MECHANICAL GENERAL NOTES

A. GENERAL CONDITIONS

1. DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND ALL OTHER SPECIFICATION SECTIONS (IF PROVIDED AS PART OF THE CONTRACT) ARE A PART OF THIS CONTRACT.
2. THE TERM "CONTRACTOR" SHALL MEAN THE "MECHANICAL CONTRACTOR HIRED TO COMPLETE THE WORK OUTLINED IN THESE PLANS AND SPECIFICATIONS", UNLESS OTHERWISE SPECIFIED.
3. THE CONTRACTOR FOR THIS WORK IS REQUIRED TO REVIEW ALL DRAWINGS FOR ALL OTHER TRADES.
4. 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 AND THE WORK AND INSPECTION OF THEIR SUBCONTRACTORS WITH ALL OTHER TRADES ON SITE TO CONFORM WITH THE GENERAL CONTRACTOR'S TIME SCHEDULE.
5. 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.
6. 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.
   A. 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 INTERSECTION(S) WITH OTHER EQUIPMENT/WORK (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.
7. 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.

B. GENERAL REQUIREMENTS

1. 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 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.
2. THE CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, SERVICES, TOOLS, TRANSPORTATION, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE COMPLETE AND FULLY FUNCTIONAL MECHANICAL SYSTEMS AS SHOWN ON THE DRAWINGS, 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.
3. 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.
4. 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.
5. THE CONTRACTOR SHALL OBTAIN AND COMPLY WITH DETAILED REQUIREMENTS OF LEASE EXTRACTS FROM THE LANDLORD AND TENANT.
6. COORDINATE LOCATIONS OF ALL AIR OUTLETS WITH ALL WALLS, LIGHTS, SPRINKLER HEADS, CEILING TILES AND DECORATIVE CEILING FIXTURES PRIOR TO INSTALLATION.
7. ALL MECHANICAL WORK SHALL BE INSTALLED SO AS TO BE READILY ACCESSIBLE FOR OPERATION, SERVICE, MAINTENANCE AND REPAIR. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SUFFICIENT ACCESS TO ALL EQUIPMENT FOR SERVICE.
8. THE CONTRACTOR SHALL DO ALL CUTTING, CORE DRILLING, CHASING, OR CHANNELING AND PATCHING REQUIRED FOR ANY WORK UNDER THIS CONTRACT. CUTTING SHALL HAVE PRIOR APPROVAL BY THE TENANT'S CONSTRUCTION MANAGER AND THE LANDLORD OR LANDLORD'S REPRESENTATIVE. PATCHING SHALL MATCH FINISH OF SURROUNDING AREA.

C. CODES

1. 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.

D. LICENSES, PERMITS, INSPECTIONS AND FEES

1. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL LICENSES, PERMITS, INSPECTIONS AND FEES REQUIRED OR RELATED TO THIS WORK.
2. FURNISH TO THE TENANT'S CONSTRUCTION MANAGER ALL CERTIFICATES OF INSPECTION AND FINAL INSPECTION APPROVAL AT COMPLETION OF PROJECT.

