

# MECHANICAL GENERAL NOTES

<p><b>A. GENERAL CONDITIONS</b></p> <ol style="list-style-type: none"><li>DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM STANDARD FOR THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND INSPECTIONS FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND INSPECTIONS FOR THIS PROJECT.</li><li>THE TERM "CONTRACTOR" SHALL MEAN THE "MECHANICAL CONTRACTOR HIRED TO COMPLETE THE WORK OUTLINED IN THESE PLANS AND SPECIFICATIONS", UNLESS OTHERWISE SPECIFIED.</li><li>THE CONTRACTOR FOR THIS WORK IS REQUIRED TO REVIEW ALL DRAWINGS FOR ALL OTHER TRADES.</li><li>THE GENERAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THEIR SUBCONTRACTORS WITH A FULL SET OF BID DOCUMENTS INCLUDING SPECIFICATIONS AND MUST COORDINATE ITS WORK AND INSPECTIONS OF THEIR SUBCONTRACTORS WITH ALL OTHER TRADES ON SITE TO CONFORM WITH THE GENERAL CONTRACTORS TIME SCHEDULE.</li><li>BY SUBMITTING A QUOTATION OR PROPOSAL, THE MECHANICAL CONTRACTOR EXPRESSLY STATES AND WARRANTS THAT ALL DRAWINGS AND SPECIFICATIONS HAVE BEEN THOROUGHLY REVIEWED AND THAT THIS CONTRACTOR HAS BECOME FAMILIARIZED WITH JOB SITE CONDITIONS AND IS TOTALLY QUALIFIED TO PERFORM ALL OF THE WORK REQUIRED.</li><li>BEFORE SUBMITTING A FINAL PROPOSAL, THE CONTRACTOR SHALL EXAMINE THE SITE OF THE PROPOSED WORK TO DETERMINE THE EXISTING CONDITIONS THAT MAY AFFECT THE PROPOSAL. IF DISCREPANCIES ARE NOTED BETWEEN THE DOCUMENTS AND THE EXISTING CONDITIONS, THE ARCHITECT SHALL BE NOTIFIED AND THE CONTRACTOR SHALL RECEIVE CLARIFICATION BEFORE SUBMITTING A BID. THE SUBMISSION OF A PROPOSAL SHALL INDICATE THAT ALL CHARGES AND COSTS MADE NECESSARY BY EXISTING CONDITIONS ARE INCLUDED AND THAT THE COMPLETE SYSTEM AS DESCRIBED HEREIN WILL BE FURNISHED AT THE PROPOSED COST.</li><li>THE HVAC SUBCONTRACTOR IS REQUIRED TO VISIT THE SITE DURING BIDDING AND VERIFY LOCATION(S) OF WHERE DUCTWORK IS INDICATED TO BE PLACED, THEIR ROUTES AND POSSIBLE INTERFERENCES WITH OTHER EQUIPMENTWORK (PLUMBING, SPRINKLER, ELECTRICAL, ETC.) TO BE INSTALLED AND/OR EXISTING TO REMAIN AND TO VERIFY HEIGHTS TO BE INSTALLED TO MAINTAIN DESIGNED CEILING HEIGHTS AND HEAD ROOM. ANY DISCREPANCIES BETWEEN DESIGNED AND ACTUAL ARE TO BE TOLD TO THE GENERAL CONTRACTOR AND BE INDICATED ON THE BID FORM.</li><li>WHEN USED, THE TERM "PROVIDED BY CONTRACTOR" SHALL BE INTERPRETED AS MEANING "FURNISHED AND INSTALLED BY CONTRACTOR" WITH THE EXCEPTION WHERE ITEMS ARE "PROVIDED BY TENANT" SHALL BE INTERPRETED AS MEANING "FURNISHED BY TENANT (INSTALLED BY CONTRACTOR)" EXCEPT WHERE NOTED OTHERWISE.</li></ol>	<p><b>L. TRADE NAMES AND MANUFACTURERS</b></p> <ol style="list-style-type: none"><li>WHERE TRADE NAMES AND MANUFACTURERS ARE USED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THE EXACT EQUIPMENT SHALL BE USED AS A MINIMUM STANDARD FOR THE WORK. BID MANUFACTURERS CONSIDERED AS AN EQUIVALENT OR BETTER IN ALL ASPECTS TO THAT SPECIFIED WILL BE SUBJECT TO REVIEW 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 CONTRACTORS EXPENSE.</li></ol> <p><b>J. RECORD DRAWINGS</b></p> <ol style="list-style-type: none"><li>THE CONTRACTOR SHALL MAINTAIN ONE COPY OF DRAWINGS AND SPECIFICATIONS ON THE JOB SITE TO RECORD DEVIATIONS FROM CONTRACT DRAWINGS, SUCH AS LOCATIONS OF CONCEALED PIPING VALVES AND DUCTS, REVISIONS, ADDENDUMS AND CHANGE ORDERS, SIGNIFICANT DEVIATIONS MADE NECESSARY BY FIELD CONDITIONS, APPROVED EQUIPMENT SUBSTITUTIONS AND CONTRACTORS COORDINATION WITH OTHER TRADES AND EXACT ROUTING OF ALL SANITARY AND DOMESTIC WATER PIPING UNDER FLOOR.</li><li>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 THE TENANT.</li></ol> <p><b>K. GUARANTEE WARRANTY</b></p> <ol style="list-style-type: none"><li>GUARANTEE THAT EACH PIECE OF APPARATUS SHALL BE OF THE CUSTOMARY STANDARD AND QUALITY FURNISHED BY THE DESIGNED MANUFACTURER FOR THAT CATALOG NUMBER.</li><li>GUARANTEE THAT THE AIR SYSTEMS SHALL OPERATE WITHOUT AERODYNAMIC NOISE GENERATED FROM THE FAULTY INSTALLATION OF DUCT WORK OR ANY COMPONENT OF THE AIR DISTRIBUTION SYSTEM.</li><li>GUARANTEE THAT ALL SYSTEMS AND COMPONENTS SHALL BE PROVIDED WITH A ONE YEAR WARRANTY FROM THE TIME OF DATE OF SUBSTANTIAL COMPLETION. THE WARRANTY SHALL COVER ALL MATERIALS AND WORKMANSHIP DURING THIS WARRANTY PERIOD. ALL DEFECTS IN MATERIALS AND WORKMANSHIP SHALL BE CORRECTED BY REPAIR OR REPLACEMENT WITHOUT INCURRING ADDITIONS TO THE CONTRACT.</li></ol> <p><b>L. OPERATIONS MANUALS</b></p> <ol style="list-style-type: none"><li>ONE COPY OF EACH OPERATION AND MAINTENANCE MANUAL FOR ALL EQUIPMENT FURNISHED ON THE JOB SHALL BE PROVIDED TO THE TENANT BOUND TOGETHER IN A 3 INCH, THREE RING BINDER. THE BINDER SHALL INCLUDE BUT NOT BE LIMITED TO INSTALLATION, MAINTENANCE AND OPERATING INSTRUCTIONS, PAMPHLETS OR BROCHURES, REVIEWED SHOP DRAWINGS AND WARRANTIES OBTAINED FROM EACH MANUFACTURER OF PRINCIPAL ITEMS OF EQUIPMENT.</li></ol>	<p>--SPECIFIC NOTES--</p> <p><b>A. HEATING, VENTILATION AND AIR CONDITIONING</b></p> <ol style="list-style-type: none"><li>BEFORE STARTING WORK, THIS CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO SEQUENCE, COORDINATE AND PRIOR TO ACCEPTANCE. THE USE OF ANY UNAUTHORIZED EQUIPMENT SHALL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTORS EXPENSE.</li></ol> <p><b>B. HVAC EQUIPMENT (REFER TO PLANS FOR SCHEDULE OF EQUIPMENT)</b></p> <ol style="list-style-type: none"><li>PRIMARY HVAC UNITS ARE TO BE AS SCHEDULED. EQUIVALENTS MAY BE SUBSTITUTED WITH WRITTEN APPROVAL ONLY.</li><li>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.</li><li>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 MANUFACTURER'S DATA. SEE DRAWINGS FOR ADDITIONAL DETAILS.</li><li>SECONDARY DRAIN PANS ARE REQUIRED TO BE INSTALLED BENEATH ALL INDOOR AIR CONDITIONING EQUIPMENT WITH THE EXCEPTION OF AIR TERMINAL BOXES. SECONDARY PANS ARE TO PROTECT ENTIRE UNIT. PROVIDE CONDENSATE PUMPS AS REQUIRED. CONDENSATE SHALL BE DIRECTED TO MOP SINK, LAVATORY TRAP OR OTHER APPROVED DRAIN.</li></ol> <p><b>C. TOILET EXHAUST FANS</b></p> <ol style="list-style-type: none"><li>WHERE SHOWN ON DRAWINGS PROVIDE A TOILET EXHAUST FAN COMPLETE WITH GRAVITY BREATHER DAMPER, ALL DUCTWORK, ROOF FLASHINGS AND CAPS NECESSARY TO PROVIDE COMPLETE EXHAUST SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR. REFER TO PLANS FOR APPLICABILITY.</li></ol> <p><b>D. VIBRATION ISOLATION DEVICES</b></p> <ol style="list-style-type: none"><li>VIBRATION ISOLATION DEVICES SHALL BE PROVIDED IN ALL SUPPORTS BETWEEN VIBRATING EQUIPMENT (FANS, ROOFTOP UNITS, WATER SOURCE HEAT PUMPS, AIR HANDLERS, FAN POWERED VAV BOXES, ETC.) AND STRUCTURE.</li><li>VIBRATING EQUIPMENT HUNG FROM STRUCTURE SHALL BE ISOLATED WITH RUBBER AND SPRING DEVICES. VIBRATING EQUIPMENT SUPPORTED FROM FLOOR OR DECK SHALL BE ISOLATED WITH HOUSED SPRING MOUNT DEVICES.</li><li>EXAMINE DEAD LOAD AND OPERATING LOAD CONDITIONS WHEN SELECTING DEVICES. ADJUST FOR PROPER ALIGNMENT AND LOADING. AVOID "GROUNDING" THE ISOLATOR.</li><li>CHECK HANGER ROD SIZE FOR ALLOWABLE LOADS AT THE ISOLATING DEVICE AND THE UPPER AND LOWER ATTACHMENTS TO STRUCTURES, DUCTS, EQUIPMENT, ETC.</li><li>CONSULT MANUFACTURER FOR APPLICATION DATA.</li></ol>	<ol style="list-style-type: none"><li>PROVIDE DUCT ACCESS DOORS IN AN ACCESSIBLE LOCATION FOR ALL FIRE DAMPERS. DOOR IS TO BE 20-GAUGE GALVANIZED DOOR WITH QUICK-OPENING LATCH AND PIANO HINGE.</li><li>WHERE REQUIRED BY LOCAL CODES, LANDLORD AND IF INDICATED ON DRAWINGS, PROVIDE UL565 SMOKE DAMPER WITH FIRE / HEAT / SMOKE SENSOR, REVERSIBLE MOTOR AND INTERLOCK WITH FIRE ALARM SYSTEM.</li></ol> <p><b>J. FLEXIBLE AIR DUCT</b></p> <ol style="list-style-type: none"><li>FLEXIBLE DUCT FOR CONNECTIONS SHALL BE A FACTORY FABRICATED ASSEMBLY CONSISTING OF AN INNER SLEEVE, INSULATION AND A FIBERGLASS BARRIER. THE INNER SLEEVE SHALL BE CONSTRUCTED OF A CONTINUOUS VINYL COATED SPRING STEEL WIRE HELIX FUSED TO A CONTINUOUS LAYER OF FIBERGLASS IMPREGNATED AND COATED VINYL. A 1-1/4" THICK LAYER OF INSULATING BLANKET OF FIBERGLASS WOOL SHALL ENCASE THE INNER SLEEVE AND BE SHEATHED WITH AN OUTER MOISTURE BARRIER OF A BIDIRECTIONAL REINFORCED METALIZED VAPOR BARRIER. THE FLEXIBLE DUCT SHALL BE RATED FOR A MAXIMUM WORKING VELOCITY OF 8000 FPM AND SHALL BE LISTED BY THE UNDERWRITERS LABORATORIES UNDER THEIR UL-181 STANDARDS AS A CLASS 1 DUCT AND SHALL COMPLY WITH NFPA STANDARD - 90A. THE FLEXIBLE DUCT SHALL BE TERMINATED BY UL APPROVED EQUIVALENT. FLEXIBLE DUCT SHALL ROUTE FROM SHEET METAL DUCTWORK TO CEILING DIFFUSERS ONLY. THERE SHALL BE NO EXPOSED FLEXIBLE DUCT.</li><li>FLEXIBLE AIR DUCT MAY ONLY BE USED IN VERTICAL APPLICATIONS WITH PRIOR APPROVAL FROM THE TENANT'S CONSTRUCTION MANAGER.</li><li>FLEXIBLE DUCT SHALL NOT EXCEED OVER 5 FEET IN LENGTH AT ANY ONE LOCATION.</li></ol> <p><b>K. SUPPLY AND RETURN AIR TAKEOFF FITTINGS</b></p> <ol style="list-style-type: none"><li>RECTANGULAR DUCT</li><li>PROVIDE 45-DEGREE RECTANGULAR TAKEOFFS FROM MAIN DUCTWORK TO RECTANGULAR BRANCHES.</li><li>SPIRAL DUCT</li><li>PROVIDE SADDLE OR DIRECT CONNECTION OF A BRANCH DUCT INTO A LARGER DUCT. THE DIAMETER OF THE BRANCH SHALL NOT EXCEED TWO THIRDS OF THE DIAMETER OF THE MAIN. PROTRUSIONS INTO THE MAIN ARE NOT ALLOWED.</li></ol> <p><b>L. DAMPERS</b></p> <ol style="list-style-type: none"><li>PROVIDE MANUAL LOCKING QUANTITY VOLUME CONTROL DAMPERS WITH HANDLE OPERATORS IN EACH BRANCH DUCT AND AS SHOWN ON PLANS TO FACILITATE AIR BALANCING.</li><li>WHERE ACCESS TO BALANCING DAMPER IS RESTRICTED OR IN AREAS WITH SHEET ROCK CEILINGS, YOUNG REGULATORS SHALL BE USED.</li><li>ALL RECTANGULAR DAMPERS IN OUTSIDE AIR AND RELIEF AIR DUCTS ARE TO BE OPPOSED BLADE TYPE WITH AN OUTSIDE METAL BLADE. ALL RECTANGULAR DAMPERS MUST ALSO BE OF THE LOW LEAKAGE TYPE.</li><li>ALL MOTORIZED DAMPERS NOT FURNISHED WITH EQUIPMENT ARE TO BE HONEYWELL DAMPERS.</li><li>PROVIDE FIRE OR FIRE/SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.</li></ol> <p><b>M. DIFFUSERS, GRILLES AND REGISTERS</b></p> <ol style="list-style-type: none"><li>PROVIDE DIFFUSERS, GRILLES AND REGISTERS AS SCHEDULED. DEVICES TO BE COMPLETE WITH FRAMES AND ALL ACCESSORIES. ALL DIFFUSERS, GRILLES AND REGISTERS IN SHEET ROCK CEILING TO BE PROVIDED WITH PLASTER FINISH. FINISH TO BE COORDINATED WITH INTERIOR FINISHES.</li><li>INSTALL ALL AIR DEVICES AS LOCATED ON THE ARCHITECTURAL REFLECTED CEILING PLAN OR THE MECHANICAL PLAN.</li></ol> <p><b>N. DUCTWORK INSULATION</b></p> <table border="1"><thead><tr><th>UNCONDITIONED SPACES WITHIN BUILDING:</th><th>SUPPLY</th><th>RETURN</th></tr></thead><tbody><tr><td>WITHIN BUILDING ENVELOPE ASSEMBLY:</td><td>R-8</td><td>R-8</td></tr><tr><td>OUTSIDE OF BUILDING:</td><td>R-8</td><td>R-8</td></tr></tbody></table> <ol style="list-style-type: none"><li>LEADING EDGES OF DUCT INSULATION SHALL BE OVERLAPPED BY ADJOINING INSULATION AT LEAST 6 INCHES MINIMUM AND THEN SEALED WITH FOIL VAPOR BARRIER ADHESIVE AND DUCT MASTIC SO THAT NO FIBERGLASS INSULATION IS VISIBLE.</li><li>ALL INSULATION ON EXISTING PIPING OR DUCTS THAT BECOMES WET, DAMAGED, DISTURBED OR GETS REMOVED SHALL BE REPLACED.</li><li>INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES. INSULATION MUST COMPLY WITH NFPA 90A.</li><li>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 TEST: C411 OR AS REQUIRED BY LOCAL CODES.</li></ol> <p><b>6. EXTERIOR SUPPLY AND RETURN DUCT INSULATION:</b></p> <p>A. SERVICE: RECTANGULAR, SUPPLY-AIR AND RETURN-AIR DUCTS.</p> <ol style="list-style-type: none"><li>MATERIAL: INSULATION BOARD, 6 PSF MINIMUM AND PLAIN FACING.</li><li>THICKNESS: 2 INCHES.</li><li>NUMBER OF LAYERS: TWO.</li><li>TOTAL THICKNESS = 4".</li><li>VAPOR RETARDER REQUIRED: YES.</li></ol> <p>B. INORGANIC GLASS FIBERS PREFORMED AND BONDED BY THERMOSETTING RESIN. MUST COMPLY WITH ASTM C 612, TYPE 1A &amp; 1B, KNAUF INSULATION OR APPROVED EQUIVALENT.</p> <p>C. INSULATION INSTALLED OUTDOORS: FLAME SPREAD RATING OF 25 OR LESS AND SMOKE DEVELOPED RATING OF 50 OR LESS.</p> <p>8. APPLY INSULATION AS FOLLOWS:</p> <ol style="list-style-type: none"><li>APPLY TWO-LAYER INSULATION WITH JOINTS TIGHTLY BUTTED AND STAGGERED AT LEAST 3 INCHES. SECURE LAYERS WITH ADHESIVE, MECHANICAL FASTENERS OR BANDING. FASTENERS SHALL BE LOCATED A MAXIMUM OF 3" FROM EACH EDGE AND NO GREATER THAN 12" APART.</li><li>ON EXPOSED APPLICATION, FINISH INSULATION WITH A SMOK COAT OF MINERAL-FIBER, HYDRAULIC-SETTING CEMENT TO SURFACE OF INSTALLED INSULATION. WHEN DRY, APPLY FLOOD COAT OF LAGGING ADHESIVE AND PRESS ON ONE LAYER OF GLASS CLOTH OR TAPE. OVERLAP EDGES AT LEAST 1 INCH (25 MM). APPLY FINISH COAT OF LAGGING ADHESIVE OVER GLASS CLOTH OR TAPE. THEN THE FINISH COAT TO ACHIEVE SMOOTH FINISH. OUTDOOR JACKET: POLYGUARD PRODUCTS, INC. 'ALUMAGUARD 60' OR MFM BUILDING PRODUCTS CORP. 'FLEXCLAD 400'.</li></ol>	UNCONDITIONED SPACES WITHIN BUILDING:	SUPPLY	RETURN	WITHIN BUILDING ENVELOPE ASSEMBLY:	R-8	R-8	OUTSIDE OF BUILDING:	R-8	R-8	<p><b>Q. FINAL HVAC INSPECTIONS</b></p> <ol style="list-style-type: none"><li>ASIDE FROM NORMAL INTERIM INSPECTIONS OF WORK IN PLACE, THE TENANT SHALL HAVE THE CONTRACTOR MAKE AN INDEPENDENT HVAC CONTRACTOR INSPECT THE FINISHED HVAC INSTALLATION UPON COMPLETION FOR COMPLIANCE WITH THE PLANS, SPECIFICATIONS AND CODES. THE INSTALLING CONTRACTOR WILL BE RESPONSIBLE TO BRING ALL ITEMS REPORTED BY THE INDEPENDENT HVAC CONTRACTOR UP TO PLANS AND SPECIFICATIONS REQUIREMENTS AT NO ADDITIONAL COST TO THE TENANT.</li></ol> <p><b>R. INDOOR AIR QUALITY</b></p> <ol style="list-style-type: none"><li>NO ANALYSIS HAS BEEN MADE WITH REGARD TO SOURCES OR POTENTIAL SOURCES OF INDOOR OR OUTDOOR AIR CONTAMINANTS OR LEVELS OF CONTAMINATION.</li><li>IT IS THE RESPONSIBILITY OF THE GENERAL AND MECHANICAL CONTRACTOR TO INFORM THE TENANT'S REPRESENTATIVE, LANDLORD AND TENANT'S ARCHITECT IF ANY SOURCE OR POTENTIAL SOURCE OF INDOOR AIR CONTAMINATION IS IDENTIFIED.</li><li>PRIOR TO ENCLOSING SPACES SUCH AS PLUMBING CHASES, AIR SHAFTS AND RETURN AIR PLENUMS CLEAN ALL AREAS THOROUGHLY. THE CONTRACTOR SHALL GUARANTEE THAT THE PLENUM CHAMBER USED FOR RE-CIRCULATING OF AIR WILL BE OF TIGHT CONSTRUCTION AND THAT ALL SOURCES OF CONTAMINATION FROM TRAPS, SOIL STACKS, DOWNSPOUTS, VENTS, EXHAUST DISCHARGES AND OTHER SOURCES WILL BE ENCLOSED SO THAT NO CONTAMINATED AIR WILL BE RE-CIRCULATED.</li><li>PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES SHUT OFF THE HVAC SYSTEM, BLOCK OFF ALL AIR GRILLS, DIFFUSERS AND OTHER OPENINGS OUTSIDE THE IMMEDIATE CONSTRUCTION AREA. OPENINGS TO ADJACENT TENANT SPACES SHALL BE COVERED WITH FILTER MEDIA TO PREVENT DUST AND OTHER AIRBORNE CONTAMINANTS FROM PASSING TO ADJOINING SPACES.</li><li>CONTRACTOR TO INSTALL TEMPORARY EXHAUST SYSTEM TO VENTILATE CONSTRUCTION SITE AND KEEP SITE UNDER SUFFICIENT PRESSURE DURING ALL HOURS OF CONSTRUCTION, EVEN IF AFTER NORMAL BUSINESS HOURS.</li><li>CONTRACTOR TO INSTALL TEMPORARY BARRIERS TO PROTECT ADJACENT SPACES FROM DUST, PARTICULATES AND VAPORS AND NOISE. WHERE TEMPORARY BARRIERS ARE INSTALLED ALWAYS MAINTAIN FIRE EXITS AND EXITWAYS.</li></ol> <p><b>THERMOSTATIC CONTROLS:</b></p> <p>A. GENERAL:</p> <p>THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY THE INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDITY CONTROL OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM. EXCEPTION:</p> <p>INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED:</p> <ol style="list-style-type: none"><li>THE PERIMETER SYSTEM INCLUDES AT LEAST ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).</li><li>THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THE THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.</li></ol> <p>B. DEAD BAND:</p> <p>WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEAD BAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.</p> <p>EXCEPTIONS:</p> <ol style="list-style-type: none"><li>THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.</li><li>OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.</li></ol> <p>C. OFF-HOUR CONTROLS:</p> <p>EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM. EXCEPTIONS:</p> <ol style="list-style-type: none"><li>ZONES THAT WILL BE OPERATED CONTINUOUSLY.</li><li>ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A READILY ACCESSIBLE MANUAL SHUT-OFF SWITCH.</li></ol> <p>D. AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES:</p> <p>AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATIONS TO BE SET FOR UP TO 2 HOURS. A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS, OR AN OCCUPANCY SENSOR.</p> <p>E. SETPOINT OVERLAP RESTRICTION:</p> <p>WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION DEADAND.</p> <p>F. AUTOMATIC START CAPABILITIES:</p> <p>AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY ADJUSTING THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.</p> <p>G. THERMOSTATIC SETBACK CAPABILITIES:</p> <p>THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).</p>
UNCONDITIONED SPACES WITHIN BUILDING:	SUPPLY	RETURN											
WITHIN BUILDING ENVELOPE ASSEMBLY:	R-8	R-8											
OUTSIDE OF BUILDING:	R-8	R-8											
