input type="checkbox"/>	<input type="checkbox"/>	Commissioning §120.8	NRC-COR-01 / 02 / 03 / 04 / 05 / 06	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Lighting (Outdoor) §140.7	NRC-LTO-01 / 02 / 03 / 04	<input type="checkbox"/>	<input type="checkbox"/>	Electrical §120.9	NRC-ELE-01-E	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Lighting (Sign) §140.8	NRC-LTS-01-E	<input type="checkbox"/>	<input type="checkbox"/>	Solar Ready §130.10	NRC-SRA-01 / 03-E	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input checked="" type="checkbox"/>	Solar Thermal Water Heating §140.5	NRC-STW-01-E	<input type="checkbox"/>	<input type="checkbox"/>	Covered Process: §120.6	NRC-PRC-01-E	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	Parking Garage	NRC-PRG-01-E	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	Commercial Refrigeration	NRC-PRC-02-E	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	Warehouse Refrigeration	NRC-PRC-03-E	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	Compressed Air	NRC-PRC-04-E	<input type="checkbox"/>	<input type="checkbox"/>
				<input type="checkbox"/>	<input type="checkbox"/>	Process Boilers	NRC-PRC-11-E	<input type="checkbox"/>	<input type="checkbox"/>

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance Report Version: NRC-PRF-01-E-08022018-5302 Report Generated at: 2019-03-07 13:05:46

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance Report Version: NRC-PRF-01-E-08022018-5302 Report Generated at: 2019-03-07 13:05:46

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance Report Version: NRC-PRF-01-E-08022018-5302 Report Generated at: 2019-03-07 13:05:46

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance Report Version: NRC-PRF-01-E-08022018-5302 Report Generated at: 2019-03-07 13:05:46

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 5 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 6 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 7 of 20	

I. CERTIFICATE OF INSTALLATION, CERTIFICATE OF ACCEPTANCE & CERTIFICATE OF VERIFICATION SUMMARY (NRC/INCA/NRCV) - Documentation Author to indicate which Certificates must be submitted for the features to be recognized for compliance (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify). See Tables G, and H, in MCH and LTI Details Sections for Acceptance Tests and forms by equipment.						
Building Component	Compliance Forms (Required for submittal)	Pass	Fail			
Envelope	<input checked="" type="checkbox"/> NRC-ENV-01-E - For all buildings	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-ENV-02-F - NRC Label verification for fenestration	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-01-E - For all buildings with Mechanical Systems	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-02-A - Outdoor Air	<input type="checkbox"/>	<input type="checkbox"/>			
Plumbing	<input checked="" type="checkbox"/> NRC-MCH-03-A - Constant Volume Single Zone HVAC	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-04-H - Air Distribution Duct Leakage	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-05-A - Air Economizer Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-06-A - Demand Control Ventilation	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-07-A - Supply Fan Variable Flow Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-08-A - Valve Leakage Test	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-09-A - Supply Water Temp Reset Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-10-A - Hydronic System Variable Flow Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-11-A - Auto Demand Shed Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-12-A - Packaged Direct Expansion Units	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-13-A - Air Handling Units and Zone Terminal Units	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-14-A - Distributed Energy Storage	<input type="checkbox"/>	<input type="checkbox"/>			
Mechanical	<input checked="" type="checkbox"/> NRC-MCH-15-A - Thermal Energy Storage	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-16-A - Supply Air Temp Reset Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-17-A - Condensate Water Temp Reset Controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-MCH-18-A - Energy Management Controls Systems	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRCV-MCH-04-H - Duct Leakage Test	<input type="checkbox"/>	<input type="checkbox"/>			
	Indoor Lighting	<input checked="" type="checkbox"/> NRC-LTI-01-E - For all buildings	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-LTI-02-E - Lighting control system, or for an Energy Management Control System (EMCS)	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-LTI-03-E - Line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-LTI-04-E - Two interrelated systems serving an auditorium, a convention center, a conference room, or a theater	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-LTI-05-E - Lighting Control Credit Power Adjustment Factor (PFM)	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-LTI-06-E - Additional wattage installed in a video conferencing studio	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-LTI-07-E - Occupancy sensors and automatic time switching controls	<input type="checkbox"/>	<input type="checkbox"/>		
<input checked="" type="checkbox"/> NRC-LTI-08-A - Automatic daylighting controls		<input type="checkbox"/>	<input type="checkbox"/>			
<input checked="" type="checkbox"/> NRC-LTI-09-A - Demand responsive lighting controls		<input type="checkbox"/>	<input type="checkbox"/>			
<input checked="" type="checkbox"/> NRC-LTI-10-E - Outdoor Lighting		<input type="checkbox"/>	<input type="checkbox"/>			
<input checked="" type="checkbox"/> NRC-LTI-11-E - EMCS Lighting Control System		<input type="checkbox"/>	<input type="checkbox"/>			
<input checked="" type="checkbox"/> NRC-LTI-12-E - Sign Lighting		<input type="checkbox"/>	<input type="checkbox"/>			
Sign Lighting	<input checked="" type="checkbox"/> NRC-LTS-01-E - Sign Lighting	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-ELE-01-E - Electrical Power Distribution	<input type="checkbox"/>	<input type="checkbox"/>			
Electrical	<input checked="" type="checkbox"/> NRC-SPV-01-E - Photovoltaic Systems	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-SPV-01-E - Photovoltaic Systems	<input type="checkbox"/>	<input type="checkbox"/>			