E. DRAWINGS

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

F. EXISTING LEASE SPACE CONDITIONS

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE DEMOLITION OF EXISTING MECHANICAL WORK IN THE SPACE NOT SHOWN TO BE REUSED IN THE NEW TENANT SPACE.
2. ACTIVE LANDLORD OR OTHER TENANT SERVICES ENCOUNTERED IN WORK SHALL BE PROTECTED AND SUPPORTED. IF EXISTING SERVICES NOT ANTICIPATED REQUIRE RELOCATION, CONTACT THE TENANT'S CONSTRUCTION MANAGER IMMEDIATELY. ALL COSTS FOR REPAIR OF DAMAGES TO ACTIVE LANDLORD OR OTHER TENANT SERVICES DURING CONSTRUCTION SHALL BE PAID FOR BY THE CONTRACTOR CAUSING THE DAMAGE.
3. TIE-INS AND MODIFICATIONS TO EXISTING LANDLORD SERVICES MUST BE DONE WITH MINIMUM INTERRUPTION OF LANDLORD OPERATION AND DURING HOURS SPECIFIED BY THE LANDLORD. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING EXACT WORKING HOURS OF THIS WORK WITH THE LANDLORD PRIOR TO SUBMITTING THEIR BID. THE CONTRACTOR SHALL INCLUDE IN THEIR BID, ALL PREMIUM TIME REQUIRED TO PERFORM MODIFICATIONS DURING OTHER THAN NORMAL WORKING HOURS. ALL SUCH WORK MUST BE COORDINATED WITH THE LANDLORD.
4. EQUIPMENT AND MATERIALS IN TRANSIT SHALL UTILIZE FREIGHT ELEVATOR OR STAIRS. SAID EQUIPMENT OR MATERIALS SHALL BE DISASSEMBLED AS REQUIRED TO MEET THE RESTRICTIONS IMPOSED BY THE BUILDING OR ITS COMPONENT CONSTRAINTS AND THEN REASSEMBLED IN THE NEW WORK AREA.
5. ALL WORK SHALL BE DONE WITH A MINIMUM OF NOISE AND DISTURBANCE TO BUSINESS ROUTINE. ALL WORK SCHEDULES SHALL BE COORDINATED WITH, AND APPROVED BY, THE TENANTS CONSTRUCTION MANAGER.
6. SINCE THESE ARE SECURE FLOORS, ALL DELIVERIES, WORKERS, WORK OPERATORS, ETC., REQUIRED BY THE CONTRACTOR FOR WORK PERFORMED IN ANY AREA OR SITE BUILDING SHALL BE IN STRICT CONFORMANCE TO THE RULES AND REGULATIONS OF THE OWNER.
7. CONTRACTOR SHALL PROTECT THEIR WORK AND EQUIPMENT FROM DAMAGE, VANDALS, ETC. ANY ITEM THAT IS DAMAGED, VANDALIZED OR STOLEN PRIOR TO ACCEPTANCE OF BUILDING BY OWNER AND ARCHITECT SHALL BE REPLACED BY RESPECTIVE CONTRACTOR AT NO CHARGE TO TENANT.
8. IT IS SPECIFICALLY THE INTENTION OF THIS SPECIFICATION TO HOLD THE CONTRACTOR RESPONSIBLE FOR ALL DAMAGE DONE TO ANY EXISTING FACILITIES, EQUIPMENT, PAINTING, OR ARCHITECTURAL AND STRUCTURAL FEATURES OF THE BUILDING, BY EITHER THEIR OWN WORKMEN OR BY ANY OF THEIR SUBCONTRACTORS. THE CONTRACTOR SHALL REPAIR ANY DAMAGE DONE BY THEIR OWN WORKMEN OR SUBCONTRACTORS AND THE OWNER AT THEIR DISCRETION, MAY WITHHOLD PAYMENTS EQUAL TO THE REASONABLE COST OF THE REPAIRS.
9. THIS CONTRACTOR OR THEIR WORKMEN SHALL NOT BE PERMITTED TO USE ANY PART OF THE EXISTING BUILDING AS A SHOP WITHOUT THE APPROVAL OF THE OWNER AND ARCHITECT.
10. WHERE THE WORK MAKES TEMPORARY SHUTDOWN OF SERVICES UNAVOIDABLE, THEY SHALL BE MADE AT NIGHT OR AT SUCH TIMES AS WILL CAUSE THE LEAST INTERFERENCE WITH THE ESTABLISHED OPERATING ROUTINE.
11. THIS CONTRACTOR SHALL ARRANGE THE WORK SO AS TO ASSURE THAT SERVICES WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTION TO THE EXISTING WORK. THIS CONTRACTOR SHALL GIVE AMPLE WRITTEN NOTICE IN ADVANCE TO THE OWNER OF ANY REQUIRED SHUT DOWN.
12. ALL MOTORS, FANS, CONTROLS, FIXTURES, HVAC UNIT, DUCTWORK AND OTHER EQUIPMENT FOR USE IN THIS CONTRACT SHALL BE PROTECTED BY TARPAULIN OR BY BOXING AS SOON AS DELIVERED TO THE SITE AND SHALL BE KEPT CLEAN AND DRY. THE MOTORS, UNITS, FIXTURES, FANS, DUCTWORK AND MOVING PARTS SHALL BE KEPT COVERED SO AS TO ELIMINATE DIRT, DUST AND OTHER MATERIALS ENTERING THE PARTS DURING ERECTION AND CONSTRUCTION WORK ON THE BUILDING. SHOULD IT BE FOUND THAT ANY PARTS ARE DAMAGED DUE TO CARELESSNESS ON THE PART OF THE CONTRACTOR IN NOT PROVIDING PROPER PROTECTION, SUCH PART OR PARTS SHALL BE REPLACED BY THE CONTRACTOR AT THEIR OWN COST AND EXPENSE. ALL OPENINGS IN DUCTS, PIPING, CONDUITS, ETC., SHALL BE PROPERLY PROTECTED WITH TEMPORARY CAPS OR PLUGS AT ALL TIMES.
13. THE CONTRACTOR, IN REGARDS TO ANY SAWCUTTING, COREDRILLING OR ANY PENETRATING OF A CONCRETE SLAB, FLOOR AND/OR ROOF, IS REQUIRED TO SURVEY DURING BIDDING TO DETERMINE ANY ISSUES, INCLUDING BUT NOT LIMITED TO, NECESSITY OF X-RAYING OF A CONCRETE SLAB, WHERE SUCH MATERIAL BEING PENETRATED IS NOT PROJECTED AND/OR ROUTED INTO A SPACE(S) THAT CREATES A NON-CODE COMPLIANT CONDITION, THE NEED FOR WEATHERSTRIPPING, WATERPROOFING OR OTHER CONDITION AND TO NOTIFY THE OWNER IF A PROBLEM(S) MAY EXIST AND TO INCLUDE COSTS TO SOLVE THE ISSUE UNCOVERED, IN ADDITION TO, NOTIFYING THE ARCHITECT OF RECORD REGARDING SUCH ISSUE(S).