<p><b>B. GENERAL REQUIREMENTS</b></p> <ol style="list-style-type: none"><li>THE MECHANICAL SUBCONTRACTORS QUOTING ON THEIR SPECIFIC SCOPE OF WORK/SERVICES TO CONTACT THE LOCAL BUILDING DEPARTMENT/AGENCY TO DISCUSS CODE ISSUES/IDIOSYNCRASIES REGARDING THEIR SERVICES AND THE QUOTE ASSOCIATED WITH THE SERVICES TO THE GENERAL CONTRACTOR FOR THIS PROJECT. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND INSPECTIONS FOR THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS, LICENSES, AND INSPECTIONS FOR THIS PROJECT.</li><li>THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE COMPLETE AND FULLY FUNCTIONAL MECHANICAL SYSTEMS AS CALLED FOR IN THE SPECIFICATIONS (IF SUPPLIED) 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 ENTIRE INSTALLATION WITH LANDLORD AS REQUIRED. FIELD VERIFY THE EXACT TYPE, SIZE, LOCATION, REQUIREMENTS, ETC. OF EXISTING EQUIPMENT, PIPE AND DUCTS SERVING THE TENANT SPACE PRIOR TO SUBMISSION OF BID.</li><li>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 NECESSARY TO COMPLETE THE WORK OR WHICH IS USUALLY INCLUDED IN WORK OF SIMILAR CHARACTER, SHALL BE PROVIDED AS PART OF THE CONTRACT.</li><li>WHERE THE DRAWINGS AND / OR SPECIFICATIONS CALL FOR ITEMS THAT EXCEED CODES OR THE LANDLORD'S TENANT CRITERIA, THE CONTRACTOR IS STILL RESPONSIBLE FOR PROVIDING THE SYSTEM AS DESIGNED AND DESCRIBED ON THE DRAWINGS, UNLESS SPECIFICALLY NOTED OTHERWISE.</li></ol> <p><b>C. CODES</b></p> <ol style="list-style-type: none"><li>ALL WORK SHALL BE PERFORMED IN A NEAT AND PROFESSIONAL MANNER USING GOOD CONSTRUCTION PRACTICES. ALL WORK SHALL CONFORM TO THE LATEST ADOPTED EDITION OF THE LANDLORD'S CRITERIA, THE STATE, COUNTY AND LOCAL CODES AND ORDINANCES, THE LATEST EDITIONS OF ASHRAE STANDARDS, THE LIFE SAFETY CODE, THE APPLICABLE BUILDING CODE, UNDERWRITERS LABORATORIES, THE NATIONAL ELECTRICAL CODE, NFPA 70, 90A, AND 96, AND ALL OTHER APPLICABLE CODES ENFORCED BY AUTHORITIES HAVING JURISDICTION, THE CHANGES REQUIRED BY ANY APPLICABLE CODES SHALL BE INCLUDED IN THE BID. AFTER THE CONTRACT IS ISSUED, NO ADDITIONAL COST DUE TO CODE ISSUES SHALL BE REIMBURSED BY THE TENANT TO THE CONTRACTOR.</li></ol> <p><b>D. LICENSES, PERMITS, INSPECTIONS AND FEES</b></p> <ol style="list-style-type: none"><li>THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS AND FEES REQUIRED OR RELATED TO THIS WORK.</li><li>FURNISH TO THE TENANT'S CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.</li></ol>	<p><b>M. SLEEVES</b></p> <ol style="list-style-type: none"><li>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 SLEEVES THAT PENETRATE THE FLOOR, WHICH SHALL EXTEND 2 INCHES ABOVE THE FLOOR.</li><li>ALL SLEEVES AND OPENINGS THROUGH FIRE RATED WALLS AND / OR FLOORS SHALL BE FIRE SEALED WITH APPROVED SEALANTS RATED FOR THE APPLICATION SO AS TO MAINTAIN THE FIRE RATING OF THE ASSEMBLY. CONFORM TO THE U.L. ASSEMBLY RATINGS OF THE FLOOR OR WALL.</li><li>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 CEILINGS OR FOR CONCEALED VERTICAL PIPING, SLEEVES SHALL BE 22 GAUGE GALVANIZED STEEL MINIMUM.</li><li>DUCT SLEEVES SHALL BE MINIMUM 14 GAUGE STEEL.</li></ol> <p><b>N. HANGERS</b></p> <ol style="list-style-type: none"><li>HANGERS SHALL INCLUDE ALL MISCELLANEOUS STEEL SUCH AS ANGLE IRON, BANDS, C-CLAMPS WITH RETAINING CLIPS, CHANNELS, HANGER RODS, ETC. NECESSARY FOR THE INSTALLATION OF WORK.</li><li>HANGERS SHALL BE FASTENED TO BUILDING STEEL, CONCRETE, OR MASONRY, BUT NOT TO PIPING OR DUCTWORK. DUCTWORK SHALL NOT BE SUPPORTED FROM ROOF DECKING AND/OR BRIDGING, BUT SHALL BE SUPPORTED FROM THE TOP CHORD OF BAR JOISTS, STEEL OR OTHER STRUCTURE. DUCTWORK SHALL CLEAR ALL SPRINKLERS AND OTHER OBSTACLES AND SHALL BE HUNG AS HIGH AS POSSIBLE IN WORK AND STORAGE AREAS. WHERE INTERFERENCES OCCUR, IN ORDER TO SUPPORT DUCTWORK OR PIPING, THE CONTRACTOR MUST USE TYPES AND INTERVALS OF HANGERS AND JOINT TYPES AND INTERVALS. ALL SQUARE ELBOWS SHALL BE PROVIDED WITH DOUBLE WALLED VANES ON MAXIMUM 3" CENTERS. PROVIDE SPLIT CLASS "C" ON ALL TRAVERSE JOINTS UNLESS SUPERSEDED BY MORE STRINGENT LOCAL CODES. ALL DUCT CONNECTIONS ARE TO BE RIGID AND LEAK FREE ASSEMBLIES.</li><li>DURING THE CONSTRUCTION PHASE OF THE PROJECT, ANY DUCTWORK INSTALLED IS TO BE COMPLETELY SEALED UP OF ANY OPENINGS, EITHER AT THE BEGINNING OR END OF A DUCT RUN OR AT A BRANCH, COLLAR DIFFUSERS OR REGISTER TO AVOID DIRT OR OTHER CONTAMINANTS FROM ENTERING THE SYSTEM.</li><li>EXCEPT WHERE OTHERWISE INDICATED, CONSTRUCT DUCT SYSTEMS TO 2-INCH WATER GAUGE PRESSURE CLASSIFICATION (VERIFY WHETHER RETURN OR EXHAUST DUCT IS POSITIVE OR NEGATIVE PRESSURE). PRESSURE TEST DUCTS FOR LEAKAGE. REPAIR LEAKING JOINTS AND APPLY SEALANTS AS REQUIRED TO FABRICATE A SYSTEM THAT DOES NOT EXCEED 5 PERCENT LEAKAGE OR LESS AS STATED BY PRESSURE CLASS RATINGS IN SMACNA STANDARDS.</li><li>AS A MINIMUM, CROSSBREAK ALL FLAT SURFACES OR REINFORCE WITH A BEAD APPROXIMATELY 3/8 INCH WIDE BY 3/16 INCH DEEP OR 1/2 INCH CENTERS TO PREVENT VIBRATIONS.</li><li>INSTALL RIGID ROUND AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMACNA STANDARDS. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS. PROVIDE SWAY AND SEISMIC BRACING AS REQUIRED BY STATE AND LOCAL CODES OR BY LANDLORD.</li><li>WHERE DUCTS PASS THROUGH ROOFS, FLOORS AND FIRE RATED PARTITIONS, PROVIDE AS MINIMUM 1-1/2 INCH (38 MM) STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANNUAL SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CALKED WITH SILICONE SEALANT OR FIRE PROOFED AS REQUIRED BY THE ASSEMBLY FIRE RATING. CONTRACTOR TO PROVIDE FIRE OR COMBINATION FIRE / SMOKE DAMPERS AT EACH PENETRATION WHERE REQUIRED BY CODE.</li><li>ALL TRAVERSE JOINTS AND SEAMS IN SUPPLY AIR DUCT SHALL BE SEALED AIR-TIGHT WITH DAP CMC DUCT SEALER. JOINTS ALSO SHALL BE RIVETED OR CONNECTED WITH SHEET METAL SCREWS.</li><li>SOFT ELASTOMER BUTYL GASKETS WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS.</li><li>DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE.</li><li>PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, FIRE / SMOKE DAMPERS, CONTROLS AND OTHER ITEMS 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. LAY-IN SUPPLY AND RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH PLASTER FINISHES MAY BE USED AS ACCESS LOCATIONS.</li><li>ALL BRANCHES AND TAKEOFFS SHALL BE EQUIPPED WITH MANUAL VOLUME CONTROLLING DEVICES HAVING AN INDICATING AND LOCKING DEVICE.</li><li>DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.</li></ol>	<p><b>E. CURBS AND STEEL FRAMING FOR SUPPORT</b></p> <ol style="list-style-type: none"><li>THIS CONTRACTOR WILL PROVIDE ALL NECESSARY CURBS AND STEEL FRAMING REQUIRED TO INSTALL ALL HVAC EQUIPMENT. CURBS SHALL BE A MINIMUM OF 14 INCHES HIGH AND OF THE SAME MANUFACTURERS AS THE EQUIPMENT SUPPORTED. INSULATE UNDER THE COMPARTMENT SECTION TO PREVENT CONDENSATION. ALL CURBS MUST BE INSTALLED SO THAT THE TOP OF CURBS ARE "DEAD" LEVEL. ALL PENETRATIONS OF EXISTING STRUCTURE SHALL BE DONE IN ACCORDANCE WITH THE LANDLORD'S GUIDELINES AT THIS CONTRACTOR'S EXPENSE. ALL CONNECTIONS TO ROOF OR EQUIPMENT SHALL BE INSIDE THE CURB (CONDENSATE DRAIN, POWER WIRING, CONTROL WIRING, ETC.).</li></ol> <p><b>F. METAL DUCTWORK - NO FIBERGLASS DUCT ALLOWED</b></p> <ol style="list-style-type: none"><li>NO DUCTWORK SHALL BE FABRICATED PRIOR TO APPROVAL BY THE TENANT'S CONSTRUCTION MANAGER. ANY DEVIATION FROM DESIGN MUST BE APPROVED BY TENANT'S CONSTRUCTION MANAGER PRIOR TO FABRICATION OR INSTALLATION. ALL DUCT SHOWN AS ROUND ABOVE A CEILING SHALL BE LONGITUDINAL SEAM DUCT AND SPIRAL WHERE EXPOSED, OR AS SHOWN ON THE DRAWINGS.</li><li>ALL DUCTWORK SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH SMACNA LOW VELOCITY AND "HVAC DUCT CONSTRUCTION STANDARDS MANUAL", LATEST EDITION AND ASHRAE USING PRIME SHEETS OF GALVANIZED STEEL. CONFORM TO THE REQUIREMENTS IN THE REFERENCED STANDARD FOR METAL THICKNESS, REINFORCING TYPES AND INTERVALS AND JOINT TYPES AND INTERVALS. ALL SQUARE ELBOWS SHALL BE PROVIDED WITH DOUBLE WALLED VANES ON MAXIMUM 3" CENTERS. PROVIDE SPLIT CLASS "C" ON ALL TRAVERSE JOINTS UNLESS SUPERSEDED BY MORE STRINGENT LOCAL CODES. ALL DUCT CONNECTIONS ARE TO BE RIGID AND LEAK FREE ASSEMBLIES.</li><li>DURING THE CONSTRUCTION PHASE OF THE PROJECT, ANY DUCTWORK INSTALLED IS TO BE COMPLETELY SEALED UP OF ANY OPENINGS, EITHER AT THE BEGINNING OR END OF A DUCT RUN OR AT A BRANCH, COLLAR DIFFUSERS OR REGISTER TO AVOID DIRT OR OTHER CONTAMINANTS FROM ENTERING THE SYSTEM.</li><li>EXCEPT WHERE OTHERWISE INDICATED, CONSTRUCT DUCT SYSTEMS TO 2-INCH WATER GAUGE PRESSURE CLASSIFICATION (VERIFY WHETHER RETURN OR EXHAUST DUCT IS POSITIVE OR NEGATIVE PRESSURE). PRESSURE TEST DUCTS FOR LEAKAGE. REPAIR LEAKING JOINTS AND APPLY SEALANTS AS REQUIRED TO FABRICATE A SYSTEM THAT DOES NOT EXCEED 5 PERCENT LEAKAGE OR LESS AS STATED BY PRESSURE CLASS RATINGS IN SMACNA STANDARDS.</li><li>AS A MINIMUM, CROSSBREAK ALL FLAT SURFACES OR REINFORCE WITH A BEAD APPROXIMATELY 3/8 INCH WIDE BY 3/16 INCH DEEP OR 1/2 INCH CENTERS TO PREVENT VIBRATIONS.</li><li>INSTALL RIGID ROUND AND RECTANGULAR METAL DUCT WITH SUPPORT SYSTEMS INDICATED IN SMACNA STANDARDS. NO WOOD SHALL BE USED TO SUPPORT OR BRACE DUCTS. PROVIDE SWAY AND SEISMIC BRACING AS REQUIRED BY STATE AND LOCAL CODES OR BY LANDLORD.</li><li>WHERE DUCTS PASS THROUGH ROOFS, FLOORS AND FIRE RATED PARTITIONS, PROVIDE AS MINIMUM 1-1/2 INCH (38 MM) STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANNUAL SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CALKED WITH SILICONE SEALANT OR FIRE PROOFED AS REQUIRED BY THE ASSEMBLY FIRE RATING. CONTRACTOR TO PROVIDE FIRE OR COMBINATION FIRE / SMOKE DAMPERS AT EACH PENETRATION WHERE REQUIRED BY CODE.</li><li>ALL TRAVERSE JOINTS AND SEAMS IN SUPPLY AIR DUCT SHALL BE SEALED AIR-TIGHT WITH DAP CMC DUCT SEALER. JOINTS ALSO SHALL BE RIVETED OR CONNECTED WITH SHEET METAL SCREWS.</li><li>SOFT ELASTOMER BUTYL GASKETS WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS.</li><li>DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE.</li><li>PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, FIRE / SMOKE DAMPERS, CONTROLS AND OTHER ITEMS 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. LAY-IN SUPPLY AND RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH PLASTER FINISHES MAY BE USED AS ACCESS LOCATIONS.</li><li>ALL BRANCHES AND TAKEOFFS SHALL BE EQUIPPED WITH MANUAL VOLUME CONTROLLING DEVICES HAVING AN INDICATING AND LOCKING DEVICE.</li><li>DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.</li></ol>	<p><b>O. ACCESS DOORS</b></p> <ol style="list-style-type: none"><li>FURNISH STEEL ACCESS DOORS AND FRAMES, MINIMUM 16 INCHES BY 20 INCHES OR AS REQUIRED FOR ADEQUATE ACCESS TO THE GENERAL CONTRACTOR FOR ALL LOCATIONS WHERE NECESSARY TO PROVIDE ACCESS TO CONCEALED VALVES AND OTHER EQUIPMENT REQUIRING SERVICE OR INSPECTION. LOCATION, TYPE, SIZE AND NUMBER WILL BE DETERMINED BY THE CONTRACTOR AND APPROVED BY THE TENANT CONSTRUCTION MANAGER TO SUIT EQUIPMENT REQUIREMENTS. GENERAL CONTRACTOR WILL INSTALL ACCESS DOORS AND FRAMES.</li><li>ACCESS DOORS LOCATED IN FIRE-RATED WALLS, FLOORS, CEILING-FLOOR, OR CEILING-ROOF ASSEMBLIES SHALL BE FIRE RATED, U.L. LISTED AND LABELED.</li><li>ACCESS DOORS SHALL BE FLUSH TYPE, MANUFACTURED FROM 14 GAUGE STEEL, COMPLETE WITH FLUSH FLANGE TYPE FRAMES MANUFACTURED FROM 16 GAUGE STEEL, PROVIDED WITH ANCHORS. ACCESS DOORS SHALL BE SUITABLE FOR INSTALLATION IN WALL OR CEILING MATERIALS SHOWN IN ROOM FINISH SCHEDULES. PROVIDE ACCESS DOORS FOR ALL CONCEALED VALVES, VENTS, DAMPERS, FIRE DAMPERS, EXPANSION JOINTS, PULL BOXES, SHOCK ABSORBERS, DRAINS, MOTORS, FANS, PUMPS AND ANY OTHER ITEM REQUIRING SERVICE. DOORS IN PLASTER OR CONCRETE SURFACES SHALL HAVE A RECESSED DOOR WITH CONCRETE OR PLASTER FACING. DOORS IN CARPETED OR TILED AREAS SHALL BE RECESSED WITH TILE FACING. NO ACCESS DOORS ARE REQUIRED IN 2' X 2' AND 2' X 4' LAY-IN ACOUSTIC TILE CEILING. PROVIDE COLORED PINE TO DENOTE ACCESS TILES. FURNISH FACTORY MADE METAL ACCESS DOORS, COMPLETELY FLUSH, "ALLAN HEAD" SCREWDRIVER OPERATED, WITH FRAMES AND CAM-TYPE CATCH WITH STAINLESS STEEL STUD. DOORS SHALL BE NOT LESS THAN 1" FOR HAND ACCESS. DOORS IN WALLS AND CEILING SHALL BE PRIME COATED CARBON STEEL. FURNISH FIRE RATED DOORS FOR FIRE RATED CONSTRUCTION. RATING OF DOOR MUST BE SAME RATING AS CONSTRUCTION.</li></ol> <p><b>P. ELECTRIC MOTORS</b></p> <ol style="list-style-type: none"><li>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 SPECIFICATIONS.</li><li>DESIGN, CONSTRUCTION AND PERFORMANCE CHARACTERISTICS OF MOTORS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF LATEST NEMA ANSI, IEEE STANDARDS FOR ELECTRICAL EQUIPMENT. ALL MOTORS SHALL BE SUPPLIED ON AN OVERSPEED PROTECTION OF 115 PERCENT TO 120 PERCENT, 40 DEGREES C AMBIENT TEMPERATURE AND HAVE A SERVICE FACTOR OF NOT LESS THAN 1.15.</li></ol> <p><b>Q. LOW VOLTAGE (24 VOLT) WIRING</b></p> <ol style="list-style-type: none"><li>THE CONTRACTOR IS TO INSTALL ALL LOW VOLTAGE WIRING REQUIRED FOR THEIR EQUIPMENT. THIS WORK INCLUDES ALL TRANSFORMERS AND DEVICES TO MAKE THIS A COMPLETE FUNCTIONAL SYSTEM.</li><li>ALL WORK IS TO CONFORM TO THE ELECTRICAL SPECIFICATIONS AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.</li><li>ANY CONDUIT REQUIRED BY CODE OR THE LANDLORD WILL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.</li><li>SMOKE DETECTORS AND REMOTE TEST STATION:</li></ol> <p>A. IONIZING TYPE ARE TO BE USED ON THE RETURN SIDE OF THE AHU AND PHOTO-TYPE ARE TO BE USED ON THE SUPPLY SIDE. ON ALL OTHER TYPES OF HVAC UNITS WHERE SMOKE DUCT DETECTORS ARE REQUIRED, USE FIELD INSTALLED IONIZING TYPE IN RETURN DUCTWORK AND PHOTO-TYPE ON THE SUPPLY, LOCATED BEFORE THE FIRST TAKEOFF. ONCE ACTIVATED, THE SMOKE DETECTOR WILL SHUT DOWN HVAC UNIT.</p> <p>B. SMOKE DETECTOR SHALL HAVE THEIR OWN REMOTE KEY TEST STATION SYSTEM WITH AUDIBLE AND VISUAL ALARM, SMOKE EX MODEL 498H/42 OR APPROVED EQUIVALENT. ALARM TO HAVE CANDELA SETTING OF 75 ANTI HIGH VOLUME HORN TONE SETTING.</p> <p>C. ALARM SYSTEM MAY BE DELETED WHERE NOT REQUIRED BY LANDLORD OR BY LOCAL CODE.</p>	<p><b>MARIETTA, GA BUILDING DEPARTMENT NOTES</b></p> <p>ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2018 IRC, AND ALL RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.</p> <ol style="list-style-type: none"><li>ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.</li><li>VENTILATION FOR ALL AREA SHALL COMPLY WITH 2018 IMC, CHAPTER 4.</li><li>AS PER C408.2.5 OF 2015 IECC, CONSTRUCTION DOCUMENT SHALL REQUIRE THAT, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION BE PROVIDED TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER.</li><li>AS PER C408.3.2 OF 2015 IECC, CONSTRUCTION DOCUMENT SHALL REQUIRE THAT AN OPERATING MANUAL AND A MAINTAINED MANUAL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.</li><li>TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2018 IRC, REQUIREMENTS AS OUTLINES IN SECTION.</li><li>THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.</li><li>TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF 2018 IMC CHAPTER 4: MECHANICAL VENTILATION - SECTION 403. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD: A. STANDARDS OF HEATING - 2018 IMC. B. DUCT CONSTRUCTION AND INSTALLATION-SECTION 403 OF 2018 IMC. C. AIR INTAKES, EXHAUSTS AND RELIEF-SECTION 401 OF 2018 IMC. D. AIR FILTERS-SECTION 605 OF 2018 IMC. E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS-SECTION 513 OF 2018 IMC. F. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT. G. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2018 IMC CHAPTER 4 SECTION 403.3. HVAC SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS AS REFERENCED IN SECTION 408.2.2. H. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION 606 2015 IMC. TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN. I. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION. J. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.</li></ol>									
<p><b>H. SHOP DRAWINGS</b></p> <ol style="list-style-type: none"><li>SUBMIT SHOP DRAWINGS FOR REVIEW. PDF FILES PREFERRED. SHOP DRAWINGS SHALL BE BOUND INTO VOLUMES (IF LESS), WITH EACH VOLUME (FILE) CONTAINING ONE COPY OF ALL SHOP DRAWINGS. ALL SHOP DRAWINGS SHALL BE SUBMITTED SIMULTANEOUSLY, NO SHOP DRAWINGS WILL BE CHECKED UNTIL ALL HAVE BEEN SUBMITTED.</li><li>SUBMITTALS SHALL BE SUPPORTED BY DESCRIPTIVE MATERIAL, SUCH AS CATALOG CUTS, DIAGRAMS, PERFORMANCE CURVES AND CHARTS PUBLISHED BY THE MANUFACTURER, TO SHOW CONFORMANCE TO SPECIFICATION AND DRAWING REQUIREMENTS. MODEL NUMBERS ALONE WILL NOT BE ACCEPTABLE. ALL LITERATURE SHALL CLEARLY INDICATE THE SPECIFIED MODEL NUMBER, DIMENSIONS, ARRANGEMENT, RATING AND CHARACTERISTICS OF THE EQUIPMENT. CAPACITIES AND RATINGS SHALL BE BASED ON CONDITIONS INDICATED OR SPECIFIED HEREIN. ANY DEVIATIONS FROM SPECIFIED EQUIPMENT (PARTICULARLY THOSE WHICH REQUIRE COORDINATION WITH OTHER TRADES) SHALL BE CLEARLY NOTED IN A CONCISE LIST ON A SEPARATE SHEET.</li></ol>	<p><b>G. DISCREPANCIES IN DOCUMENTS</b></p> <ol style="list-style-type: none"><li>DRAWINGS (PLANS, SPECIFICATIONS AND DETAILS) ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION AND INTENT OF THE MECHANICAL SYSTEMS. WHERE DRAWING, EXISTING SITE CONDITIONS, SPECIFICATIONS OR OTHER TRADES CONFLICT, THE CONTRACTOR SHALL 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 THE 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.</li></ol>	<p><b>G. FLEXIBLE CONNECTIONS</b></p> <ol style="list-style-type: none"><li>FLEXIBLE COLLARS SHALL BE PROVIDED IN ALL CONNECTIONS BETWEEN VIBRATING EQUIPMENT (FANS, ROOFTOP UNITS, WATER SOURCE HEAT PUMPS, AIR HANDLERS, FAN POWERED VAV BOXES, ETC.) AND STRUCTURE. ALSO PROVIDE FLEXIBLE CONNECTIONS WHERE DUCTS CROSS BUILDING EXPANSION JOINTS.</li><li>FLEXIBLE CONNECTIONS SHALL BE CONSTRUCTED OF NEOPRENE-COATED FLAMEPROOF FABRIC, PROVIDE ADEQUATE JOINT FLEXIBILITY TO ALLOW FOR MOVEMENT AND PREVENT THE TRANSMISSION OF VIBRATION.</li><li>FLEXIBLE CONNECTIONS ARE TO BE RATED FOR THE OPERATING PRESSURE OF THE SYSTEM.</li><li>FINAL CONNECTIONS TO EXHAUST FAN(S) SHALL BE WITH A HEAVY AIRTIGHT ACID RESISTANT FIRE RETARDANT FIBERGLASS NEOPRENE CONNECTOR, A MINIMUM OF SIX (6) INCHES IN LENGTH. THE CONNECTOR SHALL BE FASTENED TO EQUIPMENT AND DUCT WITH TWO FLEXIBLE REMOVABLE BRASS STRAPS OR ALTERNATE APPROVED METHOD.</li></ol> <p><b>H. THERMOSTATS</b></p> <ol style="list-style-type: none"><li>MOUNT THERMOSTATS 4'-0" (ADA COMPLIANT), THERMOSTAT SENSORS 5'-0" ABOVE FINISHED FLOORS, OR AS SHOWN ON THE PLANS, AND SET DATE, TIME, TEMPERATURE, ETC. TURN OVER OPERATING INSTRUCTIONS TO TENANT REPRESENTATIVE.</li></ol> <p><b>I. OPERATING SERVICES, SMOKE DAMPERS</b></p> <ol style="list-style-type: none"><li>THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL FIRE DAMPERS AS REQUIRED BY LANDLORD AND / OR TENANT CRITERIA AND / OR CODES HAVING JURISDICTION. ALL FIRE DAMPERS SHALL COMPLY WITH THE REQUIREMENTS OF THE BOARD OF FIRE UNDERWRITERS, THE LOCAL FIRE MARSHAL AND SHALL BE LABELED AND APPROVED BY UNDERWRITERS LABORATORIES.</li><li>FIRE DAMPERS SHALL HAVE THE BLADES OUT OF THE AIR STREAM AND A 165- DEGREE "F" FUSIBLE LINK.</li><li>PROVIDE ALL NECESSARY FRAMING AND SLEEVES FOR DAMPER MOUNTING PER UL AND CODE REQUIREMENTS.</li></ol>	<p><b>Q. SYSTEM CLEANOUT</b></p> <ol style="list-style-type: none"><li>UPON COMPLETION OF INSTALLATION, CLEAN ENTIRE SYSTEM BEFORE INSTALLING AIR OUTLETS. CONTRACTOR TO PROVIDE A CERTIFICATION THAT CLEANING WAS ACCOMPLISHED PRIOR TO PROJECT CLOSURE.</li><li>FILTERS MUST BE IN UNITS AT ANY TIME FANS ARE OPERATED.</li></ol> <p><b>P. SYSTEM TESTING, ADJUSTING AND BALANCING</b></p> <ol style="list-style-type: none"><li>THE CONTRACTOR SHALL RETAIN THE SERVICES OF AN INDEPENDENT TEST AND BALANCE AGENCY THAT IS INDEPENDENT OF ANY CONTRACTOR, SUB-CONTRACTOR, OR MANUFACTURER TO PERFORM THE TESTING AND BALANCING AND PREPARE REPORTS TO THE GENERAL CONTRACTOR. THE INDEPENDENT TEST AND BALANCE AGENCY SHALL BE A CERT</li></ol>										

GAS-FIRED PACKAGED ROOFTOP UNIT																			
TAG	SERVES	CFM	O.A. CFM	E.S.P.	COOLING					HEATING			ELECTRICAL			WEIGHT (LBS)	MANUFACTURER/ MODEL #	REMARK	
					NOM. TONS	TOTAL MBH	SENS. MBH	EER/IEER	SEER	ENT DB/WB	INPUT MBH	OUTPUT MBH	% EFF.	V/Ø/HZ	MCA (A)				MOCP (A)
(E)RTU-1	SEE PLANS	2000	460	SAE	5	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	LENNOX #LGH060S4TS4Y	-
(E)RTU-2	SEE PLANS	2000	460	SAE	5	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	LENNOX #LGH060S4TS4Y	-
(E)RTU-3	SEE PLANS	1600	350	SAE	4	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	LENNOX #LGH048S4TS4Y	-
(E)RTU-4	SEE PLANS	800	100	SAE	2	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	LENNOX #KGA024S4DS2P	-
(E)RTU-5	SEE PLANS	800	100	SAE	2	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	SAE	LENNOX #KGA024S4DS2P	-

NOTES :-  
1. SAE: SAME AS EXISTING. VIF: VERIFY IN FIELD.  
2. EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.  
3. CONTRACTOR TO CONFIRM IF EXISTING RTU IS WORKING AT ITS 100% RATED CAPACITY.  
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTU ON SITE.  
5. CONTRACTOR TO REBALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.  
6. REPLACE FILTERS, IF REQUIRED.