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 6 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 7 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 8 of 20	

J. CERTIFICATE OF INSTALLATION, CERTIFICATE OF ACCEPTANCE & CERTIFICATE OF VERIFICATION SUMMARY (NRC/INCA/NRCV) - Documentation Author to indicate which Certificates must be submitted for the features to be recognized for compliance (Retain copies and verify forms are completed and signed to post in field for Field Inspector to verify). See Tables G, and H, in MCH and LTI Details Sections for Acceptance Tests and forms by equipment.						
Building Component	Compliance Forms (Required for submittal)	Pass	Fail			
Envelope	<input checked="" type="checkbox"/> NRC-ENV-01-E - For all buildings with Plumbing Systems	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-PLB-02-E - Required on central systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-PLB-03-E - Single dwelling unit systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-PLB-21-E - HERS verified central systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>			
Plumbing	<input checked="" type="checkbox"/> NRC-PLB-22-H - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRCV-PLB-04-H - HERS verified central systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRCV-PLB-22-H - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRCV-STH-01-E - Any solar water heating	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-01-E - For all buildings	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-02-E - Lighting control system, or for an Energy Management Control System (EMCS)	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-03-E - Line-voltage track lighting integral current limiter, or for a supplementary overcurrent protection panel used to energize only line-voltage track lighting	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-04-E - Two interrelated systems serving an auditorium, a convention center, a conference room, or a theater	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-05-E - Lighting Control Credit Power Adjustment Factor (PFM)	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-06-E - Additional wattage installed in a video conferencing studio	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-07-E - Occupancy sensors and automatic time switching controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-08-A - Automatic daylighting controls	<input type="checkbox"/>	<input type="checkbox"/>			
Indoor Lighting	<input checked="" type="checkbox"/> NRC-LTI-09-A - Demand responsive lighting controls	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-10-E - Outdoor Lighting	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-11-E - EMCS Lighting Control System	<input type="checkbox"/>	<input type="checkbox"/>			
	<input checked="" type="checkbox"/> NRC-LTI-12-E - Sign Lighting	<input type="checkbox"/>	<input type="checkbox"/>			
	Sign Lighting	<input checked="" type="checkbox"/> NRC-LTS-01-E - Sign Lighting	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-ELE-01-E - Electrical Power Distribution	<input type="checkbox"/>	<input type="checkbox"/>		
	Electrical	<input checked="" type="checkbox"/> NRC-SPV-01-E - Photovoltaic Systems	<input type="checkbox"/>	<input type="checkbox"/>		
		<input checked="" type="checkbox"/> NRC-SPV-01-E - Photovoltaic Systems	<input type="checkbox"/>	<input type="checkbox"/>		

CA Building Energy Efficiency Standards - 2016 Nonresidential Compliance Report Version: NRC-PRF-01-E-08022018-5302 Report Generated at: 2019-03-07 13:05:46

Project Name: Lazy Dog Restaurant - Montclair		NRC-PRF-01-E		Page 7 of 20	
Project Address: 5200 Montclair Plaza Lane Montclair 91763		Calculation Date/Time: 13:05, Thu, Mar 07, 2019		Page 8 of 20	
Compliance Scope: NewEnvelopeAndMechanical		Input File Name: LD-Montclair Title 24.cdb164		Page 9 of 20	

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	<input checked="" type="checkbox"/> NRC-PLB-03-E - Single dwelling unit systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>		
	<input checked="" type="checkbox"/> NRC-PLB-21-E - HERS verified central systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>	<input type="checkbox"/>		
Plumbing	<input checked="" type="checkbox"/> NRC-PLB-22-H - HERS verified single dwelling unit systems in high-rise residential, hotel/motel application.	<input type="checkbox"/>			