G. DISCREPANCIES IN DOCUMENTS

1. 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 OR ARE UNCLEAR, ADVISE THE GENERAL CONTRACTOR IN WRITING, PRIOR TO SUBMITTAL OF BID. THE GENERAL CONTRACTOR IS RESPONSIBLE TO ADVISE THE TENANT'S CONSTRUCTION MANAGER, IN WRITING, OF VARIATIONS TO 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.

H. TRADE NAMES AND MANUFACTURERS

1. 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 BASE 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 CONTRACTOR'S EXPENSE.

I. SHOP DRAWINGS

1. SUBMIT THREE COPIES OF MATERIAL LISTS AND SHOP DRAWINGS FOR ALL EQUIPMENT AND DUCT FABRICATION DRAWINGS TO THE TENANT'S CONSTRUCTION MANAGER FOR REVIEW PRIOR TO ORDERING EQUIPMENT. SUBMISSIONS MUST BE EARLY ENOUGH TO ALLOW THE TENANT'S CONSTRUCTION MANAGER EIGHT WORKING DAYS FOR REVIEW WITHOUT CAUSING DELAYS OR CONFLICTS TO THE JOB'S PROGRESS. SUBMITTALS SHALL BE IN ACCORDANCE WITH THE GENERAL CONDITIONS USING THE MANUFACTURER'S LISTED ON THE DRAWINGS. SHOP DRAWINGS SHALL INCLUDE ALL DATA THAT PERTAINS TO THE REQUIREMENTS SET FORTH ON THE DRAWINGS AND IN THE SPECIFICATIONS. THE SUBMITTAL SHALL INCLUDE BUT NOT BE LIMITED TO CUTS OR CATALOGS INCLUDING DESCRIPTIVE LITERATURE AND CHARACTERISTICS OF EQUIPMENT SHALL SHOW MAJOR DIMENSIONS, ROUGHING-IN DATA, CAPACITY, CURVES, PRESSURE DROPS, CODE COMPLIANCE, MOTOR AND DRIVE DATA AND ELECTRICAL DATA. OBSERVE SPECIAL INSTRUCTIONS WHEN REQUIRED. SUBMITTALS SHALL BEAR THE STAMP OF THE GENERAL AND SUBCONTRACTOR SHOWING THAT HE HAS REVIEWED AND CONFIRMED THAT THEY ARE IN CONFORMANCE WITH THE CONTRACT DOCUMENTS OR INDICATE WHERE EXCEPTIONS TAKE PLACE. LACK OF SUCH CONTRACTOR'S REVIEW WILL BE CAUSE FOR REJECTION WITHOUT REVIEW BY TENANT'S CONSTRUCTION MANAGER. ALL SHOP DRAWINGS MUST APPEAR IN THE OPERATION AND MAINTENANCE MANUALS LEFT ON SITE AT JOB COMPLETION.
   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
      C.2. A CHANGE ORDER OR CONSTRUCTION CHANGE DIRECTIVE HAS BEEN ISSUED AUTHORIZING THE DEVIATION.
      C.3. 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.
2. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND / OR THEIR SUBCONTRACTORS TO FURNISH SHOP DRAWINGS AND SUBMITTALS ON ANY AND ALL EQUIPMENT, DUCT, DAMPERS, CONTROLS ETC. TO THE TENANT'S CONSTRUCTION MANAGER OR ARCHITECT FOR THEIR REVIEW PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOT BE RELIEVED OF RESPONSIBILITY FOR ERRORS, OMISSIONS OR OTHER DEFICIENCIES OR DEVIATIONS IN SHOP DRAWINGS, PRODUCT DATA, SAMPLES OR SIMILAR SUBMITTALS BY THE TENANT'S CONSTRUCTION MANAGER'S OR ARCHITECT'S APPROVALS THEREOF.