VENTILATION CALCULATION									
ROOM NAME	AREA (SF)	NUMBER OF PEOPLE/1000sq.ft AS PER IMC 2018	NUMBER OF PEOPLE IMC 2018	FINAL PEOPLE NO.	CFM AS PER IMC 2018		CALCULATED VENT CFM	PROVIDED OAI	TOILET EXHAUST
					CFM/PERSON	CFM/SQ.FT			
BREAKROOM	290	100	29	5	7.5	0.18	90	90	0
OFFICE	190	5	1	1	5	0.06	16	20	0
SALES AREA	5650	15	85	85	7.5	0.12	1316	1320	0
BOH	150	5	1	1	5	0.06	14	20	0
MEN RR	46	0	0	0	0	0	0	0	70
WOMEN RR	46	0	0	0	0	0	0	0	70
HALL	130	0	0	0	0	0.06	8	10	0
UTILITY	50	0	0	0	0	0.12	6	10	0
TOTAL							1449	1470	140

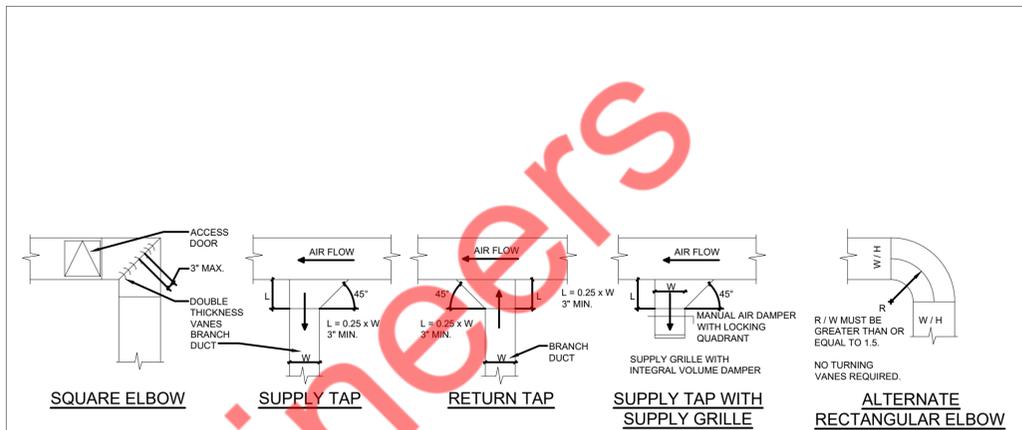
AIR BALANCE	
O.A.	1470
EXHAUST	140
BUILDING PRESSURE	1330

FAN SCHEDULE													
UNIT TAG	TYPE	LOCATION	MAKE AND MODEL	DESIGN CFM	E.S.P. (IN W.G.)	ELEC (W/Hz/Ph.)	MCA (A)	MOP (A)	FAN SPEED (RPM)	INLET dBA	WEIGHT (lb)	OPERATION	REMARK
(N)EF-2	CENTRIFUGAL	SEE PLANS	GREENHECK G-097-VG	200	0.5	115/60/1	4.8	15	1395	54	38	WITH TIME CLOCK	-

NOTES:  
1. COORDINATE WITH ARCH./G.C. ACCESS DOORS FOR SERVICING FAN IN HARD CEILING.  
2. FAN SPEED SHALL BE EASILY FIELD ADJUSTABLE.  
3. REFER TO DETAILS, FAN SHALL BE MOUNTED W/SUPPORT FRAMING BY OTHERS.  
4. PROVIDE MOTOR STARTERS, DISCONNECTS WITH NEMA-3R (IF NOT FACTORY PROVIDED). ALL EQUIPMENT NORMAL POWER WIRING BY ELECTRICAL CONTRACTOR. COORDINATE POWER REQUIREMENTS.  
5. PROVIDE SHEAR ISOLATION AND ALL-THREAD HANGING RODS FOR INLINE FANS.

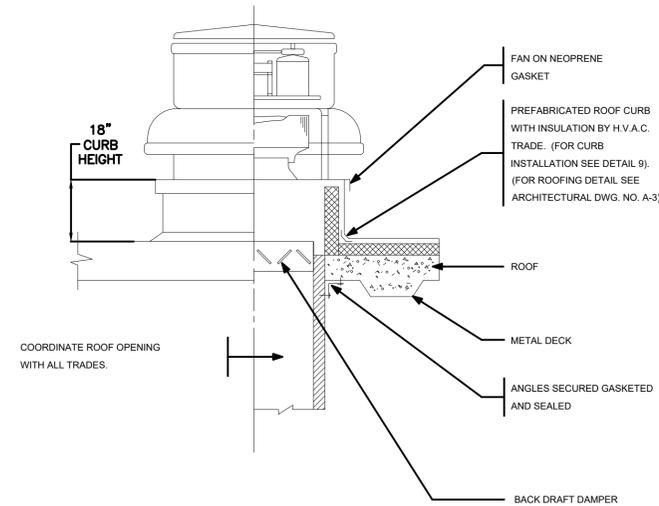
NEW DIFFUSER, REGISTER, AND GRILLE SCHEDULE					
TAG	MAKE & MODEL	DIFFUSER SIZE	NECK SIZE	CFM RANGE	DESCRIPTION
(N)RAD-1	TITUS TMS	24X24	Ø8	100-200	STEEL CONSTRUCTION, SURFACE OR LAY-IN MOUNT, ROUND NECK CEILING DIFFUSER WITH REMOVABLE CENTER CONE. PROVIDE SECTORIZING BAFFLE FOR AIRFLOW OTHER THAN 4-WAY BLOW.
(N)SG-1	TITUS 300FL	10X6	-	100-225	ALUMINUM CONSTRUCTION, SUPPLY AIR GRILLE WITH BLADES ON 3/4" CENTER, PARALLEL TO THE LONG DIMENSION AND SET AT 35 DEGREES. PROVIDE WITH BORDER SUITABLE FOR INSTALLATION. PROVIDE ROUND CONNECTION FITTING IF REQUIRED.
(N)SG-2	TITUS 300FL	18X8	-	260-480	ALUMINUM CONSTRUCTION, SUPPLY AIR GRILLE WITH BLADES ON 3/4" CENTER, PARALLEL TO THE LONG DIMENSION AND SET AT 35 DEGREES. PROVIDE WITH BORDER SUITABLE FOR INSTALLATION. PROVIDE ROUND CONNECTION FITTING IF REQUIRED.
(N)RG-1	TITUS 350RL	18X10	-	100-666	STEEL CONSTRUCTION RETURN GRILLE. INDIVIDUALLY ADJUSTABLE 3/4" BLADE SPACING SET AT 35 DEGREES. BLADES PARALLEL TO THE LONG DIMENSION. PROVIDE WITH OPPOSED BLADE DAMPER & BORDER TYPE MATCH FOR THE CEILING MOUNTING.
(N)RG-2	TITUS 350RL	10X6	-	50-200	STEEL CONSTRUCTION RETURN GRILLE. INDIVIDUALLY ADJUSTABLE 3/4" BLADE SPACING SET AT 35 DEGREES. BLADES PARALLEL TO THE LONG DIMENSION. PROVIDE WITH OPPOSED BLADE DAMPER & BORDER TYPE MATCH FOR THE CEILING MOUNTING.
(N)RG-3	TITUS 350RL	36X18	-	400-2200	STEEL CONSTRUCTION RETURN GRILLE. INDIVIDUALLY ADJUSTABLE 3/4" BLADE SPACING SET AT 35 DEGREES. BLADES PARALLEL TO THE LONG DIMENSION. PROVIDE WITH OPPOSED BLADE DAMPER & BORDER TYPE MATCH FOR THE CEILING MOUNTING.

1. COORDINATE FINAL ACCESSORIES, FINISHES, AND LENGTHS WITH CONSTRUCTION MANAGER & ARCHITECT PRIOR TO PROCUREMENT.  
2. SELECTION BASED ON TITUS OR APPROVED EQUIVALENT.



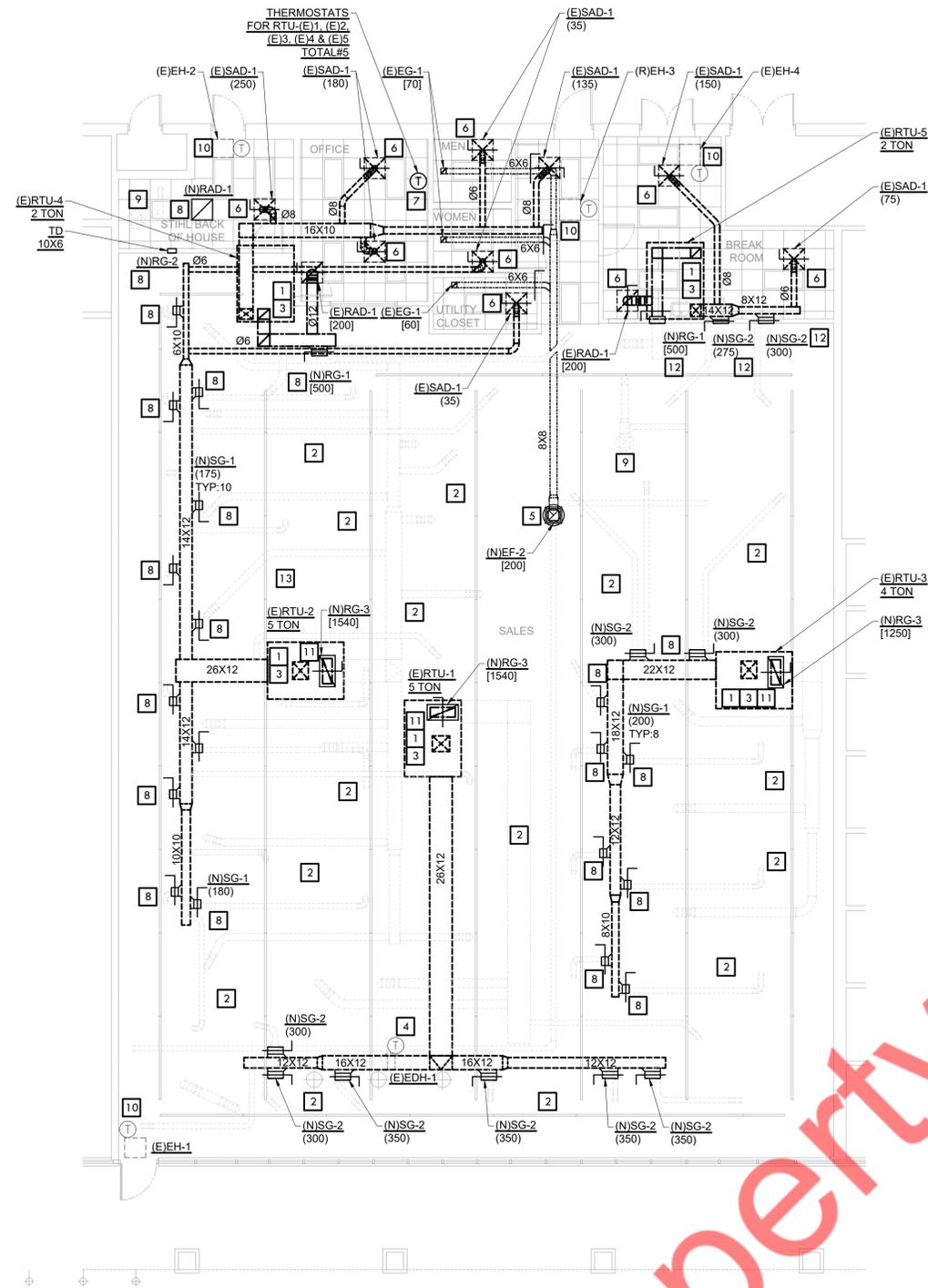
STANDARD DUCTWORK DETAILS

SCALE NTS 1



DOWNBLAST FAN

SCALE NTS 2



**MECHANICAL LEGEND**

	CEILING SUPPLY AIR DIFFUSER (SAD)		NEW FLEX DUCT
	CEILING SUPPLY AIR DIFFUSER WITH BLANK-OFF SECTION		VOLUME DAMPER
	DUCT MOUNTED GRILLE		VOLUME DAMPER W/ REMOTE OPERATOR
	EXHAUST FAN		TYPE OF AIR DEVICE
	WALL TRANSFER GRILLE (TG)		AIR QUANTITY (CFM)
	THERMOSTAT		X, INCHES, SIDE OF DUCT SHOWING
	TEMPERATURE SENSOR		MOTORIZED DAMPER
	NEW DUCTWORK		DUCT MOUNTED SMOKE DETECTOR
	EXISTING DUCT TO REMAIN		EXISTING
	GRAVITY DAMPER		RELOCATE
	FIELD CONNECTION		NEW
	DOOR UNDER CUT		SUPPLY AIR DUCT
			RETURN AIR DUCT
			EXHAUST AIR DUCT
			DEMOLITION

**MECHANICAL GENERAL NOTES**

- CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.
- NEW DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING, OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
- EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
- DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
- CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
- CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
- COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.
- MOUNT DUCTWORK AS HIGH AS POSSIBLE.
- TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
- PROVIDE R-8 INSULATION FOR SUPPLY AND RETURN DUCT INSIDE THE SPACE AND R-8 INSULATION FOR DUCTWORK OUTSIDE THE BUILDING.
- COORDINATE ALL EQUIPMENT WITH STRUCTURAL.
- PROVIDE FIRE OR FIRE-SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/ BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.
- PROVIDE CORD-OPERATED DAMPERS IN INACCESSIBLE CEILINGS.
- PROVIDE INTERNAL INSULATION FOR EXPOSE DUCTING AND EXTERNAL INSULATION FOR DUCTING IN CEILING SPACE.

**DEMOLITION NOTE**

IN SALES AREA EXISTING SUPPLY/RETURN SUB BRANCH DUCTWORK, RETURN MAIN DUCT & DIFFUSERS TO BE REMOVED AND SCRAPPED. EXISTING AHU-1 IN SALES AREA, CU-1 AT ROOF AND EF-1, 2 & 3 TO BE DEMOLISHED. CONTRACTOR TO COORDINATE WITH ARCHITECT PRIOR TO BID.

NOTE: SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS USED.

**KEY NOTES**

- EXISTING ROOF TOP UNIT TO REMAIN ALONG WITH ALL ASSOCIATED SUPPORTS, DUCTWORK, SENSORS, ACCESSORIES & DUCT DROP. CONTRACTOR SHALL CLEAN AND REFURBISH TO 'LIKE NEW' CONDITION. VERIFY EXACT LOCATION IN FIELD.
- CONTRACTOR TO REMOVE AND SCRAP EXISTING SUPPLY SUB-DUCT BRANCHES AND RETURN MAIN DUCT WITH SUB DUCT BRANCHES ALONG WITH AIR TERMINALS SERVING TO SALES AREA AT ITS ENTIRETY. CONTRACTOR TO FIELD VERIFY DUCT CONNECTIONS. ACOUSTICALLY LINE THE FIRST 10'-0" OF SUPPLY/RETURN DUCT. PROVIDE INSULATION AS PER SPECIFICATIONS AND LOCAL CODE. COORDINATE WITH ARCHITECT/CLIENT FOR ANY DISCREPANCIES.
- EXISTING TEMPERATURE SENSORS IN RETURN AIR DUCT TO BE RE-USED & REMAIN. CONTRACTOR TO VERIFY IN FIELD, REPLACE IN KINDS IF DAMAGED. COORDINATE WITH RTU MANUFACTURER FOR COMPATIBLE CONTROLS AS REQUIRED.
- EXISTING ELECTRIC DUCT HEATER TO REMAIN ALONG WITH ASSOCIATED SUPPORTS, CONTROLS AND SENSORS.
- REMOVE AND SCRAP EXISTING EF-2 FAN AND REPLACE WITH NEW TOILET EXHAUST FAN AS SHOWN ON PLAN AS PER SCHEDULE. REUSE EXISTING EF-2 FAN'S DUCT ROOF PENETRATION. CONTRACTOR TO VERIFY EXACT LOCATION, DISTANCE AND CONNECTION POINT IN FIELD. EXTEND/MODIFY THE DUCTWORK AS REQUIRED. ENSURE TERMINATION OF THE EXHAUST DUCT AT ROOF PROVIDED WITH GOOSENECK AND INSECT SCREEN AND MINIMUM 10' AWAY FROM ANY FRESH AIR INTAKE.
- EXISTING SUPPLY/RETURN DIFFUSER/GRILLE TO REMAIN ALONG WITH ALL ASSOCIATED SUPPORTS, DUCTWORK AND DAMPERS. CONTRACTOR SHALL CLEAN AND REFURBISH TO 'LIKE NEW' CONDITION. REPAIR/REPLACE DIFFUSER/GRILLE IF REQUIRED. COORDINATE FINAL LOCATION IN FIELD.
- EXISTING PROGRAMMABLE THERMOSTATS TO BE REUSE & RELOCATE. PROVIDE NEW LOCKING COVER FOR THE THERMOSTAT. COORDINATE LOCATION ON SITE WITH ARCHITECT / OWNER.
- PROVIDE NEW DUCT MOUNTED SUPPLY/RETURN GRILLES ALONG WITH VOLUME CONTROL DAMPER AS SHOWN ON PLAN. CONTRACTOR SHALL BALANCE CFM'S AS INDICATED ON PLAN. COORDINATE WITH ARCHITECT FOR FINAL COLOR, FINISH, FRAME, ETC.
- EXISTING EXHAUST FANS EF-1 AND EF-3 TO BE DEMOLISHED ALONG WITH ASSOCIATED SUPPORTS, DUCTWORK AND AIR TERMINAL. CONTRACTOR TO PATCH AND SEAL EXHAUST DUCT ROOF PENETRATIONS AS PER LOCAL CODE. COORDINATE WITH ARCHITECT PRIOR TO START OF WORK.
- EXISTING ELECTRIC HEATERS TO BE REMAIN/RELOCATE ALONG WITH ALL ASSOCIATED SUPPORTS, ACCESSORIES AND CONTROLS.
- PROVIDE NEW RETURN GRILLE WITH VOLUME CONTROL DAMPER AND BALANCE THE CFM AS SHOWN ON PLAN.
- PROVIDE NEW DUCT MOUNTED SUPPLY/RETURN GRILLES ALONG WITH AIR SCOOP DEVICE. CONTRACTOR SHALL BALANCE CFM'S AS INDICATED ON PLAN. COORDINATE WITH ARCHITECT FOR FINAL COLOR, FINISH, FRAME, ETC.
- REMOVE AND SCRAP EXISTING AHU-1 IN SALES AREA AND CU-1 AT ROOF ALONG WITH ALL ASSOCIATED PIPING AND SUPPORTS.