J. RECORD DRAWINGS

1. 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, ADDENDUM'S AND CHANGE ORDERS, SIGNIFICANT DEVIATIONS MADE NECESSARY BY FIELD CONDITIONS, APPROVED EQUIPMENT SUBSTITUTIONS AND CONTRACTOR'S COORDINATION WITH OTHER TRADES AND EXACT ROUTING OF ALL SANITARY AND DOMESTIC WATER PIPING UNDER FLOOR.
2. 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.

K. GUARANTEE, WARRANTY

1. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN THE PROPOSAL A ONE YEAR GUARANTEE, WARRANTY ON ALL EQUIPMENT AND MATERIAL INSTALLED OR REFURBISHED, ALL MATERIALS AND WORK UNDER THE CONTRACT AND SHALL MAKE GOOD, REPAIR, OR REPLACE AT THEIR OWN EXPENSE, ANY DEFECTIVE WORK, MATERIAL OR EQUIPMENT WHICH MAY BE DISCOVERED WITHIN A PERIOD OF 12 MONTHS FROM THE DATE OF WRITTEN ACCEPTANCE OF THE INSTALLATION BY THE TENANT'S CONSTRUCTION MANAGER. IN CASE OF REPLACEMENT OR REPAIR OF EQUIPMENT DUE TO FAILURE WITHIN THE GUARANTEE PERIOD, THE GUARANTEE ON THAT PORTION OF WORK SHALL BE EXTENDED FOR A PERIOD OF 12 MONTHS FROM THE DATE OF SUCH REPLACEMENT OR REPAIR. THIS GUARANTEE, WARRANTY IS TO INCLUDE ALL LABOR, MATERIAL, PARTS, ETC. NECESSARY TO MAINTAIN THE SYSTEM IN SATISFACTORY OPERATION FOR A PERIOD OF ONE YEAR STARTING FROM THE DATE OF ACCEPTANCE OF THE SYSTEM BY THE TENANT. IT SHALL ALSO INCLUDE ONE SUMMER TO WINTER CHANGEOVER AND ONE WINTER TO SUMMER CHANGEOVER, A NEW SET OF FILTERS AT THE TIME OF STARTUP AND TWELVE (12) MONTHLY FILTER CHANGES DURING THE FIRST YEAR. THE NORMAL PREVENTATIVE MAINTENANCE WORK SHALL BE PERFORMED AT THE TIME OF THE FILTER CHANGES. USE ONLY #40 PLEATED TYPE AIR FILTERS.

L. OPERATIONS MANUALS

1. 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.

M. SLEEVES

1. 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.
2. 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 RATING OF THE FLOOR OR WALL.
3. 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.
4. DUCT SLEEVES SHALL BE MINIMUM 14 GAUGE STEEL.

N. HANGERS

1. 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.
2. 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 SUSPENDED 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 INTERFERENCE'S OCCUR, IN ORDER TO SUPPORT DUCTWORK OR PIPING, THE CONTRACTOR MUST INSTALL TRAPEZE TYPE HANGERS OR SUPPORTS WHICH SHALL BE LOCATED WHERE THEY DO NOT INTERFERE WITH ACCESS TO FIRE DAMPERS, VALVES, ACCESS DOORS AND OTHER EQUIPMENT SERVICE REQUIREMENTS AND/OR OTHER TRADES. HANGER TYPES AND INSTALLATION METHODS ARE SUBJECT TO LANDLORD CRITERIA.
3. HANGERS FOR ALL INSULATED PIPING SHALL BE SIZED AND INSTALLED FOR THE OUTER DIAMETER OF INSULATION. INSTALL 6 INCH LONG SPLIT CIRCLE GALVANIZED SADDLE BETWEEN THE HANGER AND THE PIPE INSULATION.
4. HANGERS AND PIPING OF DISSIMILAR METALS SHALL BE DI-ELECTRICALLY SEPARATED FROM ONE ANOTHER.

O. ACCESS DOORS

1. 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.
2. ACCESS DOORS LOCATED IN FIRE-RATED WALLS, FLOORS, CEILING-FLOOR, OR CEILING-ROOF ASSEMBLIES SHALL BE FIRE RATED, U.L. LISTED AND LABELED.
3. 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 PINS 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' x 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.

P. ELECTRIC MOTORS

1. 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.
2. DESIGN, CONSTRUCTION AND PERFORMANCE CHARACTERISTICS OF MOTORS SHALL CONFORM TO ALL APPLICABLE PROVISIONS OF LATEST NEMA, ANSI, ISEE STANDARDS FOR ELECTRICAL EQUIPMENT. ALL MOTORS SHALL BE SUITABLE FOR OPERATION ON VOLTAGE VARIATION OF PLUS OR MINUS 10 PERCENT, 40 DEGREES C AMBIENT TEMPERATURE AND HAVE A SERVICE FACTOR OF NOT LESS THAN 1.15.

Q. LOW VOLTAGE (24 VOLT) WIRING

1. 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.
2. ALL WORK IS TO CONFORM TO THE ELECTRICAL SPECIFICATIONS AND THE REQUIREMENTS OF THE AUTHORITIES HAVING JURISDICTION.
3. ANY CONDUIT REQUIRED BY CODE OR THE LANDLORD WILL BE INSTALLED BY THE ELECTRICAL SUBCONTRACTOR.
4. SMOKE DETECTORS AND REMOTE TEST STATION:
   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.
   B. SMOKE DETECTORS SHALL HAVE THEIR OWN REMOTE KEY TEST STATION SYSTEM WITH AUDIBLE AND VISUAL ALARM, SIMPLEX MODEL 4098-9842 OR APPROVED EQUIVALENT. ALARM TO HAVE CANDELA SETTING OF 75 AND A HIGH VOLUME HORN TONE SETTING.
   C. ALARM SYSTEM MAY BE DELETED WHERE NOT REQUIRED BY LANDLORD OR BY LOCAL CODE.

--SPECIFIC NOTES --

A. HEATING, VENTILATION AND AIR CONDITIONING

1. BEFORE STARTING WORK, THIS CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, STRUCTURAL, MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS TO SEQUENCE, COORDINATE AND INTEGRATE THE VARIOUS ELEMENTS OF THE HVAC SYSTEM, MATERIALS AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID INTERFERENCE'S AND CONFLICTS.

B. HVAC EQUIPMENT (REFER TO PLANS FOR SCHEDULE OF EQUIPMENT)

1. PRIMARY HVAC UNITS ARE TO BE AS SCHEDULED. EQUIVALENTS MAY BE SUBSTITUTED WITH WRITTEN APPROVAL ONLY. ALL COMPRESSORS ARE TO INCLUDE A 5 YEAR EXTENDED WARRANTY.
2. 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.
3. 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.
4. 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.

C. TOILET EXHAUST FANS

1. WHERE SHOWN ON DRAWINGS PROVIDE A TOILET EXHAUST FAN COMPLETE WITH GRAVITY BACKDRAFT DAMPER. ALL DUCTWORK, ROOF OPENINGS AND CAPS NECESSARY TO PROVIDE A COMPLETE EXHAUST SYSTEM SHALL BE PROVIDED BY THE CONTRACTOR. REFER TO PLANS FOR APPLICABILITY.