I. GENERAL REQUIREMENTS

- 1. GENERAL CONDITIONS: ALL CONDITIONS AND REQUIREMENTS UNDER THE "GENERAL CONDITIONS", THE "SUPPLEMENTARY GENERAL CONDITIONS", THE "SPECIAL CONDITIONS" SHALL BECOME A PART OF THIS SPECIFICATION, AND BIDDERS WILL EXAMINE ALL DRAWINGS AND READ ALL PARTS OF THE SPECIFICATIONS TO AVOID OMISSIONS, DUPLICATIONS AND TO INSURE COMPLETE EXECUTION OF ALL WORK FOR ELECTRICAL.
- 2. GENERAL: THE WORK UNDER THIS SECTION SHALL INCLUDE ALL LABOR, MATERIALS AND EQUIPMENT AND INCIDENTAL COSTS NECESSARY TO FURNISH AND INSTALL ALL ELECTRICAL WORK, EQUIPMENT, LAMPS, ETC. INDICATED ON THE DRAWINGS, AS SPECIFIED HEREIN, OR BOTH.
- A. THE ELECTRICAL SUBCONTRACTORS QUOTING ON THEIR SPECIFIC SCOPE OF WORK / SERVICES TO CONTACT THE LOCAL BUILDING DEPARTMENT / AGENCY TO DISCUSS CODE ISSUES / IDIOSYNCRASIES REGARDING THEIR SERVICES AND THE QUOTE ASSOCIATED WITH THE SERVICES TO THE GENERAL CONTRACTOR FOR THIS PROJECT. THIS CONTRACTOR TO BE FAMILIAR WITH THE SITE WHERE SUCH SERVICES / WORK WILL BE PERFORMED, THIS SPECIFIC USE AND THE IDIOSYNCRASIES ASSOCIATED WITH THE LIFE, SAFETY AND HEALTH ASSOCIATED WITH THIS WORK AND TO INDICATE ON THE QUOTE ANY ITEMS REQUIRED THAT ARE NOT NECESSARILY SHOWN ON THE DRAWINGS / SPECIFICATIONS.
- 3. THE TENANT'S GENERAL CONTRACTOR AND/OR HIS ELECTRICAL SUBCONTRACTOR IS TO VERIFY ALL EQUIPMENT SPECIFICATIONS AND REQUIREMENTS WITH THE TENANT OR THE TENANT'S CONSTRUCTION REPRESENTATIVE PRIOR TO START OF CONSTRUCTION. THIS CONTRACTOR TO VERIFY AMPERAGE AND VOLTAGE SPECIFICATIONS AND REQUIREMENTS (SERVICE AND PANEL SPECIFICATION) WITH THE ELECTRICAL SUBCONTRACTOR IN COORDINATION WITH EQUIPMENT SPECIFICATIONS FOR EQUIPMENT SUPPLIED BY THE TENANT, THE CONTRACTORS OR OTHER SOURCES (AS SPECIFIED BY THE ARCHITECT) AS A DOUBLE CHECK TO ASCERTAIN PROPER INSTALLATION OF EQUIPMENT AT THE CORRECT VOLTAGE/ AMPERAGE.
- A. THE ELECTRICAL SUBCONTRACTOR IS REQUIRED TO VISIT THE SITE DURING BIDDING AND VERIFY LOCATIONS OF WHERE THE ELECTRICAL EQUIPMENT/PIPING IS INDICATED TO BE PLACED, SIZE OF ANY EXISTING SERVICE AND WHAT IS INDICATED TO BE INSTALLED OR "EXISTING TO REMAIN" AND IF NEW SERVICE IS INDICATED, TO VERIFY IF DIFFERENT THAN THE DRAWINGS, SIZE OF FEEDER PIPES, REQUIRED DISTANCES AND POSSIBLE ADDITIONAL WORK REQUIRED AT THE ELECTRICAL DISTRIBUTIONS ROOM. ANY DISCREPANCIES BETWEEN DESIGNED AND ACTUAL TO BE TOLD TO THE GENERAL CONTRACTOR AND BE INDICATED ON THE BID FORM.
- 4. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVAL FROM THE BUILDING AND ELECTRICAL INSPECTORS FOR ALL CONCEALED WORK PRIOR TO CLOSING UP WALLS, FLOORS AND CEILINGS.
- 5. TENANT'S GENERAL CONTRACTOR SHALL BRING IN ALL ADDITIONAL SERVICES, ADEQUATE FOR TENANT'S NEEDS AS REQUIRED, INCLUDING BUT NOT LIMITED TO ELECTRIC, SPRINKLER, SOIL (WASTE), DOMESTIC WATER LINES, OUTSIDE TOILET EXHAUST AIR, FIRE ALARM, TELEPHONE AND DATA.
- 6. SCOPE: FURNISH LABOR, MATERIALS, TOOLS, EQUIPMENT, ETC., REQUIRED FOR A COMPLETE INSTALLATION OF ELECTRICAL SYSTEMS AND WORK, IN ACCORDANCE WITH LOCAL CODES AND GOVERNING BODIES HAVING JURISDICTION, AS SHOWN ON DRAWINGS, AND AS SPECIFIED, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
  - A. NEW SERVICE - TENANT'S CONTRACTOR IS TO REUSE EXISTING ELECTRICAL SERVICE OR CONDUIT ONLY; FURNISH AND INSTALL NEW ELECTRICAL SERVICE WIRE AND EXTEND BOTH CONDUIT AND WIRE TO POINT OF ALL NEW PANELS, TRANSFORMERS, WIREWAYS, TROUGHS, TIME CLOCKS, ETC. SINCE SPACE MAY OR MAY NOT BE MEASURED OR REVIEWED BY TENANT'S ARCHITECT, THE ACTUAL LOCATION OF SERVICE AND PANEL LOCATIONS MAY NOT BE KNOWN. THE ELECTRICAL SUBCONTRACTOR, IN REVIEW OF THE PREMISES, IS REQUIRED TO INSTALL PANELS IN LOCATION AS NOTED ON DRAWINGS AND MUST INCLUDE IN HIS BID ANY EXTENSION OF CONDUIT AND WIRE, NEW DISCONNECTS, RELOCATION OR INSTALLATION OF PANELS, TROUGHS, WIREWAYS, ETC. TO MAKE THE SYSTEM WHOLE AND TO UPGRADE AS NECESSARY TO MEET CODE REQUIREMENTS. INSTALL NEW SERVICE INCLUDING CONDUIT AND WIRE FROM DEMISED PREMISES TO LANDLORD'S ELECTRICAL ROOM IF THE EXISTING SERVICE NEEDS TO BE UPGRADED FROM WHAT TENANT WAS ORIGINALLY TOLD SERVICE WOULD BE, OR THE SERVICE NEEDS TO BE MOVED BECAUSE IT'S EITHER SHOWN TO BE MOVED OR IS EXISTING NOW IN THE PATH OF FUTURE PARTITION OR OTHER SERVICES.
  - B. EXISTING SERVICE - TENANT'S CONTRACTOR IS TO REUSE EXISTING ELECTRICAL SERVICE WIRE, CONDUIT AND ELECTRICAL EQUIPMENT; CUT AND EXTEND TO POINT OF NEW ELECTRICAL EQUIPMENT. ALL EXISTING ELECTRICAL EQUIPMENT WHICH IS REUSED TO BE BROUGHT UP TO "LIKE NEW" CONDITION AND THE LATEST N.E.C. STANDARD. SINCE SPACE MAY OR MAY NOT BE MEASURED OR REVIEWED BY TENANT'S ARCHITECT, THE ACTUAL LOCATION OF SERVICE AND PANEL LOCATIONS MAY NOT BE KNOWN. THE ELECTRICAL SUBCONTRACTOR, IN REVIEW OF THE PREMISES IS REQUIRED TO INSTALL PANELS IN LOCATION AS NOTED ON DRAWINGS AND MUST INCLUDE IN HIS BID ANY EXTENSION OF CONDUIT AND WIRE, NEW DISCONNECTS, RELOCATION OR INSTALLATION OF PANELS, TROUGHS, WIREWAYS, ETC. TO MAKE SYSTEM WHOLE AND TO UPGRADE AS NECESSARY TO MEET CODE REQUIREMENTS. INSTALL NEW SERVICE INCLUDING CONDUIT AND WIRE FROM DEMISED PREMISES TO LANDLORD'S ELECTRICAL ROOM IF THE EXISTING SERVICE NEEDS TO BE UPGRADED FROM WHAT TENANT WAS ORIGINALLY TOLD SERVICE WOULD BE, OR THE SERVICE NEEDS TO BE MOVED BECAUSE IT'S EITHER SHOWN TO BE MOVED OR IS EXISTING NOW IN THE PATH OF FUTURE PARTITION OR OTHER SERVICES. IF SERVICE IS ADEQUATE BUT MUST BE RELOCATED, CUT AND EXTEND EXISTING WIRE AND CONDUIT TO POINT OF ALL NEW PANELS, DISCONNECTS, TROUGHS, TIME CLOCKS, ETC.
  - C. POWER DISTRIBUTION SYSTEMS AND TRANSFORMER.
  - D. LIGHTING SYSTEMS (ALSO SEE REFLECTED CEILING PLAN).
  - E. ELECTRICAL ENERGIZING - MISCELLANEOUS FAN AND MOTOR.
  - F. MOTOR POWER WIRING SYSTEM.
  - G. TELEPHONE EMPTY CONDUIT SYSTEM (INCLUDING TERMINAL BOXES AND OUTLETS).
  - H. CONVENIENCE RECEPTACLE SYSTEM, DOOR ALARM/ ENTRY SYSTEM/ SECURITY.
  - I. SOUND SYSTEM, INTERCOM SYSTEM - FURNISHED AND INSTALLED BY THIS CONTRACTOR IF REQUIRED BY CLIENT; EMERGENCY LIGHT SYSTEM AND BATTERIES FURNISHED BY CLIENT AND INSTALLED BY THIS CONTRACTOR.
  - J. GROUNDING IN ACCORDANCE WITH NATIONAL ELECTRIC CODE AND ALL MALL REQUIREMENTS.
  - K. NIGHT LIGHT CIRCUITING THROUGHOUT PREMISES AS PER CODE WHETHER SHOWN OR NOT ON DRAWINGS.
  - L. LOCK OUTS FOR EXIT / EMERGENCY LIGHTING, ALARM SYSTEMS, CASH REGISTERS, GRILLE AT ENTRY (IF APPLICABLE) AS REQUIRED. SEE PANEL SCHEDULE FOR CIRCUITS.
  - M. SMOKE DETECTORS FURNISHED AND INSTALLED WITHIN STORE TO INCLUDE LOCATIONS AND INTERNAL / EXTERNAL WIRING IF REQUIRED BY LANDLORD OR FIRE MARSHAL.
  - N. ELECTRICAL SUBCONTRACTOR, WHEN BIDDING THIS WORK, TO CHECK TO MAKE SURE THAT SERVICE WIRE, CONDUIT, DISCONNECTS, ETC., ARE ADEQUATE FOR TENANT'S NEEDS. IF ADDITIONAL SERVICE IS REQUIRED, INCLUDE NEW CONDUIT AND SERVICE FEED OR DISCONNECTS, METER BASE AND METER (IF APPLICABLE), ETC., TO BRING SUCH SERVICE UP TO TENANT'S NEEDS.
  - O. FURNISH AND INSTALL ALL CONDUIT AND WIRING, DISCONNECTS, BREAKERS, BALANCING OF LOADS, ETC. FOR HOOKUP OF ALL H.V.A.C. EQUIPMENT, UNIT(S), OR INLINE HEATERS WHETHER SUCH HEATERS OR EQUIPMENT / UNITS ARE SHOWN OR NOT.
  - P. FURNISH AND INSTALL A TWENTY FOUR (24) HOUR, SEVEN (7) DAY TIME CLOCK INCLUDING ALL INTEGRAL WIRING AND LOAD BALANCING (PANEL) FOR CONTROLLING THE STOREFRONT SIGN AND SHOW WINDOW LIGHTING, WHETHER SUCH WORK IS OR IS NOT SHOWN ON PLANS / OR SPECIFICATIONS.
  - Q. ALL ELECTRICAL ROUGH-IN TO BE NEW AND THE ORIGINAL SERVICES TO THE DEMISED PREMISES TO BE REUSED; CUT AND EXTEND TO POINT OF ALL NEW ELECTRICAL EQUIPMENT (IF ANY EQUIPMENT IS REUSED, UPGRADE SAME TO "LIKE NEW" CONDITION AND THE LATEST N.E.C. STANDARDS) BY THE TENANT'S CONTRACTOR UNLESS NOTED OTHERWISE ON DRAWINGS. TENANT'S GENERAL CONTRACTOR TO FIELD VERIFY THAT ALL UTILITY LINES ARE AT OR ADJACENT TO TENANT'S SPACE AS NOTED AND AT THE SIZE SPECIFIED. IF THE UTILITIES ARE NOT IN LOCATIONS AS NOTED ON THE DRAWINGS OR OF A SIZE LARGER OR SMALLER THAN NOTED, THIS

CONTRACTOR IS TO NOTIFY THE TENANT'S ARCHITECT IMMEDIATELY.

- R. THE TENANT'S ELECTRICAL SUBCONTRACTOR IS TO PROVIDE A NEW CIRCUIT DIRECTORY(IES) WITH PROPER PHASING AND BALANCING, WHICH IS TO CONFORM TO THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND UNDERWRITER'S CODE.
- S. THE SIGN(S) JUNCTION BOX PERMIT IS TO BE INCLUDED IN THE WORK FOR THE ELECTRICAL SUBCONTRACTOR AND THE BOX IS TO BE SUPPLIED BY THIS CONTRACTOR AND PROPERLY LABELED.
- T. FURNISH AND INSTALL NEW (OR REFURBISH IF EXISTING) TOILET EXHAUST WITH ASSOCIATED DUCTWORK, ROOF PENETRATIONS, OR HOOK UP TO COMMON EXHAUST DUCT WITH BACKDRAFT DAMPER ETC., INCLUDING ASSOCIATED ELECTRICAL HOOKUP AND PANEL CONNECTIONS, WHETHER SUCH WORK IS SHOWN OR NOT SHOWN ON PLANS AND SPECIFICATIONS.
- U. IF A SMOKE EVACUATION AND / OR DETECTION SYSTEM OCCURS FOR THIS SPACE, IT SHALL BE LEFT INTACT DURING CONSTRUCTION AND ANY NEW WORK, MODIFICATIONS AND/ OR WIRING TO BE COMPLETED DURING CONSTRUCTION PHASE TO POINT OF NEW PANELS, WHETHER SHOWN OR NOT SHOWN ON PLANS AND SPECIFICATIONS.
- V. ENGINEER, FURNISH AND INSTALL ANY AND ALL REQUIRED SMOKE EVACUATION, SMOKE DETECTION AND FIRE ALARM SYSTEMS, INCLUDING ANY AND ALL PARTS AND LABOR, TO MEET LOCAL CODE, LANDLORD REQUIREMENTS AND FIRE MARSHAL SPECIFICATIONS WHETHER SHOWN OR NOT SHOWN ON PLANS AND SPECIFICATIONS.
- W. THE ELECTRICAL SUBCONTRACTOR TO COORDINATE WITH OTHER ENGINEERING DRAWINGS AND INCLUDE COSTS (LABOR AND MATERIALS) NECESSARY FOR OTHER ELECTRICAL EQUIPMENT / FIXTURES NOT SHOWN ON THESE ELECTRICAL DRAWINGS, BUT SHOWN ON OTHER ENGINEERING DRAWINGS.
- 7. THE TENANT'S GENERAL CONTRACTOR AND/ OR ELECTRICAL SUBCONTRACTOR IS TO INSTALL EMERGENCY AND EXIT LIGHTING, AS REQUIRED BY LOCAL CODE OR AGENCIES HAVING JURISDICTION OVER THE PROJECT. THE EXIT/ EMERGENCY LIGHTING SHOULD BE PROPERLY LABELED AND APPROVED TYPE LOCKOUTS INSTALLED.
- 8. SUBSTITUTIONS: CATALOG AND MANUFACTURER'S NUMBERS IN THIS SECTION AND ON THE DRAWINGS ARE FOR THE PURPOSE OF ESTABLISHING STANDARDS OF QUALITY AND TYPE OF MATERIALS TO BE USED. PRODUCTS OR OTHER MANUFACTURERS MAY BE USED IF SIMILAR AND EQUAL IN QUALITY AND DESIGN IN THE OPINION OF THE OWNER OR OWNER'S ARCHITECT AND ARE SPECIFICALLY APPROVED BY THE OWNER OR OWNER'S ARCHITECT, IN WRITING, PRIOR TO CLOSE OF BIDDING. REQUESTS FOR APPROVAL OF SUBSTITUTIONS SHALL BE IN WRITING, AND SHALL INCLUDE REPORTS OF TESTS, PERFORMANCE DATA OR OTHER PROOF OF EQUALITY TO THE ITEM SPECIFIED.
- 9. SHOP DRAWINGS & SUBMITTALS: PRIOR TO THE COMMENCEMENT OF WORK, SUBMIT ONE (1) SET OF THE FOLLOWING ITEMS TO THE OWNER'S ARCHITECT IN THE FORM OF SHOP DRAWINGS, DETAILS OR CATALOG CUTS FOR THE RECORD: LIGHTING AND POWER PANELS, WIRING DEVICES, SAFETY SWITCHES, TRANSFORMER, TIME CLOCKS, FIRE ALARM EQUIPMENT LAYOUT, DEVICE CUT SHEETS AND ANY OTHER ITEMS AS REQUESTED BY THE OWNER OR THE OWNER'S ARCHITECT.
  - A. BY SUBMITTING SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND SIMILAR SUBMITTALS, THE CONTRACTOR REPRESENTS TO THE CLIENT AND ARCHITECT THAT THE CONTRACTOR HAS (1) REVIEWED AND APPROVED THEM, (2) DETERMINED AND VERIFIED MATERIALS, FIELD MEASUREMENTS AND FIELD CONSTRUCTION CRITERIA RELATED THERETO, OR WILL DO SO AND (3) CHECKED AND COORDINATED THE INFORMATION CONTAINED WITHIN SUCH SUBMITTALS WITH THE REQUIREMENTS OF THE WORK AND OF THE CONTRACT DOCUMENTS.
  - B. THE CONTRACTOR SHALL PERFORM NO PORTION OF THE WORK FOR WHICH THE CONTRACT DOCUMENTS REQUIRE SUBMITTAL AND REVIEW OF SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS UNTIL THE RESPECTIVE SUBMITTAL HAS BEEN APPROVED BY THE ARCHITECT.
  - C. THE WORK SHALL BE IN ACCORDANCE WITH APPROVED SUBMITTALS EXCEPT THAT THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY FOR DEVIATIONS FROM REQUIREMENTS OF THE CONTRACT DOCUMENTS BY ANY APPROVAL OF SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE CLIENT IN WRITING OF SUCH DEVIATION AT THE TIME OF SUBMITTAL AND
    - C.1. THE ARCHITECT HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION AS A MINOR CHANGE IN THE WORK, OR A CHANGE ORDER OR CONSTRUCTION CHANGE DIRECTIVE HAS BEEN ISSUED AUTHORIZING THE DEVIATION.
    - C.2. THE CONTRACTOR SHALL DIRECT SPECIFIC ATTENTION IN WRITING OR ON RESUBMITTED SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS, TO REVISIONS OTHER THAN THOSE REQUESTED BY THE ARCHITECT ON PREVIOUS SUBMITTALS. IN THE ABSENCE OF SUCH WRITTEN NOTICE, THE ARCHITECT'S APPROVAL OF A RESUBMISSION SHALL NOT APPLY TO SUCH REVISIONS.
  - D. THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR ERRORS OR OMISSIONS IN SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS BY THE ARCHITECT'S APPROVAL THEREOF.
- 10. WORKMANSHIP:
  - A. USE EXPERIENCED, WELL-QUALIFIED CRAFTSMEN, IN GOOD STANDING WITH THEIR RESPECTIVE LABOR UNIONS OR TRADE ASSOCIATIONS.
  - B. USE CAPABLE AND EXPERIENCED SUPERINTENDENTS, AUTHORIZED BY THE CONTRACTOR TO INSTRUCT WORK, MAKE JOB DECISIONS AND ACT FOR THE CONTRACTOR IN ALL MATTERS PERTAINING TO THE CONTRACT. SUPERINTENDENT IS TO BE PRESENT WHEN ANY WORK IS BEING CARRIED OUT.
- 11. PERMITS, TESTS AND INSPECTIONS:
  - A. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED PERMITS, FEES, LICENSES AND ROYALTIES TO ACCOMPLISH THE WORK.
  - B. APPLY FOR, SECURE AND PAY FOR ALL REQUIRED TESTS AND INSPECTIONS TO ACCOMPLISH THE WORK IN CONFORMANCE WITH ALL CODES AND JURISDICTIONS.
  - C. FURNISH SIGNED CERTIFIED AND ACCEPTABLE COPIES OF ALL ITEMS COVERED IN (A) AND (B) ABOVE TO THE OWNER FOR HIS RECORDS.
  - D. COMPLY WITH RULES AND REGULATIONS OF JURISDICTIONAL AUTHORITIES AND MALL OR LEASE SPECIFICATIONS AND REPORT ANY DEVIATIONS ON DRAWINGS TO OWNER.
- 12. CODES, RULES AND REGULATIONS: INCLUDE IN ELECTRICAL BID ANY ADDITIONAL MATERIALS AND LABOR THAT MAY BE REQUIRED FOR COMPLIANCE WITH ALL GOVERNING LAWS, RULES AND REGULATIONS, EVEN THOUGH THE WORK IS NOT MENTIONED IN THESE SPECIFICATIONS OR SHOWN ON THE DRAWINGS. NOTHING IN THE PLANS OR SPECIFICATIONS SHALL BE DEEMED AS AUTHORITY TO VIOLATE ANY GOVERNING CODE.
- 13. ACCURACY OF DATA:
  - A. THE DATA GIVEN HEREIN AND ON THE DRAWINGS ARE AS EXACT AS COULD BE SECURED, BUT THEIR ABSOLUTE ACCURACY IS NOT GUARANTEED. THE SPECIFICATIONS AND DRAWINGS ARE FOR THE ASSISTANCE AND GUIDANCE OF THE CONTRACTOR. EXACT LOCATIONS, DISTANCES, LEVELS, ETC., WILL BE GOVERNED BY THE BUILDING AND THE CONTRACTOR SHALL USE THE DATA CONTAINED HEREIN WITH THIS UNDERSTANDING.
  - B. THE EXACT LOCATION OF EACH AND EVERY OUTLET OF EACH WIRING SYSTEM, NOT DIMENSIONED ON THE DRAWINGS, SHALL BE AS DIRECTED BY THE OWNER, THE OWNER'S ARCHITECT OR HIS SELECTED REPRESENTATIVE.
- 14. CLEANUP: REMOVE ALL SURPLUS MATERIAL, EQUIPMENT AND DEBRIS INCIDENTAL TO THIS WORK AND LEAVE THE PREMISES IN A CONDITION ACCEPTABLE TO THE OWNER.
- 15. GUARANTEE: FURNISH A WRITTEN CERTIFIED GUARANTEE, IN ACCEPTABLE FORM TO THE OWNER, AGAINST ANY DEFECTIVE WORKMANSHIP, MATERIAL AND OPERATING EQUIPMENT. THIS GUARANTEE

SHALL BE IN FULL FORCE AND EFFECTIVE FOR A PERIOD OF ONE (1) YEAR AFTER ACCEPTANCE OF THE INSTALLATION.

- 16. TEMPORARY ELECTRIC SERVICE: THE ELECTRICAL CONTRACTOR SHALL PROVIDE TEMPORARY ELECTRICAL WIRING FOR CONSTRUCTION USE AS FOLLOWS: THE SERVICE ENTRANCE AND FEEDER SHALL BE 60 AMPS, SINGLE PHASE, 3 WIRE 120/208 VOLT FUSED MAIN DISCONNECT. THE FEEDER TO SERVE THE TEMPORARY DISTRIBUTION WIRING PROVIDING TEMPORARY LIGHTING IN ALL AREAS AS INDICATED ON DRAWINGS AND WHEREVER REQUIRED FOR THE OPERATION OF 120 VOLT SINGLE PHASE PORTABLE TOOLS AND EQUIPMENT NOT TO EXCEED 1 H.P.. THE WIRING SHOULD BE EXTENDED ALSO, SO THERE IS A 120 VOLT SINGLE PHASE OUTLET WITHIN 75 FEET OF ANY PORTION OF THE BUILDING. PROVIDE GROUND FAULT PROTECTION FOR ALL REQUIRED RECEPTACLES NOT TO BECOME A PERMANENT PART OF THE INSTALLATION.
- 17. STRUCTURAL CONDITIONS: NOTCHING AND BORING OF STRUCTURAL MEMBERS WILL NOT BE PERMITTED. IF CONDUIT, BOXES, ETC. NEED TO BE HUNG FROM STRUCTURAL STEEL, ONLY HANG FROM TOP FLANGE OF BEAMS AND TOP CHORDS AND ONLY AT PANEL POINTS OF JOISTS/ TRUSSES.
- 18. COOPERATION WITH OTHER CONTRACTORS: THIS CONTRACTOR SHALL COOPERATE WITH ALL OTHER CONTRACTORS FURNISHING LABOR MATERIALS AND ALL WORK, SO THAT THE WORK AS A WHOLE SHALL BE EXECUTED AND COMPLETED WITHOUT CONFLICT OR DELAY. IN THE EVENT OF ANY MECHANICAL OBSTRUCTION, AS PLUMBING OR AIR CONDITIONING DUCTS IN WAY OF ELECTRICAL EQUIPMENT, IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO NOTIFY THE OWNER'S ARCHITECT BEFORE COMMENCING ANY WORK.

II. BASIC MATERIALS AND METHODS

1. RACEWAYS AND BOXES:

- A. WHERE SIZES OF RACEWAY OR BOXES ARE NOT INDICATED, THE CONTRACTOR SHALL SIZE THESE ITEMS AS REQUIRED FOR THE INSTALLATION.
- B. FLEXIBLE METAL CONDUIT AS ALLOWABLE BY CODE SHALL BE USED FOR FINAL CONNECTION OF LIGHTING FIXTURES AND WIRING DEVICES TO BE INSTALLED IN HUNG CEILINGS.
- C. WORK INSTALLED IN METAL PARTITIONS SHALL BE RUN IN CONCEALED ELECTRIC METALLIC TUBING OR FLEXIBLE CONDUIT AS REQUIRED BY GOVERNING CODE AND LANDLORD.
- D. BRANCH CIRCUIT WORK CHASED INTO EXISTING CONSTRUCTION FOR CONCEALMENT UNDER PATCHED FINISHES, MAY BE INSTALLED IN RIGID CONDUIT, OR EMT.
- E. CONDUITS THAT RUN EXPOSED ON EXTERIOR OF BUILDING SHALL BE RIGID CONDUIT WITH WEATHER TIGHT, CORROSION RESISTANT FITTINGS.
- F. FLEXIBLE STEEL CONDUITS SHALL BE USED IN MAKING UP SHORT, FLEXIBLE CONNECTIONS TO ROTATING OR VIBRATING MACHINERY, MINIMUM 12" LENGTH AND FOR CONNECTIONS BETWEEN JUNCTION BOXES IN HUNG OR FURRED CEILING FIXTURES.
- G. ALL INTERIOR FEEDERS OR EXPOSED FEEDERS TO THE PUBLIC'S EYE, SHALL BE INSTALLED IN RIGID CONDUIT OR EMT.
- H. ALL INTERIOR LOW VOLTAGE WIRING SHALL BE INSTALLED IN RIGID CONDUIT OR EMT WHERE REQUIRED BY CODE.
- I. MINIMUM SIZE CONDUIT SHALL BE 3/4" TRADE SIZE UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- J. ALL WORK RUN IN UNEXCAVATED AREAS, CRAWL SPACES, TUNNELS, OR UNDERGROUND SHALL BE INSTALLED IN RIGID CONDUIT.
- K. ALL WORK RUN EXPOSED WITHIN THE BUILDING MAY BE INSTALLED IN RIGID STEEL CONDUIT OR ELECTRICAL METALLIC TUBING.
- L. ALL WORK RUN CONCEALED WITHIN HUNG OR FURRED CEILINGS, METAL STUD PARTITIONS AND THE LIKE, MAY BE INSTALLED IN RIGID STEEL CONDUIT, ELECTRIC METALLIC TUBING EXCEPT THAT WIRING IN OR THROUGH SLABS SHALL BE IN RIGID CONDUIT.
- M. GALVANIZED PRESSED STEEL OUTLET BOXES OF PROPER SIZE AND TYPE AS REQUIRED BY THE BUILDING CONDITIONS SHALL BE PROVIDED FOR ALL INTERIOR OUTLETS FOR LIGHTING, SWITCHES, RECEPTACLES, CLOCKS, SIGNALS, AND THE LIKE.
- N. PROVIDE GALVANIZED FITTINGS FOR EXPOSED WORK, THREADED FOR CONDUIT CONNECTIONS AND PROVIDE WITH SUITABLE COVERS.
- O. THE OUTLETS FOR LOCAL SWITCHES SHALL BE INSTALLED ADJACENT TO THE TRIM ON THE STRIKING SIDE OF THE DOOR, REGARDLESS OF THE LOCATIONS INDICATED ON THE DRAWINGS; THEREFORE, CHECK ALL DOOR SWINGS BEFORE INSTALLING CONDUIT AND OUTLETS.

2. GROUNDING:

- A. ALL MAJOR PARTS NOT CARRYING CURRENT, INCLUDING THE FOLLOWING ITEMS BELOW, SHALL BE PROPERLY GROUNDED:
  - A.1. SECONDARY FEEDER CONDUIT AND EQUIPMENT ENCLOSURES.
  - A.2. PANEL BOARD ENCLOSURES, PULL AND JUNCTION BOXES, CABLE TROUGHS.
  - A.3. ALL CONDUITS, METAL MOLDING AND OUTLET BOXES.
  - A.4. FAN AND EQUIPMENT HOUSINGS EXPOSED ON THE STRUCTURE OR ON GRADE.
- B. ALL CASH REGISTER OUTLETS TO BE ISOLATED AND SEGREGATED.

- 3. SAFETY SWITCHES: PROVIDE WHERE SHOWN OR AS REQUIRED, HEAVY-DUTY, METAL ENCLOSED, EXTERNALLY OPERATED FUSED, OR UNFUSED, SAFETY SWITCHES, OF SUCH TYPE AND SIZE AS REQUIRED TO PROPERLY PROTECT OR DISCONNECT THE LOAD FOR WHICH THEY ARE INTENDED. THE OPERATING MECHANISM SHALL BE SO DESIGNED THAT THE SWITCHES MAY BE LOCKED IN THE "ON" OR "OFF" POSITIONS WHERE "WEATHERPROOF" SAFETY SWITCHES ARE INDICATED OR REQUIRED, THESE SHALL BE AS SPECIFIED ABOVE EXCEPT ENCLOSURES SHALL BE NEMA III, RAIN TIGHT.

4. MOTOR AND OTHER WIRING:

- A. PROVIDE ALL REQUIRED CONDUIT, WIRING AND SAFETY SWITCHES FOR ALL MOTORS, AND ANY OTHER ELECTRICAL EQUIPMENT INSTALLED OR CONNECTED UNDER THIS DIVISION.
- B. ALL MOTORS WILL BE FURNISHED AND SET UNDER OTHER DIVISION, THE WORK OF THIS DIVISION SHALL INCLUDE PROVIDING ALL CONNECTIONS SO AS TO BE COMPLETE.
- C. ALL STARTING DEVICES, MOTOR CONTROLLERS, FLOAT SWITCHES, LEVEL SENSORS, ALARM DEVICES, REMOTE CONTROL PUSH BUTTONS, ETC., WILL BE FURNISHED BY THE VARIOUS CONTRACTORS, UNLESS OTHERWISE NOTED HEREIN, BUT THIS CONTRACTOR SHALL SET THESE DEVICES AND PROVIDE ALL CONNECTIONS.
- D. FOR EACH THERMOSTAT (BY H.V.A.C.), PROVIDE 4" x 4" OUTLET BOX WITH 3/4" EMPTY CONDUIT STUBBED UP INTO CEILING AND BUSHED. PROVIDE STEEL DRAG WIRE FOR EACH LOCATION.

5. WIRING DEVICES:

- A. COMPUTER RECEPTACLES AT CASH WRAP AREA SHALL BE HUBBELL #HG5262, COMPUTER GRADE WITH "ISOLATED" GROUND LUGS.
- B. ALL WIRING DEVICES INSTALLED IN THIS BUILDING SHALL BE "SPECIFIED GRADE," MANUFACTURED BY ARROW, HART AND HEGEMAN, HUBBELL, GENERAL ELECTRIC, OR EQUIVALENT.
- C. LOCAL SWITCHES SHALL BE TOGGLE TYPE, A.C. RATED 20 AMPERES, 125 VOLTS, QUIET-TYPE WITH SILENT OPERATING MECHANISM, TOTAL CLOSED IN A MOLDED COMPOSITION BASE. SWITCHES SHALL BE SINGLE POLE, THREE OR FOUR-WAY AS INDICATED. WHERE LOCK TYPE LOCAL SWITCHES ARE INDICATED, THESE SHALL BE SIMILAR TO ABOVE SPECIFICATION WITH KEY OPERATOR; PROVIDE TO OWNER TWO (2) KEYS FOR EACH SWITCH INSTALLED.
- D. ALL RECEPTACLES INSTALLED IN THIS BUILDING SHALL BE OF THE GROUNDING TYPE, WITH GROUNDING PIN SLOT CONNECTED TO DEVICE GROUND SCREW FOR GROUND WIRE CONNECTION TO CONDUIT SYSTEM.

6. WIRES AND CABLES:

- A. ALL WIRE FOR LIGHT AND POWER INSTALLATIONS SHALL BE HIGH CONDUCTIVITY COPPER, 600 VOLT INSULATED IN ACCORDANCE WITH THE NATIONAL BOARD OF FIRE UNDERWRITERS STANDARDS FOR TYPE "THW" WIRES, EXCEPT AS NOTED ON THE DRAWINGS OR OTHERWISE SPECIFIED HEREIN.
- B. NO WIRE SHALL BE SMALLER THAN NO. 12 A.W.G.. ALL WIRES NO. 8 AND LARGER SHALL BE STRANDED.
- C. WIRES SHALL BE COLOR CODED.
- D. ALL WIRES SHALL BE POLARIZED.
- E. CIRCUIT WORK BETWEEN OUTLET BOXES AND EACH RECESSED LIGHTING FIXTURE SHALL BE TYPE "AF" WIRE.
- F. HOME RUNS AND BRANCH WIRING FOR 120 VOLT CIRCUITS SHALL BE AS FOLLOWS:

LENGTH	HOME RUN WIRE SIZE	CIRCUIT WIRE SIZE
1' TO 50'	12	12
50' TO 100'	10	12
100' TO 150'	8	12

7. LIGHTING AND POWER PANELS:

- A. PANELS SHALL BE CIRCUIT BREAKER TYPE INSTALLED IN CODE GAUGE GALVANIZED SHEET STEEL CABINETS, FLUSH OR SURFACE MOUNTED AS INDICATED ON THE DRAWINGS. THE PANEL SECTIONS SHALL BE MOUNTED AWAY FROM THE BACK OF THE CABINETS IN SUCH A MANNER THAT THERE WILL BE NO SPACE BETWEEN THE CABINET TRIMS AND FRAMES. THE GUTTER SPACES ON ALL SIDES, TOPS AND BOTTOMS SHALL BE OF SUFFICIENT SIZE TO PREVENT OVERCROWDING OF WIRES AND CABLES AND TO PROVIDE SUFFICIENT VENTILATION TO PREVENT OVERHEATING OF THE CIRCUIT BREAKERS. EACH CABINET SHALL BE COMPLETE WITH HINGED DOORS, CYLINDER LOCK, DIRECTORY FRAME AND NEATLY TYPED DIRECTORY CHARTS. ALL PANELS SHALL BE KEYS ALIKE. INSTALL AN ANGLE PIECE ON INSIDE OF EACH TRIM FOR EASE OF INSTALLATION.
  - B. THE BRANCH CIRCUIT BREAKERS, IN GENERAL, SHALL BE MOLDED CASE, BOLT-ON TYPE, RATED 10,000 AIC ON 120/208V, 100 AMPERE FRAME, THERMAL MAGNETIC TRIP SINGLE, TWO OR THREE POLE AS SHOWN ON THE DRAWINGS. ALL MULTIPLE POLE BREAKERS FOR PANELS WHERE INDICATED ON THE DRAWING SCHEDULES, MAIN BREAKER CHARACTERISTICS SHALL BE AS INDICATED ON THE DRAWINGS. MAIN BUSS WORK OF ALL PANELS SHALL AS A MINIMUM, BE DESIGNED TO CARRY THE FULL RATING OF THE FEEDER SWITCH SUPPLYING THE PANEL, AT A CIRCUIT DENSITY OF 800 AMPERES PER SQUARE INCH OF CROSS SECTION. BUSS WORK SHALL BE HIGH CONDUCTIVITY COPPER (277 / 480V CIRCUIT BREAKERS SHALL BE RATED AT 14,000 A.I.C.).
  - C. PANEL SECTIONS SHALL BE SUCH THAT NO LIVE PARTS ARE EXPOSED AFTER INSTALLATION. THEY SHALL BE SO ARRANGED THAT EACH BREAKER IS READILY REMOVABLE FROM THE PANEL WITHOUT DISTURBING ADJACENT BREAKERS. ELECTRICAL CONTRACTOR TO PROVIDE TYPED BREAKER LIST.
  - D. PHASE LEGS SHALL BE ALTERNATELY BUSSED TO EACH CIRCUIT BREAKER IN A MANNER TO AFFECT BALANCING THE BRANCH CIRCUIT CONNECTIONS AS NEARLY AS POSSIBLE OVER EACH PHASE.
8. DRY TYPE TRANSFORMERS (IF NEW IS REQUIRED):
- A. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL A DRY TYPE AIR COOLED INDOOR POWER TRANSFORMER, AS RATED ON THE DRAWINGS AND HEREINAFTER SPECIFIED.
  - B. THE TRANSFORMER SHALL BE PROVIDED WITH SUITABLE VIBRATION DAMPERS. SAME TO BE PLACED BETWEEN THE CORE AND THE COILS OF THE ENCLOSURE.
  - C. THE TRANSFORMER SHALL HAVE CLASS 'H' INSULATION, AND THE WIRING TEMPERATURE RISE SHALL NOT EXCEED 150 DEGREES CELSIUS UNDER FULL LOAD IN AN AMBIENT TEMPERATURE OF 40 DEGREES CELSIUS.
  - D. THE TRANSFORMER ENCLOSURE SHALL BE PRIMED INSIDE AND OUT WITH A ZINC-COATED CHROMATE IRON OXIDE RUST INHIBITING PRIMER AND FINISHED ASA#1 GRAY ENAMEL.
  - E. THE MAXIMUM ACCEPTABLE NOISE LEVEL SHALL NOT EXCEED THE FOLLOWING: 0 TO 150 KVA - 42 dB
9. LIGHTING FIXTURES:
- A. ALL LIGHTING FIXTURES AND LAMPS SHALL BE SUPPLIED BY THE TENANT AND / OR TENANT'S LIGHT FIXTURE AND LAMP SUPPLIER UNLESS OTHERWISE NOTED, AND SHALL BE DELIVERED HANDED, ASSEMBLED AND INSTALLED AT THE SITE BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE UNLOADING, STORAGE AND PROTECTION OF ALL ITEMS FOUND TO BE DEFECTIVE AND SHALL BE REPLACED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
  - B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL THE NECESSARY LABOR AND MATERIALS FOR THE COMPLETE INSTALLATION OF THE LIGHTING FIXTURES AS INDICATED ON THE DRAWINGS.
  - C. ALL FLUORESCENT AND INCANDESCENT LAMPS SHALL BE AS NOTED ON PLANS AND SPECIFICATIONS AND SHALL BE PROVIDED BY THE TENANT AND/OR TENANT'S LIGHT FIXTURE AND LAMP SUPPLIER AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
  - D. SEE ELECTRICAL DRAWING FOR LIGHTING FIXTURE DESCRIPTIONS.

III. SPECIFIC ELECTRICAL SPECIFICATIONS

- 1. SEE ELECTRICAL DRAWINGS - LANDLORD'S CRITERIA: THE ELECTRICAL CONTRACTOR IS TO BECOME FAMILIARIZED WITH LANDLORD'S CRITERIA FOR THIS LOCATION AND INCLUDE ANY WORK REQUIRED OF THIS CRITERIA, WHICH IS NOT SPECIFICALLY NOTED IN THESE DRAWINGS AND SPECIFICATIONS.

IV. TELEPHONE

- 1. PROVIDE 3/4" EMT IN WALLS WITH DRAG STRING AT EACH LOCATION.

V. MISCELLANEOUS

- 1. ALUMINUM WIRE IS STRICTLY PROHIBITED FOR THIS PROJECT.
- 2. DURING DEMOLITION, ANY ELECTRICAL EQUIPMENT, FIXTURE SYSTEMS, CONDUIT AND WIRE ARE TO BE REMOVED AS NOTED AND NOT REUSED. THIS UNUSED EQUIPMENT, FIXTURE SYSTEMS, CONDUIT, AND WIRE MAY NOT BE ABANDONED AND LEFT WITHIN THE SPACE. THEY MUST BE REMOVED TO AN APPROVED DISPOSAL SITE.

HOME RUNS AND BRANCH WIRING FOR 120 VOLT 16 AMP CIRCUITS SHALL BE AS FOLLOWS TO ACCOUNT FOR VOLTAGE DROP:

LENGTH	HOME RUN WIRE SIZE	CIRCUIT WIRE SIZE
1' TO 65'	12	12
66' TO 104'	10	12
105' TO 156'	8	12
157' TO 263'	6	12
264' TO 419'	4	12

### ELECTRICAL PANEL SCHEDULE

PANELBOARD		M		VOLTAGE		120 / 208 V		PHASE		3		WIRE		4	
PANEL TYPE		MLO		MAINS		200 AMP MLO		BUS RATING		400 AMP		AIC RATING		V.I.F.	
NEMA TYPE ENCLOSURE		1		MOUNTING		RECESSED		OPTIONS		NOTE		EXISTING PANEL			
CKT. NO.		DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION		CKT. NO.	
1	(N)					4,323	A	4,383						2	
3	(E)	EXISTING RTU-1	3	(E)	45	4,323	B	4,383	35	(E)	3	EXISTING EDH-1		(E)	4
5						4,323	C	4,383						6	
7						4,323	A							8	
9	(E)	EXISTING RTU-2	3	(E)	45	4,323	B		60		3	SPARE		(E)	10
11						4,323	C							12	
13						3,843	A							14	
15	(E)	EXISTING RTU-3	3	(E)	40	3,843	B		35		3	SPARE		(E)	16
17						3,843	C							18	
19	(E)	EXISTING RTU-4	2	(E)	30	2,496	A		60		3	SPARE		(E)	20
21						2,496	B							22	
23	(E)	EXISTING RTU-5	2	(E)	30	2,496	C							24	
25						2,496	A							26	
27							B		20		3	SPARE		(E)	28
29	(E)	SPACE	3				C							(E)	30
31							A		20		1	SPARE		(E)	32
33	(E)	SPACE					B					SPACE		(E)	34
35	(E)	SPACE					C					SPACE		(E)	36
37						9,846	A	21,140						38	
39	(E)	EXISTING PANEL "A"	3	(E)	200	11,110	B	15,800	200	(E)	3	EXISTING PANEL "B"		(E)	40
41						10,820	C	16,280						42	

ALL PHASES TO BE BALANCED TO WITHIN 7%  
A= 52,850 WATTS  
B= 46,278 WATTS  
C= 46,468 WATTS

(E) EXISTING TO REMAIN  
(N) NEW CIRCUIT  
GFCI GROUND FAULT CURRENT INTERRUPTER  
IG CIRCUITS WITH ISOLATED GROUND  
TC CIRCUITS ON TIMECLOCK  
ds# LIGHT CIRCUITS VIA DIMMER SWITCHES  
C# CIRCUITS ON LIGHTING CONTACTORS  
a,b,c SWITCHES CONTROLLING LIGHTS

TOTAL CONNECTED LOAD	1,45,596	WATTS	405	AMPS
TOTAL DEMAND LOAD	95,345	WATTS	265	AMPS

### ELECTRICAL PANEL SCHEDULE

PANELBOARD		A		VOLTAGE		120 / 208 V		PHASE		3		WIRE		4	
PANEL TYPE		MLO		MAINS		200 AMP MLO		BUS RATING		225 AMP		AIC RATING		10KAIC	
NEMA TYPE ENCLOSURE		1		MOUNTING		RECESSED		OPTIONS		NOTE		EXISTING PANEL			
CKT. NO.		DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION		CKT. NO.	
1	(N)	BUILDING SIGN	1	12	20	1,200	A	600	20	12	1	EXISTING LIGHTING		(E)	2
3	(N)	BUILDING EXTERIOR LIGHTING	1	12	20	600	B	2,500	30	10	1	HOT WATER HEATER (EWH-1)		(N)	4
5	(N)	BUILDING SIGN	1	12	20	1,200	C	2,500						6	
7	(N)	SALES AREA LIGHTING	1	12	20	816	A		20		1	SPARE		(N)	8
9	(N)	SALES AREA LIGHTING	1	12	20	950	B	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	10
11	(N)	SALES AREA LIGHTING	1	12	20	1,220	C	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	12
13	(N)	SALES AREA LIGHTING	1	12	20	1,150	A	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	14
15	(N)	SALES AREA LIGHTING	1	12	20	1,220	B	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	16
17	(N)	SPARE	1				C	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	18
19	(E)	EXISTING FAAP	1	12	20	180	A	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	20
21	(E)	EXISTING FACP	1	12	20	180	B	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	22
23	(N)	SALES AREA PENDENT (LT-2)	1	12	20	600	C	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	24
25	(E)	WALL GONDOLA LIGHTING	1	12	20	500	A	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	26
27	(N)	WALL GONDOLA LIGHTING	1	12	20	500	B	1,200	20	12	1	EQUIPMENT RECEPTACLE		(N)	28
29	(E)	EXISTING LIGHTING	1	12	20	500	C		20		1	SPARE		(N)	30
31	(N)	EXTERIOR LIGHT (LT-3)	1	12	20	600	A		20		1	SPARE		(N)	32
33	(N)	SPARE	1				B		20		1	SPARE		(N)	34
35	(N)	SPARE	1				C		20		1	SPARE		(N)	36
37	(N)	JUNCTION BOX - PYLON SIGNAGE	1	12	20	1,200	A		20		1	SPARE		(N)	38
39	(N)	OUTDOOR GFI/WP RECEPTACLE	1	12	20	360	B		20		1	SPARE		(N)	40
41	(N)	SPARE	1				C	1,200	20	12	1	DRINKING FOUNTAIN		(N)	42

ALL PHASES TO BE BALANCED TO WITHIN 7%  
A= 9,846 WATTS  
B= 11,110 WATTS  
C= 10,820 WATTS

(E) EXISTING TO REMAIN  
(N) NEW CIRCUIT  
GFCI GROUND FAULT CURRENT INTERRUPTER  
IG CIRCUITS WITH ISOLATED GROUND  
TC CIRCUITS ON TIMECLOCK  
ds# LIGHT CIRCUITS VIA DIMMER SWITCHES  
C# CIRCUITS ON LIGHTING CONTACTORS  
a,b,c SWITCHES CONTROLLING LIGHTS

TOTAL CONNECTED LOAD	31,776	WATTS	89	AMPS
TOTAL DEMAND LOAD	34,990	WATTS	98	AMPS

### ELECTRICAL PANEL SCHEDULE

PANELBOARD		B		VOLTAGE		120 / 208 V		PHASE		3		WIRE		4	
PANEL TYPE		MLO		MAINS		200 AMP		BUS RATING		225 AMP		AIC RATING		10KAIC	
NEMA TYPE ENCLOSURE		1		MOUNTING		RECESSED		OPTIONS		NOTE		SECTION-1			
CKT. NO.		DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION		CKT. NO.	
1	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	A	360	20	12	1	OFFICE RECEPTACLE		(N)	2
3	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	B	360	20	12	1	OFFICE RECEPTACLE		(N)	4
5	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	C	1,200	20	12	1	OFFICE DEDICATED RECEPTACLE		(N)	6
7	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	A	1,200	20	12	1	OFFICE DEDICATED RECEPTACLE		(N)	8
9	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	B		20		1	SPARE		(N)	10
11	(N)	POWER POLE GREEN	1	12	20	1,200	C		20		1	SPARE		(N)	12
13	(N)	POWER POLE GREEN	1	12	20	1,200	A	1,200	20	12	1	COUNTER DEDICATED RECEPTACLE		(N)	14
15	(N)	POWER POLE GREEN	1	12	20	1,200	B	720	20	12	1	COUNTER QUAD RECEPTACLE		(N)	16
17	(N)	POWER POLE GREEN	1	12	20	1,200	C	720	20	12	1	COUNTER QUAD RECEPTACLE		(N)	18
19	(N)	POWER POLE BROWN	1	12	20	1,200	A	1,200	20	12	1	COUNTER DEDICATED RECEPTACLE		(N)	20
21	(N)	POWER POLE BROWN	1	12	20	1,200	B	1,200	20	12	1	COUNTER DEDICATED RECEPTACLE		(N)	22
23	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	C	1,200	20	12	1	BEVERAGE COOLER RECEPTACLE		(N)	24
25	(N)	SHOW WINDOW RECEPTACLE	1	12	20	1,500	A	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	26
27	(N)	SPARE	1				B	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	28
29	(N)	POWER POLE GREEN	1	12	20	1,200	C	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	30
31	(N)	POWER POLE GREEN	1	12	20	1,200	A	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	32
33	(N)	POWER POLE GREEN	1	12	20	1,200	B	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	34
35	(N)	POWER POLE GREEN	1	12	20	1,200	C	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	36
37	(N)	POWER POLE BROWN	1	12	20	1,200	A	1,200	20	12	1	CHECKOUT DEDICATED RECEPTACLE		(N)	38
39	(N)	POWER POLE BROWN	1	12	20	1,200	B	720	20	12	1	CHECKOUT QUAD RECEPTACLE		(N)	40
41	(N)	SPARE	1				C	360	20	12	1	CHECKOUT QUAD RECEPTACLE		(N)	42

ALL PHASES TO BE BALANCED TO WITHIN 7%  
A= 16,860 WATTS  
B= 13,200 WATTS  
C= 13,680 WATTS

(E) EXISTING TO REMAIN  
(N) NEW CIRCUIT  
GFCI GROUND FAULT CURRENT INTERRUPTER  
IG CIRCUITS WITH ISOLATED GROUND  
TC CIRCUITS ON TIMECLOCK  
ds# LIGHT CIRCUITS VIA DIMMER SWITCHES  
C# CIRCUITS ON LIGHTING CONTACTORS  
a,b,c SWITCHES CONTROLLING LIGHTS

TOTAL CONNECTED LOAD	43,740	WATTS	122	AMPS
TOTAL DEMAND LOAD	34,745	WATTS	97	AMPS

### ELECTRICAL LOAD SUMMARY

DESCRIPTION	NEC CONNECTED KW	VOLT	PHASE	NEC DEMAND FACTOR	NEC DEMAND KW
LIGHTING - 120V	9.3	120	1	1.25	11.6
EXTERIOR SIGN	1.2	120	1	1.25	1.5
RECEPTACLES	38.4	120	1	>10kW=10+(0.5*(kW-10))	24.2
STOREFRONT SIGN	2.4	120	1	1.25	3.0
S/W OUTLETS	10.5	120	1	1.25	13.1
EXHAUST FAN	0.2	120	1	1.25	0.3
ROOFTOP UNITS	47.5	208	3	1.00	47.5
EQUIPMENT	12.0	120	1	1.00	12.0
HOT WATER HEATER	5.0	208	1	1.00	5.0
ELECTRIC HEATER	6.0	120	1	1.00	6.0
ELECTRIC DUCT HEATER	13.1	208	3	1.00	13.1
TOTALS	145.6				137.3

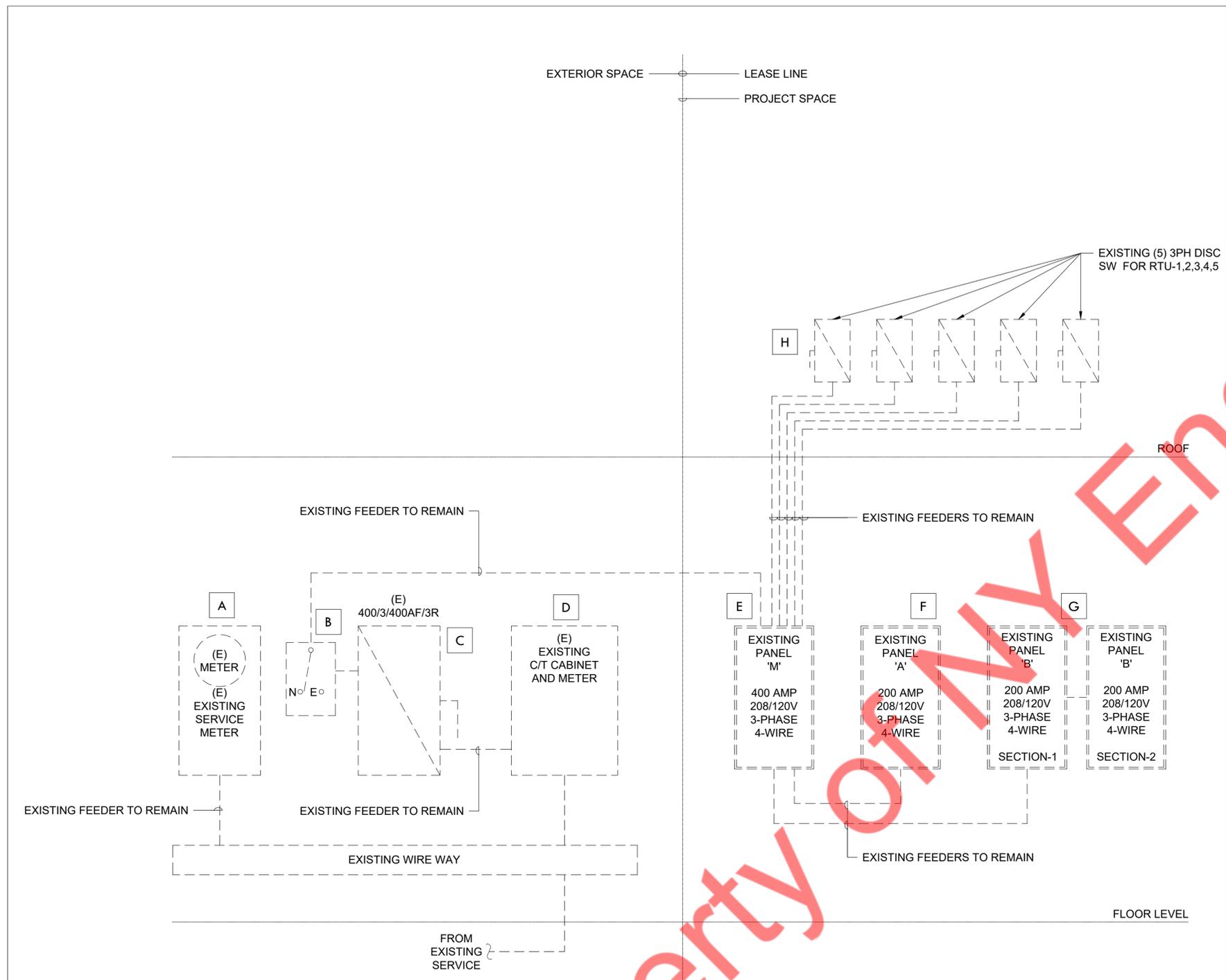
NOTES:  
\* USE GREATER VALUE OF THE TWO CATEGORIES.  
\*\* 125% OF THE LARGEST MOTOR OR COMPRESSOR IN SYSTEM APPLIED ONLY ON ONE UNIT.  
\*\*\* N.E.C. ARTICLE 220-12 REQUIREMENT (200 VA PER FOOT OF SHOW WINDOW) MINUS ACTUAL SHOW WINDOW LIGHTING kVA.

N.E.C. DEMAND kVA x 1,000  
SYSTEM VOLTAGE x 1.732

137.3 x 1000 = 1,37,265      381.0 AMPS      USE (EXIST) 400AMP SERVICE.  
208 x 1.732 = 360

### ELECTRICAL PANEL SCHEDULE

PANELBOARD		B		VOLTAGE		120 / 208 V		PHASE		3		WIRE		4	
PANEL TYPE		MLO		MAINS		200 AMP MLO		BUS RATING		225 AMP		AIC RATING		10KAIC	
NEMA TYPE ENCLOSURE		1		MOUNTING		RECESSED		OPTIONS		NOTE		SECTION-2			
CKT. NO.		DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION		CKT. NO.	
43	(E)	EH-1	1	12	20	1,500	A	900	20	(E)	1	EXISTING ROOF OUTLETS		(E)	44
45	(E)	EH-2	1	12	20	1,500	B		20	(E)	1	SPARE		(E)	46
47	(E)	EH-3	1	12	20	1,500	C	540	20	12	1	STHL BOH RECEPTACLES		(N)	48
49	(E)	EH-4	1	12	20	1,500	A	180	20	12	1	BREAK ROOM RECEPTACLE		(N)	50
51	(N)	EF-2	1	12	20	200	B	900	20	12	1	BREAK ROOM RECEPTACLES		(N)	52
53	(N)	CIRCULATION PUMP (RCP-1)	1	12	20	200	C	360	20	12	1	RESTROOM GFI RECEPTACLES		(N)	54
55	(E)	SPARE	1				A							(E)	56
57	(E)	SPARE	1				B		15		3	SPARE		(E)	58
59	(E)	SPARE	1				C							(E)	60
61	(E)	EXISTING TIME CLOCK	1	12	20	200	A							(E)	62
63	(E)	SPARE	1				B		25		1	SPARE		(E)	64
65		SPARE					C							(E)	66
67		SPARE					A		25		3	SPARE		(E)	68
69		SPARE					B							(E)	70
71		SPARE					C		20		1	SPARE		(E)	72
73		SPARE					A		20		1	SPARE		(E)	74
75		SPARE													



**RISER GENERAL NOTES:**

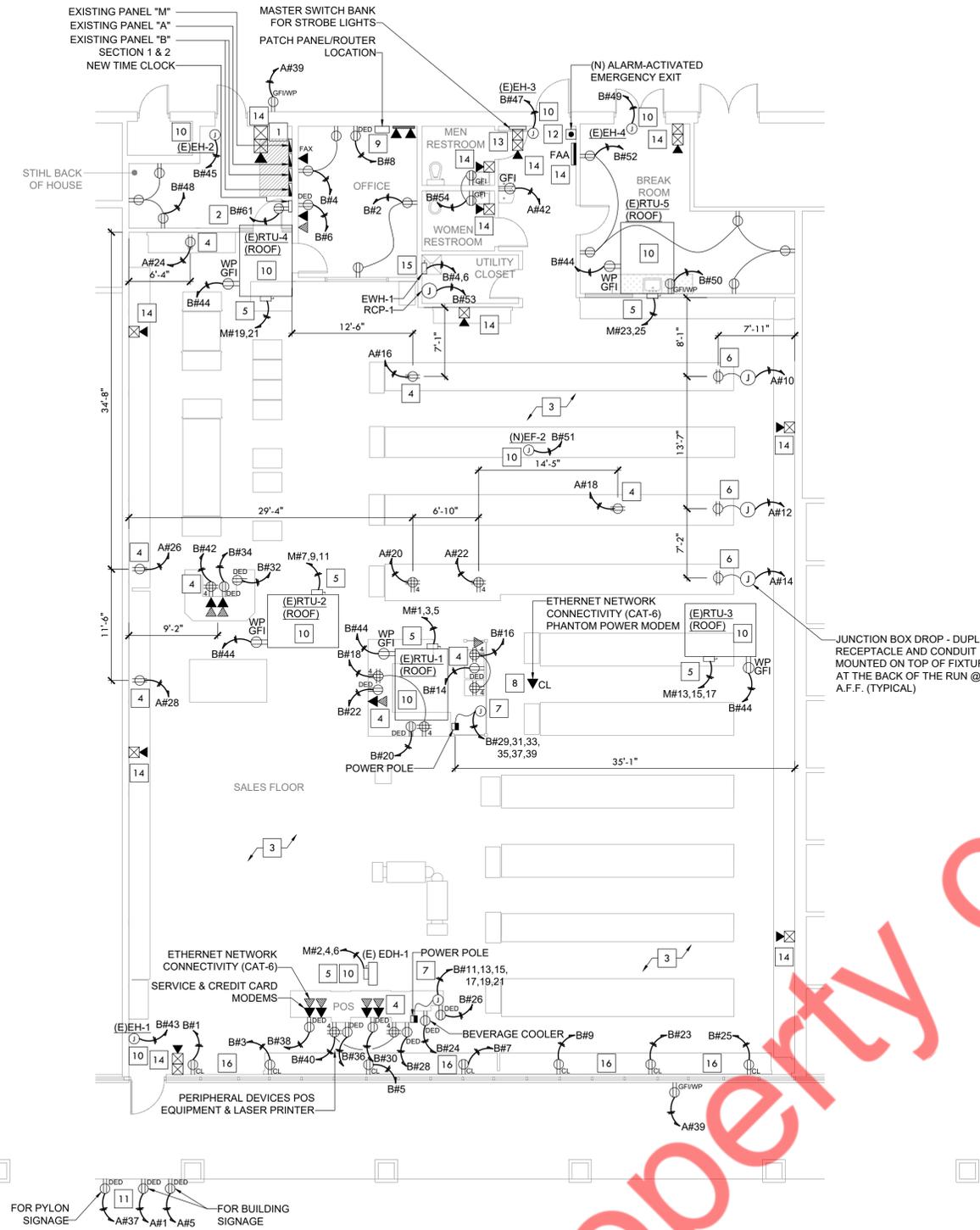
1. ALL CONDITIONS TO BE FIELD VERIFIED BEFORE SUBMITTING BID.
2. CONTRACTOR TO MAINTAIN FIRE RATING OF PARTITION NEW ELECTRICAL EQUIPMENT IS BEING SECURED TO.
3. ALL ELECTRICAL WORK BEING SHOWN IN SCHEMATIC IS EXISTING UNLESS OTHERWISE NOTED.
4. CONTRACTOR IS RESPONSIBLE FOR CHECKING ALL VOLTAGES ON PLANS UPON FIRST VISIT TO THE SITE. THE INCOMING SERVICE SHOULD CORRESPOND TO THE SPECIFICATIONS FOR THE LIGHTING FIXTURES AND THE H.V.A.C EQUIPMENT AND BE PROPERLY NOTED ON THE ELECTRICAL PANEL DIAGRAMS AND RISERS. ANY DISCREPANCIES SHOULD BE REPORTED TO THE ARCHITECT IMMEDIATELY.
5. HVAC CIRCUIT BREAKERS SHALL BE "HACR" TYPE WHERE REQUIRED BY EQUIPMENT NAMEPLATE PER N.E.C.
6. CONTRACTOR SHALL FIELD VERIFY EXACT A.I.C. RATING OF LANDLORD'S DISTRIBUTION EQUIPMENT, FURNISH AND INSTALL TENANTS SYSTEM TO MATCH.
7. ELECTRICAL CONTRACTOR SHALL BALANCE ALL PANELS AND + ELECTRICAL EQUIPMENT TO 10% ( ) BETWEEN PHASES: A/B B/C, - A/C REGARDLESS OF CIRCUITING INDICATED.
8. PROPER CLEARANCE MUST BE MAINTAINED ABOUT ELECTRICAL EQUIPMENT PER N.E.C. FIELD VERIFY EXACT MOUNTING SPACE AVAILABLE IN ELECTRICAL ROOM/AREA PRIOR TO INSTALLATION OF ELECTRICAL EQUIPMENT.
9. CONTRACTOR SHALL MAKE ALL FINAL ELECTRICAL CONNECTIONS FOR A COMPLETE ELECTRICAL DISTRIBUTION SYSTEM.
10. ALL ELECTRICAL WORK SHALL BE INSTALLED SO AS TO READILY ACCESSIBLE FOR OPERATING, SERVICING, MAINTAINING & REPAIRING.

**RISER KEY NOTES:**

- A. EXISTING SERVICE METER TO REMAIN. E.C. SHALL VERIFY THE EXACT RATING, VOLTAGE, PHASE, LOCATION & OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- B. EXISTING 400 AMP, 208/120V, 3-PHASE, 4-WIRE SE RATED MANUAL TRANSFER SWITCH (DOUBLE THROW) WITH CAPPED NIPPLES. E.C. SHALL VERIFY THE EXACT RATING, VOLTAGE, PHASE, LOCATION & OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- C. EXISTING 400 AMP, 208/120V, 3-PHASE SERVICE FUSED DISCONNECT SWITCH SHALL REMAIN. E.C. SHALL COORDINATE WITH UTILITY COMPANY/ARCHITECT/OWNER FOR THE EXACT SIZE, VOLTAGE, PHASE AND LOCATION IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE IN COORDINATION WITH UTILITY/OWNER. BASE BID ACCORDINGLY.
- D. EXISTING 400 AMP, 208/120V, 3-PHASE ELECTRICAL C/T CABINET & METER SHALL REMAIN. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT SIZE, VOLTAGE, PHASE AND LOCATION IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE IN COORDINATION WITH ARCHITECT/OWNER. BASE BID ACCORDINGLY.
- E. EXISTING 400 AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "M" SHALL REMAIN. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT SIZE, VOLTAGE, PHASE AND LOCATION IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE IN COORDINATION WITH ARCHITECT/OWNER. BASE BID ACCORDINGLY.
- F. EXISTING 200 AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "A" SHALL REMAIN. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT SIZE, VOLTAGE, PHASE AND LOCATION IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE IN COORDINATION WITH ARCHITECT/OWNER. BASE BID ACCORDINGLY.
- G. EXISTING 200 AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "B" (SECTION-1 & SECTION-2) SHALL REMAIN. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT SIZE, VOLTAGE, PHASE AND LOCATION IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION IN FIELD. PROVIDE NEW IF FOUND INOPERABLE IN COORDINATION WITH ARCHITECT/OWNER. BASE BID ACCORDINGLY.
- H. EXISTING DISCONNECT SWITCH FOR EXISTING RTU-1,2,3,4,5 SHALL REMAIN. E.C. SHALL COORDINATE EXACT SIZE, VOLTAGE, PHASE AND LOCATION IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION OF EXISTING DISCONNECT SWITCH IN FIELD. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

LEGEND:  
 - - - - - NEW  
 \_\_\_\_\_ EXISTING

**RISER DIAGRAM**



\*NOTE:  
VERIFY FINAL LOCATION OF ALL ELECTRICAL WITH THE FINAL FIXTURE LAYOUT PLAN PROVIDED BY STORE PLANNING.

### ELECTRICAL POWER & FIRE ALARM SYMBOLS

SYMBOL	DESCRIPTION
⊕	120V 20AMP DUPLEX RECEPTACLE
⊕4	120V 20AMP QUAD RECEPTACLE
⊕GFI	120V 20AMP DUPLEX RECEPTACLE W/GROUND FAULT INTERRUPTER
⊕GFIWP	120V 20AMP DUPLEX RECEPTACLE W/GROUND FAULT INTERRUPTER - WEATHER PROOF
⊕	120V 20AMP DUPLEX RECEPTACLE MOUNTED 7'-0" A.F.F.
⊕PD	120V 20AMP DUPLEX RECEPTACLE W/PULL DOWN REEL
⊕DED	120V 20AMP DUPLEX RECEPTACLE W/ISOLATED GROUND
⊕DED 208V	120V 30AMP DUPLEX RECEPTACLE W/ISOLATED GROUND
⊕	POWER POLE - DUAL CHANNEL
⊕	JUNCTION BOX
⊕	DISCONNECT SWITCH
▼	VOICE JACK LOCATION ( RJ11- 6 PIN)
▼	DATA JACK LOCATION ( RJ45- 8 PIN)
▼	DATA JACK/VOICE JACK COMBO
⊕	FIRE ALARM INITIATION DEVICE. PULL STATION @42" AFF
⊕	FIRE ALARM NOTIFICATION DEVICE. AUDIO AND VISUAL
⊕	FIRE ALARM ANNUCIATOR PANEL

NOTE:  
FIRE ALARM NOTIFICATION DEVICE SHALL BE CEILING SUSPENDED VIA THREADED ROD. E.C. SHALL COORDINATE THE EXACT LOCATION & MOUNTING WITH ARCHITECT/OWNER PRIOR TO INSTALLATION IN FIELD.

### POWER PLAN KEY NOTES

- EXISTING ELECTRICAL PANELS SHALL REMAIN. E.C. TO COORDINATE EXACT RATING, VOLTAGE, PHASE, ELECTRICAL DISTRIBUTION & LOCATION WITH ARCHITECT/OWNER IN FIELD. E.C. SHALL VERIFY OPERABLE CONDITION OF EXISTING ELECTRICAL PANELS IN FIELD. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- NEW TIME CLOCK/LIGHTING CONTACTOR PANEL. E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER. E.C. SHALL VERIFY IF ANY EXISTING TIME CLOCK AVAILABLE ON FIELD IN USABLE CONDITION. REUSE IF POSSIBLE. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- CONTRACTOR SHALL CONFIRM THE FINAL NUMBER AND LOCATION OF OUTLETS IN SALES AREA WITH THE FINAL FIXTURE PLAN PRIOR TO ROUGH-IN.
- E.C. TO COORDINATE WITH EQUIPMENT SUPPLIER/OWNER FOR THE EXACT POWER REQUIREMENTS, LOCATION AND MOUNTING HEIGHT OF RECEPTACLE AND JUNCTION BOX PRIOR TO ROUGH-IN. PROVIDE ACCORDINGLY.
- ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE NEMA 3R RATED. COORDINATE EXACT ELECTRICAL REQUIREMENT & LOCATION WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. CIRCUIT FACTORY INSTALLED RECEPTACLE AS REQUIRED. OTHERWISE PROVIDE NEW AS SHOWN.
- JUNCTION BOX TO FEED CABLE WHIP TO 120V 20A DUPLEX RECEPTACLE ON FIXTURE KICK PLATE. E.C. TO COORDINATE WITH EQUIPMENT SUPPLIER/OWNER FOR THE EXACT POWER REQUIREMENTS, LOCATION AND MOUNTING HEIGHT OF RECEPTACLE AND JUNCTION BOX PRIOR TO ROUGH-IN. PROVIDE ACCORDINGLY.
- POWER POLE - DUAL POLE. E.C. SHALL COORDINATE WITH OWNER/ARCHITECT FOR THE EXACT POWER REQUIREMENTS, LOCATION AND MOUNTING OF POWER POLE IN FIELD.
- CEILING MOUNTED DATA. E.C. SHALL COORDINATE WITH OWNER/ARCHITECT FOR THE EXACT POWER REQUIREMENTS AND LOCATION IN FIELD.
- PATCH PANEL/ROUTER. E.C. SHALL COORDINATE WITH OWNER/ARCHITECT FOR THE EXACT LOCATION IN FIELD.
- E.C. TO COORDINATE WITH MECHANICAL CONTRACTOR FOR THE EXACT ELECTRICAL REQUIREMENTS & LOCATION OF EXISTING MECHANICAL EQUIPMENTS IN FIELD.
- PROVIDE 120V 20AMP DUPLEX WEATHER PROOF RECEPTACLE FOR BUILDING SIGNAGE/PYLON SIGNAGE. E.C. SHALL COORDINATE WITH SIGNAGE VENDOR/OWNER/ARCHITECT FOR THE EXACT ELECTRICAL REQUIREMENT AND LOCATION IN FIELD.
- EXISTING ALARM ACTIVATED EMERGENCY EXIT TO REMAIN. G.C. TO TEST SYSTEM AND REPLACE EXISTING IF NON-FUNCTIONING. BASE BID ACCORDINGLY.
- MASTER SWITCH BANK FOR STROBE LIGHTS. E.C. SHALL COORDINATE THE EXACT REQUIREMENTS, LOCATION & MOUNTING HEIGHT WITH ARCHITECT/OWNER IN FIELD PRIOR TO ROUGH-IN.
- E.C. TO VERIFY EXACT FIRE ALARM DEVICE REQUIREMENTS, QUANTITY AND LOCATION AS PER LOCAL COUNTY/STATE CODE AND PROVIDE DEVICES AS REQUIRED FOR THE PROJECT SPACE. BASE BID ACCORDINGLY.
- ELECTRICAL CONTRACTOR SHALL PROVIDE NEW ELECTRICAL CONNECTION & ACCESSORIES FOR WATER HEATER EWH-1. PROVIDE ONE 30A-2P BREAKER IN SOURCE PANEL(#10, 1#10GRD-3/4"C). COORDINATE EXACT POWER REQUIREMENTS WITH PLUMBING CONTRACTOR/ MANUFACTURER SPECIFICATION.
- ELECTRICAL CONTRACTOR SHALL FIELD VERIFY THE OPERABLE CONDITION OF EXISTING SHOW WINDOW RECEPTACLE. REUSE IF POSSIBLE. OTHERWISE, PROVIDE NEW SHOW WINDOW RECEPTACLE AS PER PLANS AND NEC 210.62 IF REQUIRED.

### ABBREVIATIONS

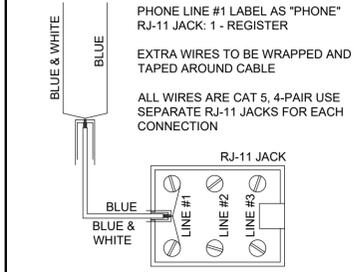
AC	6" ABOVE COUNTER SPACE OR 42" AFF	IG	INSOLATED GROUND
AF	AMP FUSE	ISC	SHORT CIRCUIT CURRENT
AFF	ABOVE FINISHED FLOOR	LTG	LIGHTING
AL	ALUMINIUM	MTD	MOUNTED
BFC	BELOW FINISH CEILING	N	NEUTRAL
BKR	BREAKER	NL	NIGHT LIGHT
CND	CONDUIT	NEC	NATIONAL ELECTRIC CODE
CONN	CONNECTED OR CONNECTION	PNL	PANEL
CTB	CABLE TB TERMINAL BACKBOARD	RECP	RECEPTACLE
CU	COPPER	TEL	TELEPHONE
DN	DOWN	TTB	TELEPHONE
EC	EMPTY CONDUIT	TV	TELEVISION
ELEC	ELECTRICAL	TVSS	TRANSIT VOLTAGE SURGE SUPPRESSOR
FACP	FIRE ALARM CONTROL PANEL	TYP	TYPICAL
FAA	FIRE ALARM ANNUCIATOR PANEL	XFMR	TRANSFORMER
G OR GRND	GROUND	UG	UNDERGROUND
GFCI OR GF	GROUND FAULT CIRCUIT INTERRUPTER	WP	WEATHERPROOF
CL	CEILING MOUNTED		

### GENERAL NOTES

- ALL WORK SHALL BE IN STRICT CONFORMANCE WITH THE LATEST NATIONAL ELECTRIC CODE AND APPLICABLE STATE CODES.
- OBTAIN AND PAY ALL FEES FOR PERMITS AND OBTAIN APPROVALS FROM AUTHORITIES HAVING JURISDICTION.
- GUARANTEE ALL MATERIALS AND LABOR FOR ONE YEAR FROM THE FINAL ACCEPTANCE DATE OF THE OWNER.
- PROVIDE ALL NECESSARY CUTTING, PATCHING, EXCAVATING AND BACK FILL TO ACCOMMODATE ELECTRIC WORK. FIRE SEAL ALL WALL AND FLOOR PENETRATIONS WITH A UL LISTED FOAM SEALANT.
- UNLESS OTHERWISE NOTED, LOCATE THE FOLLOWING ITEMS AT HEIGHTS LISTED BELOW:
  - SWITCHES AND CONTROLS +4'-0" AFF TO THE TOP OF DEVICE.
  - RECEPTACLES: +18" TO CENTERLINE
- WIRE SHALL BE INSTALLED AS FOLLOWS:
  - EXPOSED UNFINISHED AREAS (INDOORS): EMT WITH COMPRESSION FITTINGS. USE WIREMOLD IN FINISHED AREAS WHERE IT IS IMPOSSIBLE TO CONCEAL WORK.
  - CONCEALED ABOVE CEILING OR IN STUD WALL: EMT; TYPE MC CABLE (METAL CLAD).
  - FINAL CONNECTIONS TO MOTORS (INDOORS): FLEXIBLE METAL
  - FINAL CONNECTIONS TO MOTORS (OUTDOORS): LIQUID TIGHT FLEX.
  - EXPOSED OUTDOORS: INTERMEDIATE METAL CONDUIT (IMC).
  - BURIED IN EARTH: PVC SCHEDULE 40.
  - UNDERGROUND PRIMARY ELECTRIC SERVICE CONDUITS: PER UTILITY COMPANY REQ'S.
- GENERALLY ALL WORK IN FINISHED AREAS SHALL BE CONCEALED. CONSULT ARCHITECT FOR DIRECTION WHERE WORK CANNOT BE CONCEALED.
- PROVIDE ALL LIGHTING FIXTURES AND LAMPS.
- OUTLET BOXES CONCEALED SHALL BE STAMPED STEEL. OUTLET BOXES EXPOSED TO THE WEATHER SHALL BE CAST ALUMINUM.
- ALL WIRE SHALL BE TYPE THWN (WET LOCATIONS), THHN (DRY LOCATIONS), #12 GAUGE COPPER, MINIMUM SIZE. USE TYPES THWN, THHN OR XHHW FOR FEEDERS AND TYPES THWN/THHN FOR BRANCH CIRCUITS #10 AND SMALLER.
- PLATES ON CONCEALED OUTLETS SHALL BE PLASTIC. COLOR TO BE SELECTED BY THE ARCHITECT.
- GROUNDING SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE.
- SAFETY SWITCHES SHALL BE HEAVY DUTY, SQUARE D OR EQUAL BY G.E. OR ITE.
- PROVIDE PHOTOELECTRIC TYPE DUCT SMOKE DETECTORS WITH REMOTE TEST STATIONS.
- ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL REQUIREMENTS OF MECHANICAL, PLUMBING AND OWNER SUPPLIED EQUIPMENT PRIOR TO ORDERING AND RUNNING CIRCUITING.
- CABLE TV, VOICE, DATA, SECURITY, SOUND SYSTEM WORK TO BE DONE UNDER SEPARATE CONTRACTS WITH THE OWNER.
- PROVIDE A PULL WIRE IN ALL EMPTY CONDUITS.
- ALL ACCESS DOORS REQUIRED IN GENERAL CONSTRUCTION ARE TO BE PROVIDED AND INSTALLED BY THE GENERAL CONTRACTOR. IT IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO IDENTIFY SIZE, TYPE AND LOCATION OF SUCH DOORS FOR PROPER ACCESS TO ALL CONCEALED ELECTRICAL EQUIPMENT, JUNCTION BOXES AND OTHER RELATED ITEMS. THE ELECTRICAL CONTRACTOR SHALL IDENTIFY THESE REQUIREMENTS ON A COORDINATED SHOP DRAWING.

### SPECIFICATIONS

- ELECTRICAL SPECIFICATIONS:
- ALL EXPOSED WIRING SHALL BE CONTAINED IN CONDUIT OF PROPER SIZE.
  - ALL WIRING SHALL CONFORM TO LOCAL, STATE, AND FEDERAL CODES.
  - ELECTRICAL SERVICE TO BE MINIMUM 400 AMP, 3-PHASE (PREFERRED) OR 600 AMP, SINGLE PHASE OR LARGER IF REQUIRED BY CODE OR ELECTRICAL LOAD.
  - REGISTER POWER POLES - VERIFY REGISTER CONFIGURATION ON FINAL FIXTURE PLAN BEFORE ORDERING AND INSTALLATION OF ELECTRICAL COMPONENTS. CUSTOM BUILT POWER POLE ASSEMBLY AVAILABLE FROM D&P CUSTOM LIGHTS & PRODUCTS INC. PHONE # (800) 251-2200 OR (615) 350-7800, 7111 COCKRILL BEND INDUSTRIAL ROAD, NASHVILLE, TN 37209.
  - EXTERIOR EXPOSED PHONE LINES TO BE INSTALLED IN RIGID CONDUIT. PROVIDE EMERSON 3/4" x 5-FEET METALLIC CABLE U-GUARD #755 OR EQUAL.
  - ELECTRIC PANELS TO BE LABELED CORRECTLY WITH LEGIBLE PRINT.
  - LOW VOLTAGE VENDOR TO PROVIDE AND INSTALL ONE (1) 24 GA., 4 TWISTED-PAIR, CATEGORY-FIVE (CAT5) DATA CABLE WITH MODULAR COMBO RJ-11/RJ45 JACK AT MANAGER'S OFFICE. CABLE TO BE RUN FROM JACK TO DATA HUB LOCATION WITH 6'-0" LEFT COILED FOR INSTALLATION TO DATA HUB. A RJ-45 MALE FITTING SHOULD BE CRIMPED ON THIS END. ACE HARDWARE STORE OPENING TEAM WILL MAKE FINAL CONNECTION INTO THE DATA HUB.



2 SCALE N.T.S. PHONE WIRING FOR REGISTER

1 SCALE 1/8" = 1'-0" ELECTRICAL POWER PLAN

### LIGHTING GENERAL NOTES

- 1 E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR LIGHT FIXTURE QUANTITY, HEIGHTS AND LOCATION PRIOR TO ROUGH-IN.
- 2 E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR FINAL MAKE AND MODEL OF LIGHTING FIXTURES.
- 3 E.C. SHALL COORDINATE ALL PROGRAMMING OF LIGHTING CONTROL SYSTEM WITH OWNER PRIOR ROUGH-IN IN FIELD.

### LIGHTING KEY NOTES

- 1 JUNCTION BOX TO LED MULTIFUNCTION LIGHT FIXTURE. E.C. TO COORDINATE WITH ARCHITECT/OWNER/MANUFACTURE FOR THE EXACT ELECTRICAL REQUIREMENTS, LOCATION, QUANTITY AND JUNCTION BOX HEIGHT IN FIELD. PROVIDE ELECTRICAL CONNECTION AS REQUIRED. BASE BID ACCORDINGLY.
- 2 EXISTING LIGHTING FIXTURE AND CONTROLS SHALL REMAIN. E.C. SHALL VERIFY THE OPERABLE CONDITION OF EXISTING LIGHTING FIXTURE & ITS CONTROLS IN FIELD. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- 3 NEW TIME CLOCK/LIGHTING CONTACTOR PANEL. E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER. E.C. SHALL VERIFY IF ANY EXISTING TIME CLOCK AVAILABLE ON FIELD IN USABLE CONDITION. REUSE IF POSSIBLE. PROVIDE NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- 4 PROVIDE NEW DIMMER SWITCH BANK. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT HEIGHT AND LOCATION PRIOR TO INSTALLATION.
- 5 TIE ALL EMERGENCY LIGHT, EXIT SIGN & NIGHT LIGHT WITH MINIMUM 90-MINUTES BATTERY BACK-UP TO AREA LIGHTING BRANCH CIRCUIT AHEAD OF CONTROLS AS SHOWN ON PLAN. "NL" DENOTES NIGHT LIGHT.

### LIGHTING FIXTURE SCHEDULE

CALLOUT	SYMBOL	WATTAGE	DESCRIPTION	MANUFACTURER/MODEL	VOLTS	REMARKS
LP96W		68W	96W LED STRIP LIGHT FIXTURE	LITHONIA TZL1N	120V	SEE ARCHITECTURAL FOR ADDITIONAL INFORMATION REGARDING LIGHTS.
LP96W		68W	96W LED STRIP LIGHT FIXTURE WITH 90 MIN. BATTERY BACKUP	LITHONIA TZL1N	120V	
LP48W		52W	48W LED STRIP LIGHT FIXTURE	LITHONIA ZL1N	120V	
(E)		-	EXISTING	EXISTING	120V	
(E)		-	EXISTING WITH BATTERY BACKUP	EXISTING	120V	
LT-02		200W	PENDENT C-CORD HUNG	BARN LIGHT VWHS16-PC - BLACK	120V	
LT-03		200W	GOOSENECK	BARN LIGHT ASL13 - BLACK	120V	
MJF96		96W	LED MULTIFUNCTION JUNCTION	FURNISHED BY OWNER	120V	
XC		1.5W	COMBINATION EXIT/EMERGENCY LIGHTING UNIT	LITHONIA LHQM-LED-R-H0	120V	
XR		1.5W	REMOTE HEAD LAMP	LITHONIA ELA-QWP-L0309-SD	120V	
T		1.5W	EMERGENCY LIGHTING UNIT	LITHONIA ELM2-LED	120V	
EX		5W	THERMOPLASTIC EXIT SIGN WITH BATTERY BACKUP	COMPASS CORS	120V	

**NOTE:**

SALES AREA EMERGENCY LIGHTING FIXTURES SHALL BE SUSPENDED VIA THREADED ROD FROM CEILING. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT LOCATION & MOUNTING PRIOR TO INSTALLATION IN FIELD.



## GENERAL

ALL WORK SHALL COMPLY WITH ALL STATE, CITY AND LOCAL CODES, RULES AND REGULATIONS. CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS AND INSPECTIONS ASSOCIATED WITH THIS WORK, AND SHALL PAY ALL COSTS AND FEES INVOLVED.

ALL WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE BEST RECOGNIZED PRACTICE IN THE FIELD CONCERNED. MANUFACTURED ITEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED DIRECTIONS, SPECIFICATIONS AND RECOMMENDATIONS.

CONTRACTOR SHALL REVIEW ALL CONTRACT DOCUMENTS AND SHALL BE FAMILIAR WITH THE SCOPE AND REQUIREMENTS OF THIS PROJECT. ANY DISCREPANCIES OR LACK OF CLARITY IN THE DOCUMENTS SHALL BE IDENTIFIED TO THE ARCHITECT OR ENGINEER PRIOR TO THE SUBMISSION OF PRICING BIDS. WITH A SUBMITTED BID, CONTRACTOR IS ACCEPTING THESE DOCUMENTS AS SUFFICIENT DEFINITION OF THE SCOPE OF WORK, AND ANY ADDITIONAL COSTS BASED ON UNCLEARLY OF CONTRACT DOCUMENTS WILL NOT BE CONSIDERED.

CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATIONS FOR EQUIPMENT INSTALLATION PRIOR TO THE SUBMITTAL OF SHOP DRAWINGS. ALL EQUIPMENT AND DEVICES SHALL BE INSTALLED SUCH THAT THEY ARE EASILY ACCESSIBLE AND SERVICEABLE. THIS EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO: PLUMBING FIXTURES, WATER HEATERS, EXPANSION TANKS, PUMPS, BACKFLOW PREVENTERS, VALVES, MIXING VALVES, THERMOMETERS, GAUGES, TRAP PRIMERS AND CLEANOUTS. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE FULL SET OF CONSTRUCTION DOCUMENTS, INCLUDING ARCHITECTURAL, STRUCTURAL, CIVIL, MECHANICAL & ELECTRICAL DRAWINGS (AS APPLICABLE) TO ENSURE ALL PLUMBING WORK IS COORDINATED WITH PHYSICAL CONDITIONS AND ALL OTHER TRADES.

THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE ARCHITECTURAL DRAWINGS TO ENSURE THERE IS ADEQUATE WALL THICKNESS SUCH THAT ALL PIPING, FIXTURE CARRIERS, WALL CLEANOUTS, WALL BOXES, WALL HYDRANTS AND ACCESS PANELS WILL FIT IN THE WALL SPACE. CONTRACTOR SHALL NOTIFY THE ARCHITECT IF WALL SPACE IS INADEQUATE PRIOR TO COMMENCING WORK.

THE CONTRACTOR SHALL OBTAIN EXACT WALL, FIXTURE, AND LAYOUT DIMENSIONS FROM THE ARCHITECTURAL DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ROUGH-IN AND INSTALLATION DRAWINGS FOR ALL PLUMBING FIXTURES, KITCHEN EQUIPMENT AND OWNER FURNISHED EQUIPMENT (AS APPLICABLE), AND SHALL COORDINATE THE PLUMBING INSTALLATION PRIOR TO COMMENCING THE WORK. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING ALL NECESSARY VALVES, CONNECTIONS, TRAPS, ACCESS PANELS, UNIONS, ESCUTCHEONS, WATER HAMMER ARRESTORS, VACUUM BREAKERS, RELIEF VALVES, PIPE INSULATION, AND EQUIPMENT SPECIALTY DEVICES AS REQUIRED TO FACILITATE COMPLETE AND OPERATIONAL CONDITIONS WHICH ARE IN STRICT COMPLIANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

THESE DRAWINGS ARE DIAGRAMMATIC AND DO NOT REFLECT ALL POSSIBLE PHYSICAL CONDITIONS. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND EXACT LOCATIONS OF EQUIPMENT AND FIXTURES. PROVIDE NECESSARY PIPING OFFSETS TO COORDINATE WITH THE BUILDING STRUCTURE, WORK OF OTHER TRADES, AND CONNECTION TO SITE UTILITIES (AS APPLICABLE).

COORDINATE THE ELECTRICAL REQUIREMENTS AND CHARACTERISTICS OF ALL PLUMBING EQUIPMENT WITH THE ELECTRICAL CONTRACTOR PRIOR TO ISSUING SUBMITTALS OR PURCHASING EQUIPMENT.

UNLESS NOTED OTHERWISE, ALL DRAINAGE PIPING SHALL BE SLOPED AT A MINIMUM OF 1/8" PER FOOT. 2" SANITARY PIPING AND ALL GREASE WASTE PIPING SHALL BE SLOPED AT 1/4" PER FOOT.

DOMESTIC WATER PIPING SHALL BE PURGED OF DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION. PIPING TO BE FLUSHED AND STERILIZED IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE HEALTH DEPARTMENT STANDARDS.

ALL DOMESTIC WATER PIPING SUBJECT TO FREEZING SHALL BE INSULATED AND PROVIDED WITH HEAT TRACE. CONDENSATE PIPING SUBJECT TO FREEZING WITHIN WALK-IN FREEZERS SHALL BE INSULATED AND PROVIDED WITH HEAT TRACE. PIPING INSTALLED IN EXTERIOR WALLS SHALL BE WRAPPED IN PIPE INSULATION AND BE LOCATED ON THE INTERIOR SIDE OF THE BUILDING INSULATION.

PIPE PENETRATIONS THROUGH FIRE RATED WALLS OR FLOORS SHALL HAVE EQUIVALENTLY RATED SLEEVES AND SHALL BE SEALED AND FIRE CAULKED WITH A U.L. LISTED FIRE STOPPING SYSTEM INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S LISTED DETAILS AND SPECIFICATIONS.

THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE REQUIREMENTS OF THE COUNTY HEALTH DEPARTMENT AND OTHER LOCAL AUTHORITIES HAVING JURISDICTION REGARDING CROSS CONNECTION CONTROL OR OBTAINING A FOOD SERVICE PERMIT (AS APPLICABLE). REPORT ANY OBSERVED DISCREPANCIES TO THE ARCHITECT OR ENGINEER PRIOR TO COMMENCING WITH THE WORK.

CONTRACTOR SHALL CONFIRM PLUMBING FIXTURE FINISHES WITH THE ARCHITECTURAL SCHEDULES & DETAILS (AS APPLICABLE).

## SUBMITTALS

FURNISH SHOP DRAWINGS FOR MANUFACTURED PRODUCTS. ALL ITEMS SHALL BE CLEARLY MARKED TO MATCH EQUIPMENT MARKS ON THE PLUMBING DRAWINGS. ALL OPTIONS MUST BE CLEARLY MARKED ON THE SUBMITTAL SHEET. A MODEL NUMBER LISTING ON A COVER SHEET IS NOT AN ACCEPTABLE SUBSTITUTE FOR MARKING THE ACTUAL SUBMITTAL SHEET. ELECTRICAL DATA FOR POWERED EQUIPMENT MUST BE INDICATED ON THE SUBMITTAL SHEET FOR THAT ITEM.

ALL ITEMS MUST BE SUBMITTED IN ONE PACKAGE AT THE SAME TIME, IN ELECTRONIC PDF FORMAT. SEPARATE SUBMITTALS FOR FIXTURES AND EQUIPMENT IS NOT ACCEPTABLE.

SUBMITTAL REVIEW IS CONSIDERED A GENERAL ACCEPTANCE OF THE BASIC APPLICABILITY OF THE EQUIPMENT. CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION AND/OR ALTERNATE ARRANGEMENT OF THE EQUIPMENT WITHIN A GIVEN SPACE. WHEN SUBSTITUTED EQUIPMENT IS INSTALLED, CONTRACTOR SHALL BE RESPONSIBLE FOR ANY COORDINATION OR ADDITIONAL COST BROUGHT ON BY THE USE OF THIS EQUIPMENT.

## HANGERS AND SUPPORTS

HANGERS SHALL BE COMPLETE WITH RODS AND SUPPORTS PROPORTIONED TO THE SIZE OF PIPE TO BE SUPPORTED, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

SIZE HANGERS FOR INSULATED PIPING TO BEAR ON OUTSIDE OF INSULATION. PROVIDE INSULATION PROTECTORS AT HANGERS BEARING ON THE OUTSIDE OF INSULATION. PROVIDE A RIGID INSERT OR RIGID INSULATION AT EACH INSULATION PROTECTOR.

WHERE SEVERAL PIPES 2-1/2" AND SMALLER RUN PARALLEL AND IN THE SAME PLANE, THEY MAY BE SUPPORTED ON CANGS OR MULTIPLE HANGERS. LARGER PIPING SHALL BE INDEPENDENTLY HUNG, RUN PARALLEL AND BE EQUALLY SPACED.

PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH LOCAL CODE, AND SPACING OF HANGERS SHALL NOT EXCEED THE LIMITS SET FORTH IN THE LOCAL CODES. PIPES SHALL BE SUPPORTED WITHIN 1'-0" OF EACH ELBOW.

VERTICAL PIPE SUBJECT TO MOVEMENT SHALL BE SUPPORTED FROM THE WALL BY MEANS OF A PIPE CLAMP.

SUPPORT DOMESTIC WATER PIPING IN SPACES BEHIND PLUMBING FIXTURES BY BRACKETS AND U-BOLTS SECURED TO WASTE AND VENT STACKS. SIZE U-BOLTS TO BEAR ON THE PIPING.

AFTER HANGER RODS ARE INSTALLED IN FINISHED CONCRETE CEILING, FILL THE REMAINING OPENING WITH CEMENT SO THAT NO HOLE SHOWS AT THE CEILING.

WHERE COPPER PIPING IS USED, NONFERROUS METAL SUPPORT(S) OR PROPER ISOLATION BETWEEN DISSIMILAR MATERIALS SHALL BE PROVIDED.

PIPE HANGERS AND SUPPORTS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH RECOMMENDATIONS SET FORTH IN MANUFACTURER'S STANDARDIZATION SOCIETY STANDARD PRACTICES NO. SP-69 AND SP-58.

## SLEEVES

SLEEVES SHALL BE PROVIDED WHERE PIPES PASS THROUGH WALLS, FLOORS AND ROOFS. PROVIDE STANDARD WEIGHT STEEL SLEEVES IN CONCRETE AND MASONRY CONSTRUCTION. PROVIDE 26GA GALVANIZED SHEET METAL SLEEVES IN INTERIOR DRYWALL CONSTRUCTION. SLEEVES SHALL BE THE FULL THICKNESS OF WALLS AND SHALL ALLOW FOR THE FULL THICKNESS OF PIPE INSULATION, WHERE APPLICABLE.

SLEEVES MAY BE OMITTED WHEN OPENINGS ARE CORE DRILLED FOR CONCEALED VERTICAL AND HORIZONTAL PIPING. SLEEVES ARE NOT REQUIRED AT INDIVIDUAL PLUMBING FIXTURES OR IN CONCRETE FLOOR SLABS ON GRADE, UNLESS OTHERWISE NOTED.

SLEEVES FOR ALL PIPING PENETRATING FIRE RATED WALLS AND FLOORS SHALL BE PROVIDED WITH 3M PIPE BARRIER NO. CP-25 FIRE PROOFING CAULKING, OR EQUAL, IN ANNULAR SPACE BETWEEN SLEEVE AND PIPING. CONTRACTOR SHALL VERIFY THE RATING OF THE WALL AND CONFIRM THE PENETRATION PROTECTION PROVIDED MEETS THAT RATING.

PENETRATIONS THROUGH OUTSIDE WALLS SHALL BE WATERTIGHT. CAULK BETWEEN PLUMBING PIPE AND SLEEVE. PACK WITH FIBERGLASS AND CAULK, 1" DEEP AT EACH FACE WITH NON-HARDENING SEALANT BETWEEN PIPE AND SLEEVE.

## WASTE AND VENT PIPING SYSTEMS AND ACCESSORIES

SANITARY PIPING SHALL BE PVC SCHEDULE 40 SOLID WALL PIPE AND DWV FITTING SYSTEM.

PIPE AND FITTINGS SHALL BE MANUFACTURED FROM PVC COMPOUND WITH A CELL CLASS OF 12454 PER ASTM D-1784 AND CONFORM WITH NATIONAL SANITATION FOUNDATION (NSF) STANDARD 14. PIPE SHALL BE IRON PIPE SIZE (IPS) CONFORMING TO ASTM D-1785 AND ASTM D-2665. INJECTION MOLDED FITTINGS SHALL CONFORM TO ASTM D-2665. FABRICATED FITTINGS SHALL CONFORM TO ASTM F-1866. SOLVENT CEMENTS SHALL CONFORM TO ASTM D-2564. PRIMER SHALL CONFORM TO ASTM F-656.

OR EXTRA HEAVY HUB AND SPIGOT CAST IRON SOIL CONFORMING ASTM A74, ASTM 888, CIPSI301 WITH RUBBER GASKETS CONFORMING TO ASTM C564. NO-HUB CAST IRON TO HAVE HEAVY DUTY, TYPE 304 STAINLESS STEEL COUPLINGS CONFORMING TO ASTM A 686, TYPE 304 STAINLESS STEEL SHIELD, TYPE 304 STAINLESS STEEL BANDS AND SLEEVE. NPS 1 1/2" TO NPS 4"; 3" WIDE SHIELD WITH 4 BANDS; NPS 5" TO NPS 10"; 4" WIDE BAND WITH 6 BANDS.

WASTE AND VENT PIPING SHALL BE TESTED IN ACCORDANCE WITH THE GOVERNING CODES. AT A MINIMUM, WASTE PIPING SHALL BE TESTED WITH AT LEAST 10 FOOT OF WATER HEAD PRESSURE APPLIED. TESTING WITH AIR IS NOT ALLOWED.

ALL VENTS THROUGH ROOF SHALL BE LOCATED AT LEAST 10'-0" AWAY FROM ANY AIR INTAKE, EVAPORATIVE COOLER, OR ANY OTHER DEVICE THAT WOULD DRAW AIR FROM THE VENT. FLASH AROUND ALL PIPES PENETRATING THROUGH ROOF WITH STANDARD MANUFACTURED FLASHINGS. FLASHING SHALL BE SHEET METAL WITH RUBBER GASKETS AND SHALL EXTEND INTO ROOFING AND UP PIPE DISTANCES IN ACCORDANCE WITH THE LOCAL CODE.

BACK-TO-BACK WATER CLOSETS COMBINING IN THE VERTICAL SHALL UTILIZE A DOUBLE COMBINATION WYE EIGHTH BEND. DOUBLE SANITARY TEE OR SANITARY CROSS IS NOT ACCEPTABLE.

## DOMESTIC WATER SYSTEMS AND ACCESSORIES

WATER PIPING ABOVE SLAB: TYPE 'L' HARD DRAWN COPPER TUBING, ASTM B88, WROUGHT SOLDER JOINTS, ANSI B16.22.

WATER PIPING BELOW SLAB: TYPE 'K' SOFT DRAWN COPPER TUBING, WITH NO JOINTS BELOW SLAB, ASTM B88.

ALL DOMESTIC HOT WATER PIPING SHALL HAVE A MINIMUM PRESSURE RATING OF 100PSI AT 180°F.

DOMESTIC WATER PIPING SHALL BE TESTED IN ACCORDANCE WITH ALL GOVERNING CODES. PIPING SHALL BE PURGED OF DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION. PIPING TO B FLUSHED AND STERILIZED IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE HEALTH DEPARTMENT STANDARDS.

BALL VALVES SHALL BE TWO-PIECE BRONZE BODY, LARGE PORT WITH SOLID, SMOOTH BORE CHROME PLATED BRASS BALL. SEATS SHALL BE REINFORCED TFE WITH TEFLON PACKING RING AND THREADED ADJUSTABLE PACKING NUT. PROVIDE STEM EXTENSION AS NEEDED TO PROVIDE HANDLE ON OUTSIDE OF PIPE INSULATION. VALVES SHALL BE APOLLO 70 OR EQUAL.

BACKFLOW PREVENTERS SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS FOR EASE OF TESTING AND SERVICING. FOR BACKFLOW PREVENTERS WITH VENT CONNECTIONS, ROUTE VENT LINE TO NEAREST DRAIN AND DISCHARGE WITH AIR GAP. BACKFLOW PREVENTERS SHALL BE TESTED IN ACCORDANCE WITH APPLICABLE LOCAL CODES. CONTRACTOR SHALL PROVIDE CERTIFICATIONS THAT STATE DEVICES HAVE BEEN TESTED AND APPROVED.

THERMOMETERS SHALL BE 9" ADJUSTABLE ANGLE, 30"-180°F RANGE (TRERICE BX9 OR EQUAL), PRESSURE GAUGES SHALL BE 412" DIAL SIZE, 0-160PSI (TRERICE 600CB OR EQUAL).

WHERE INCOMING PRESSURE ON THE DOMESTIC WATER SERVICE EXCEEDS 80PSI, CONTRACTOR SHALL INSTALL A PRESSURE REGULATING VALVE (WATTS LF223) AND UPSTREAM STRAINER (WATTS LSF777). CONTRACTOR SHALL FIELD COORDINATE LOCATION OF ACCESSIBLE ISOLATION VALVES ON DOMESTIC HOT & COLD WATER SUPPLIES TO FIXTURES OR GROUPS OF FIXTURES SUCH THAT THEY MAY BE SHUT OFF FOR SERVICING. SERVICE AND HOSE BIBB VALVES SHALL BE IDENTIFIED. ALL OTHER VALVES INSTALLED IN LOCATIONS THAT ARE NOT ADJACENT TO THE FIXTURE(S) SHALL BE IDENTIFIED, INDICATING THE FIXTURE(S) SERVED.

## INSULATION

INSULATE ALL DOMESTIC HOT WATER PIPING REGARDLESS OF MATERIAL. WHERE RECIRCULATED HOT WATER IS SHOWN, INSULATE ALL HOT WATER AND RECIRCULATION PIPING WITH 1" THICK INSULATION PER CHAPTER 5 OF IECC. FOR NON-RECIRCULATED HOT WATER SYSTEMS, INSULATION THICKNESS SHALL BE AS FOLLOWS: PIPE UP TO 1"-1/2" THICK INSULATION. PIPE 1-1/4" TO 2": 1" THICK INSULATION.

INSULATE ALL HORIZONTAL COLD WATER PIPING LOCATED ABOVE CEILING. VERTICAL PIPING LOCATED IN AN EXTERIOR WALL, EXPOSED PIPING (MECH ROOMS), PIPE UP TO 1"-1/2" THICK. PIPING 1-1/4" AND OVER: 1" THICK INSULATION. INSULATION MAY BE OMITTED FOR HORIZONTAL CPVC PIPING LESS THAN 1'-1/2".

INSULATION SHALL HAVE A K-FACTOR (AVERAGE THERMAL CONDUCTIVITY) NOT TO EXCEED 0.27 BTU-IN/(HxSQFTx°F).

## TANK TYPE WATER HEATERS

WATER HEATERS SHALL BE U.L. LISTED AND SHALL MEET OR EXCEED THE STANDBY LOSS REQUIREMENTS OF U.S. DEPT. OF ENERGY AND CURRENT EDITION OF ASHRAE/IESNA 90.1.

WATER HEATERS SHALL HAVE 150PSI WORKING PRESSURE AND BE EQUIPPED WITH EXTRUDED HIGH DENSITY ANODE ROD AND HIGH TEMPERATURE CUTOFF SWITCH. WATER HEATERS SHALL BE THERMOSTATICALLY CONTROLLED AND SET TO 120° UNLESS OTHERWISE NOTED. WATER HEATERS SHALL BE INSTALLED ON SUSPENDED PLATFORM, STEEL STAND OR CONCRETE PAD, AS INDICATED ON DRAWINGS.

WATER HEATERS SHALL HAVE A MINIMUM 3 YEAR LIMITED WARRANTY.

WATER HEATERS SHALL BE INSTALLED LEVEL AND PLUMB. FIELD COORDINATE EXACT WATER HEATER LOCATION. MAINTAIN MANUFACTURER'S RECOMMENDED CLEARANCES, AND INSTALL SUCH THAT CONTROLS AND DEVICES ARE ACCESSIBLE FOR SERVICING.

INSTALL SHUTOFF VALVES IN COLD WATER INLET AND HOT WATER OUTLET. INSTALL THERMOMETER ON HOT WATER OUTLET. WATER HEATER SHALL HAVE ASME RATED COMBINATION TEMPERATURE AND PRESSURE RELIEF VALVE IN TOP PORTION OF TANK (FACTORY OR FIELD INSTALLED). PIPE RELIEF VALVE OUTLET TO FLOOR DRAIN, MOP SINK, INDIRECT WASTE RECEPTOR OR TO EXTERIOR. MAINTAIN CONTINUOUS DOWNWARD PITCH TOWARD DISCHARGE LOCATION, AND PROVIDE AIR GAP AT DISCHARGE LOCATION. WHERE WATER HEATER DRAIN PAN IS INDICATED ON PLANS, ROUTE DRAIN TO SAME LOCATION AS RELIEF VALVE AND DISCHARGE WITH AIR GAP.

## WATER HAMMER ARRESTERS

PROVIDE ON HOT AND COLD WATER BRANCHES TO FIXTURES, J. R. SMITH HYDROTROL MODEL 5020 FOR UP TO 60 FIXTURE UNITS. WATER HAMMER ARRESTERS SHALL CONFORM TO ASSE 1010.

## VALVES

GATE VALVE WATTS SERIES B-3000. CHECK VALVE WATTS SERIES B-5000. BALL VALVE WATTS SERIES B6080 OR B6081 FULL PORT. ALL VALVES 1/2" TO 2" BRONZE BODY. VALVES SHALL CONFORM TO NSF/ANSI 61.

## PRESSURE AND TEMPERATURE RELIEF VALVE

WATTS REGULATING CO. MODEL 10L. T&P RELIEF VALVE SHALL CONFORM TO ANSI Z21.22.

## PRESSURE REDUCING VALVE

WATTS SERIES 25AUB BRONZE BODY WITH INTEGRAL S/S STRAINER, SEALED CAGE FOR 1/2" TO 2 1/2" DIA. TO 300 PSI. PRESSURE REDUCING VALVE SHALL CONFORM TO ASSE 1003.

## PRESSURE GAUGE

AMETEK DIV. OF U.S. GAUGE SERIES P-500, UP TO 4-1/2" DIAL, 1/4" STEM, ALUMINUM CASE, BLACK FINISH.

## AIR VENT

HOFFMAN #79 WATER MAIN VENT VALVE.

## VACUUM RELIEF VALVE

WATTS MODEL N36-M1 BRASS BODY, 1/2" NPT LINE SIZE. VACUUM RELIEF VALVES SHALL CONFORM TO ANSI Z21.22.

## TRAP PRIMER

PRECISION PLUMBING PRODUCTS INC. MODEL P1-500 UP TO FOUR CONNECTIONS. OPTIONAL DISTRIBUTION UNIT REQUIRED FOR 2, 3 AND FOUR DRAIN LINES. TRAP PRIMER TO CONFORM TO ASSE 1016 OR ASSE 1044.

## MIXING VALVE

WATTS SERIES MMV MIXING VALVE, 1/2" LINE SIZE. MIXING VALVE SHALL CONFORM TO ASSE 1017.

## SPECIFIC PLUMBING SPECIFICATIONS

INSTALL NEW ONLY IF EXISTING DOES NOT MEET CURRENT ADA/CABO-ANSI (AS APPLICABLE) STANDARDS, OR IS DAMAGED, NOT IN WORKING ORDER OR NOT EXISTING AS APPLICABLE.

IT IS THIS CONTRACTOR'S RESPONSIBILITY TO SUPPLY HANDICAPPED TOILET FIXTURES, IF REQUIRED BY CODE OR NOTED ON THE DRAWINGS, UTILIZING THE SPECIFICATION ABOVE AS A STANDARD AND MEETING CODE REQUIREMENTS. SPACING OF FIXTURES TO BE COORDINATED WITH THE GENERAL CONTRACTOR AS WELL AS THE PLUMBING INSPECTOR'S REQUIREMENTS.

## LANDLORD'S CRITERIA

THE PLUMBING CONTRACTOR IS TO BECOME FAMILIARIZED WITH LANDLORD'S CRITERIA FOR THIS LOCATION AND INCLUDE ANY WORK REQUIRED OF THIS CRITERIA, WHICH IS NOT SPECIFICALLY NOTED IN THESE DRAWINGS AND SPECIFICATIONS.

## FIELD VERIFY ALL CONDITIONS

DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS.

THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTOR'S COST.

BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

CONTRACTOR TO CO-ORDINATE WITH ARCHITECT AND OWNER FOR FINAL LOCATION OF HOSE BIB IF ANY PROVIDE WATER SUPPLY CONNECTION AND ROUTE WITH ADEQUATE SIZE AS PER FILED CONDITIONS.

CONTRACTOR TO VERIFY IN FIELD AND CONNECT CONDENSATE DRAINS NEAR TO THE PLUMBING DRAINS AS PER LOCAL CODE REQUIREMENTS.

EXISTING PLUMBING FIXTURES TO BE DEMOLISHED AS SHOWN IN THE DEMOLITION PLAN AND EXISTING SANITARY VENT AND WATER TO BE DEMOLISHED AND SAME TO BE CAPPED AT FIXTURE

## SPRINKLER SYSTEM GENERAL NOTE:

EXISTING FIRE SPRINKLER SYSTEM IS TO BE REMAIN WITH EXISTING ACCESSORIES AND FITTINGS. GC TO FILED VERIFY THE EXISTING SPRINKLER HEAD LOCATIONS AND MODIFY AS PER THE UPDATED CEILING LAYOUT. EXTEND PIPE AND FITTINGS AS REQUIRED IN THE FILED AS PER THE LOCAL CODE REQUIREMENT. ALSO GC IS RESPONSIBLE FOR LAYING THIS OUT AND OBTAINING PERMITS.

## PLUMBING LEGENDS

	DOMESTIC COLD WATER PIPING (CW)
	DOMESTIC HOT WATER PIPING (HW)
	SANITARY PIPING (S)
	VENT PIPING (V)
	TOP CONNECTION, 45° OR 90°
	BOTTOM CONNECTION
	PIPE UP
	PIPE DOWN
	FLOOR CLEANOUT (PLAN / RISER VIEW) (PCO)
	BALL / GATE VALVE
	WALL CLEANOUT (PLAN / RISER VIEW) (WCO)
	FIELD CONNECTION
	DOMESTIC HOT WATER PIPING (RETURN/HRW)
	THERMOSTATIC MIXING VALVE (SET TO 110°F)
	TEMPERATURE & PRESSURE RELIEF VALVE
	WATER HAMMER ARRESTOR
	BALANCING VALVE
	HOT WATER CIRCULATING PUMP (HWCP)

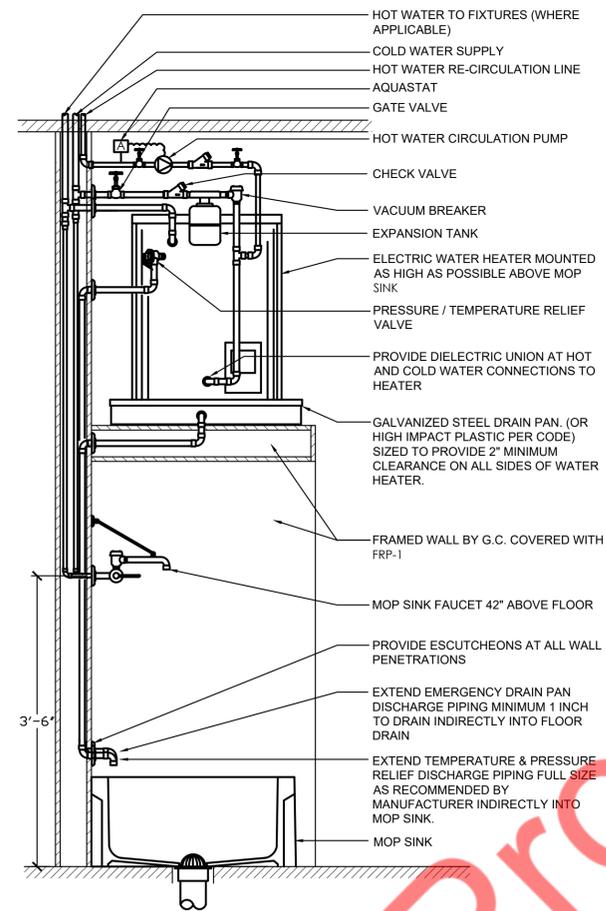
NOTE: SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS USED.

## ABBREAVTIONS

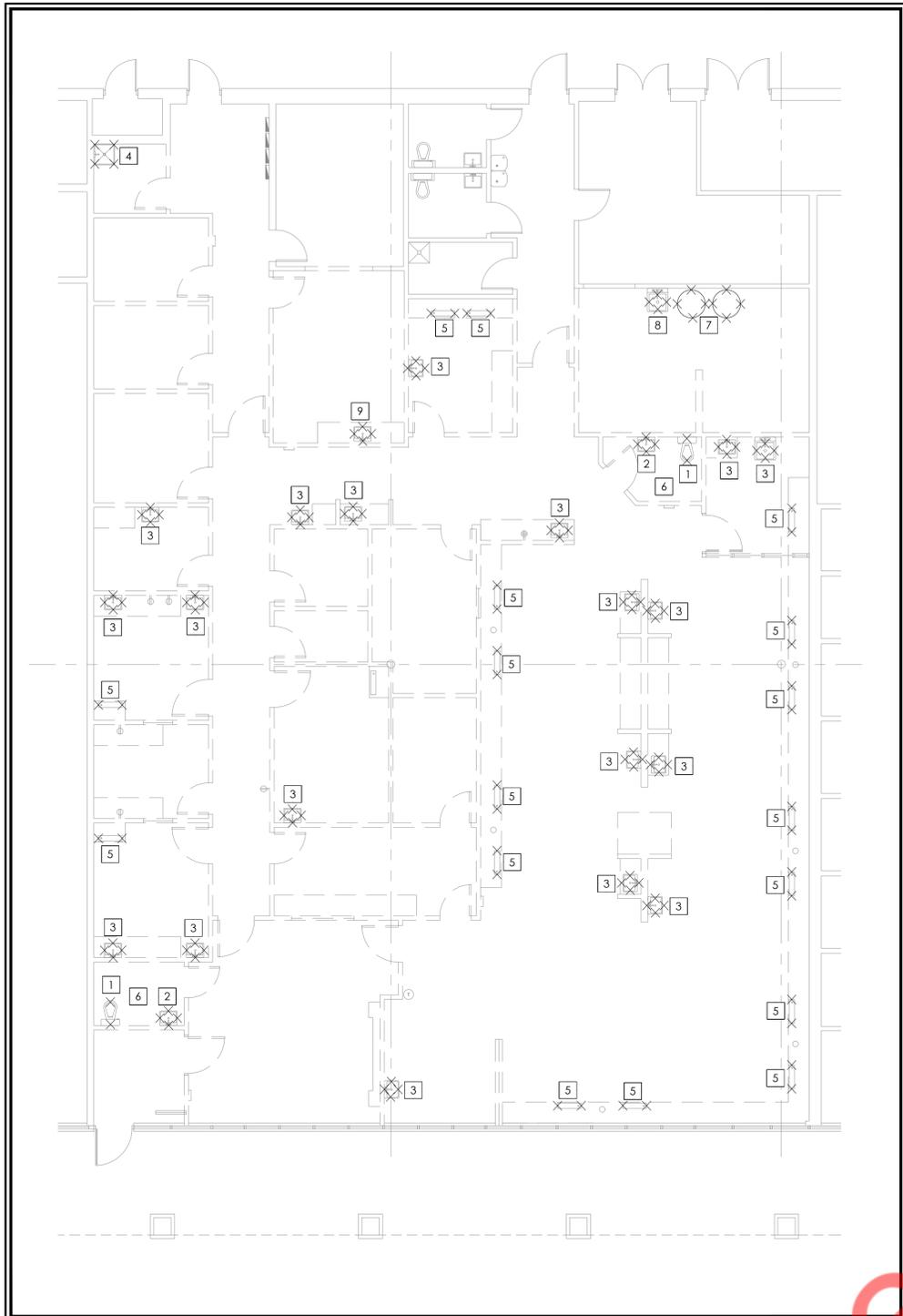
IDENTIFIER	DESCRIPTION
CW	COLD WATER
DN	DOWN
EQUIP	EQUIPMENT
EX / E	EXISTING
GC	GENERAL CONTRACTOR
HW	HOT WATER
HWR	HOT WATER RETURN
(N)	NEW FIXTURE/EQUIPMENT
S	SANITARY
V	VENT
V.F.	VERIFY IN FIELD
EWH	ELECTRIC WATER HEATER
ET	EXPANSION TANK
RCP	RE-CIRCULATION PUMP
WC	WATER CLOSET
LAV	LAVATORY
MS	MOP SINK
DF	DRINKING FOUNTAIN
SK	PANTRY SINK / SINK
BFP	BACKFLOW PREVENTER
FD	FLOOR DRAIN
G	GAS
RL	RELOCATED

MARK	DESCRIPTION	CW	HW	SAN	VENT	DESCRIPTION
EX.LAV	EXISTING LAVATORY	E	E	E	E	EXISTING TO REMAIN
EX.WC	EXISTING WATER CLOSET	E	--	E	E	EXISTING TO REMAIN
EX.MS	EXISTING MOP SINK	E	E	E	E	EXISTING TO REMAIN
EX.EWC	EXISTING WATER COOLER - BI-LEVEL	E	--	E	E	EXISTING TO REMAIN
SK	RELOCATED BREAK ROOM SINK	1/2"	1/2"	2"	1-1/2"	EXISTING SINK WITH MILLWORK TO BE RELOCATED TO THE NEW LOCATION AS SHOWN IN PLAN
EWH-1	ELECTRIC WATER HEATER	3/4"	3/4"	--	--	20-GALLON ELECTRIC WATER HEATER, 5 KW @ 208 V., A.O. SMITH DEL-20 OR EQUAL. PROVIDE DRAIN PAN UNDER SHELF-MOUNTED WATER HEATER. TERMINATE DRAIN LINE IN MOP SINK. PROVIDE FULL SIZE T&P RELIEF LINE, TERMINATE 2" ABOVE RIM LEVEL OF MOP SINK.
ET-1	EXPANSION TANK	3/4"	--	--	--	PROVIDE 2 GALLON AMTROL ST-5 EXPANSION TANK
RCP-1	RE-CIRCULATION PUMP	--	--	--	--	GRUNDFOS UP 15-10 B5, 1 GPM @ 5 FT HEAD

**1 PLUMBING FIXTURE SCHEDULE**  
SCALE: N.T.S.



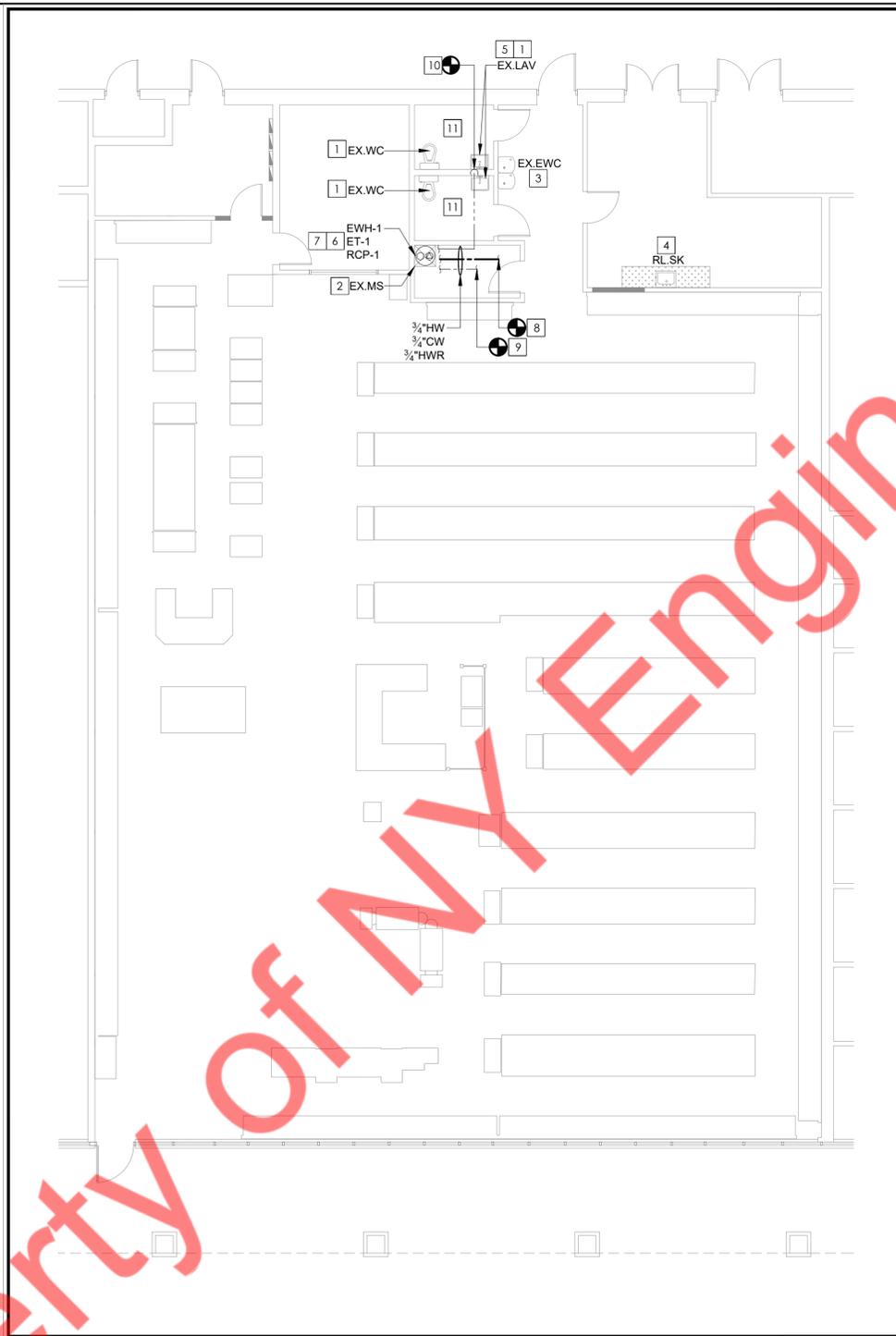
**2 WATER HEATER SCHEDULE**  
SCALE: N.T.S.



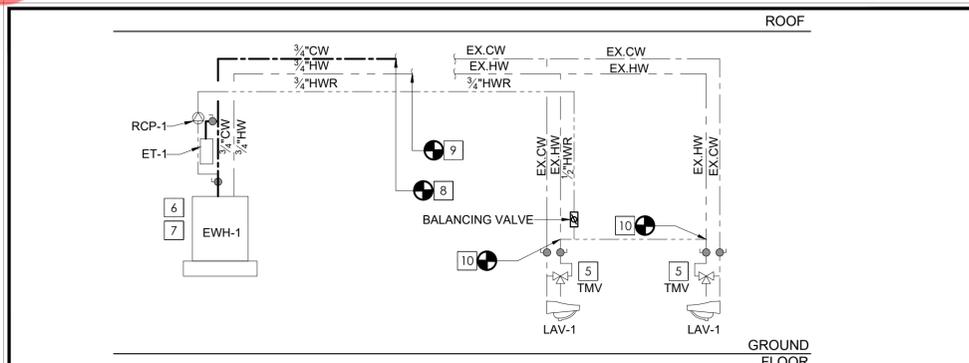
**1 PLUMBING DEMOLITION PLAN**  
SCALE: N.T.S.

1	EXISTING WATER CLOSET TO BE DEMOLISHED. EXISTING SANITARY, VENT AND WATER LINES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
2	EXISTING LAVATORY TO BE DEMOLISHED. EXISTING SANITARY, VENT AND WATER LINES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
3	EXISTING SINK TO BE DEMOLISHED. EXISTING SANITARY, VENT AND WATER LINES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
4	EXISTING MOP SINK TO BE DEMOLISHED. EXISTING SANITARY, VENT AND WATER LINES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
5	EXISTING DIALYSIS CONNECTION BOXES TO BE DEMOLISHED. EXISTING SANITARY, VENT AND WATER LINES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
6	EXISTING FLOOR DRAIN TO BE DEMOLISHED. EXISTING SANITARY AND VENT AND LINES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
7	EXISTING WATER HEATER, ASSOCIATED ACCESSORIES AND EQUIPMENTS TO BE DEMOLISHED. EXISTING SANITARY AND VENT PIPES TO BE DEMOLISHED AND SAME TO BE CAPPED AT MAIN LINES.
8	EXISTING SINK TO BE DEMOLISHED. EXISTING SANITARY, VENT AND WATER LINES TO BE REMAIN FOR NEW FIXTURE CONNECTIONS.
9	EXISTING BREAK ROOM SINK WITH MILL WORK TO BE RELOCATED AS MENTIONED IN THE ARCHITECTURAL PLAN. CONTRACTOR TO FILED VERIFY AND BASE BID ACCORDINGLY.

**2 PLUMBING DEMO KEYNOTES**  
SCALE: N.T.S.



**3 PLUMBING SANITARY AND WATER PLAN**  
SCALE: N.T.S.



**4 PLUMBING WATER RISER DIAGRAM**  
SCALE: N.T.S.

1	EXISTING WATER CLOSET AND LAVATORY TO BE REMAIN IN THE EXISTING LOCATIONS WITH THE EXISTING SANITARY, VENT AND WATER LINES WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO VERIFY IN FIELD, CONDITION OF EXISTING PIPING AND REPLACE IF PIPES ARE NOT IN GOOD CONDITION.
2	EXISTING MOP SINK TO BE REMAIN IN THE EXISTING LOCATIONS WITH THE EXISTING SANITARY, VENT AND WATER LINES WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO VERIFY IN FIELD, CONDITION OF EXISTING PIPING AND REPLACE IF PIPES ARE NOT IN GOOD CONDITION.
3	EXISTING DRINKING FOUNTAIN TO BE REMAIN IN THE EXISTING LOCATIONS WITH THE EXISTING SANITARY, VENT AND WATER LINES WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO VERIFY IN FIELD, CONDITION OF EXISTING PIPING AND REPLACE IF PIPES ARE NOT IN GOOD CONDITION.
4	CONNECT RELOCATED BREAK ROOM SINK TO THE EXISTING SANITARY, VENT AND WATER LINES WITH ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO VERIFY IN FIELD, LOCATION OF EXISTING PIPE CONNECTION, ROUTING AND SIZE.
5	PROVIDE THERMOSTATIC MIXING VALVE SET AT 110°F WITH RE-CIRCULATION LINE. IF DOES NOT IN EXISTING
6	NEW ELECTRIC HOT WATER HEATER EWH-1, RCP-1 AND ET-1 INSTALLED ABOVE MOP-SINK, REFER PLUMBING FIXTURE SCHEDULE.
7	CONTRACTOR SHALL DRAIN WATER HEATER, RELIEF VALVE, AND DRAIN PAN INDIRECTLY TO MOP SINK PER LOCAL CODE.
8	CONTRACTOR TO CONNECT NEW 3/4\"/>
9	CONTRACTOR TO CONNECT NEW 3/4\"/>
10	CONTRACTOR TO PROVIDE NEW 3/4\"/>
11	CONTRACTOR TO COORDINATE WITH CLIENT AND FILED VERIFY THE EXISTING SANITARY AND WATER MAIN LINES IN THE SPACE ARE IN GOOD CONDITION. REPLACE THE PIPES IF NOT IN GOOD CONDITION AND NOTIFY THE ENGINEER IF ANY DISCREPANCIES IN THE FILED PRIOR TO BID.

**5 PLUMBING SANITARY, VENT AND WATER KEYNOTES**  
SCALE: N.T.S.