D. VIBRATION ISOLATION DEVICES

1. 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.
2. 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.
3. EXAMINE DEAD LOAD AND OPERATING LOAD CONDITIONS WHEN SELECTING DEVICES. ADJUST FOR PROPER ALIGNMENT AND LOADING. AVOID "GROUNDING" THE ISOLATOR.
4. CHECK HANGER ROD SIZE FOR ALLOWABLE LOADS AT THE ISOLATING DEVICE AND THE UPPER AND LOWER ATTACHMENTS TO STRUCTURES, DUCTS, EQUIPMENT, ETC.
5. CONSULT MANUFACTURER FOR APPLICATION DATA.

E. CURBS AND STEEL FRAMING FOR SUPPORT

1. 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 MANUFACTURER AS THE EQUIPMENT SUPPORTED. INSULATE UNDER THE COMPRESSOR 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 ROOFTOP EQUIPMENT SHALL BE INSIDE THE CURB (CONDENSATE DRAIN, POWER WIRING, CONTROL WIRING, ETC.).

F. METAL DUCTWORK - NO FIBERGLASS DUCT ALLOWED

1. NO DUCTWORK SHALL BE FABRICATED PRIOR TO APPROVAL BY THE TENANT'S CONSTRUCTION MANAGER. DEVIATIONS 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.
2. 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, TIE ROD APPLICATIONS AND JOINT TYPES AND INTERVALS. ALL SQUARE ELBOWS SHALL BE PROVIDED WITH DOUBLE WALLED VANES ON MAXIMUM 3" CENTERS. PROVIDE SEAL CLASS "C" ON ALL TRAVERSE JOINTS UNLESS SUPERSEDED BY MORE STRINGENT LOCAL CODES. ALL DUCT CONNECTIONS ARE TO BE RIGID AND LEAK FREE ASSEMBLIES.
3. 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 DIFFUSER OR REGISTER TO AVOID DIRT OR OTHER CONTAMINANTS FROM ENTERING THE SYSTEM.
4. 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. REMAKE 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.
5. AS A MINIMUM, CROSSBREAK ALL FLAT SURFACES OR REINFORCE WITH A BEAD APPROXIMATELY 3/8 INCH WIDE BY 3/16 INCH DEEP ON 12 INCH CENTERS TO PREVENT VIBRATIONS.
6. 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.
7. WHERE DUCTS PASS THROUGH ROOFS, FLOORS AND FIRE RATED PARTITIONS, PROVIDE AS MINIMUM 1-1/2 INCH BY 1-1/2 INCH BY 1/8 INCH STEEL ANGLE FRAMES AT EACH SIDE OF OPENING. THE ANNULAR SPACE BETWEEN DUCT AND ANGLE FRAMES SHALL BE CAULKED WITH SILICONE SEALANT OR FIREPROOFED AS REQUIRED BY THE ASSEMBLY FIRE RATING. CONTRACTOR TO PROVIDE FIRE OR COMBINATION FIRE / SMOKE DAMPERS AT EACH PENETRATION WHERE REQUIRED BY CODE.
8. 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.
9. SOFT ELASTOMER BUTYL GASKETS WITH ADHESIVE BACKING SHALL BE USED TO SEAL FLANGED JOINTS.
10. DUCT TRANSITIONS SHALL NOT EXCEED 30 DEGREES SLOPE EXCEPT AS SPECIFICALLY NOTED OTHERWISE.
11. PROVIDE ACCESS TO ALL MOTORIZED DAMPERS, FIRE DAMPERS, FIRE / SMOKE DAMPERS, CONTROLS AND OTHER ITEMS IN DUCTWORK THAT REQUIRE SERVICE OR INSPECTION. IF THE ACCESS PANEL LOCATION IS EXPOSED TO THE SALES AREA, IT MUST BE APPROVED BY THE TENANT'S CONSTRUCTION MANAGER PRIOR TO INSTALLATION. LAY-IN SUPPLY AND RETURN AIR DIFFUSERS, GRILLES AND REGISTERS WITH PLASTER FRAMES MAY BE USED AS ACCESS LOCATIONS.
12. ALL BRANCHES AND TAKEOFFS SHALL BE EQUIPPED WITH MANUAL VOLUME CONTROLLING DEVICES HAVING AN INDICATING AND LOCKING DEVICE.

G. FLEXIBLE CONNECTIONS

1. 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 DUCTS OR CASINGS. ALSO PROVIDE FLEXIBLE CONNECTIONS WHERE DUCTS CROSS BUILDING EXPANSION JOINTS.
2. FLEXIBLE CONNECTIONS SHALL BE CONSTRUCTED OF NEOPRENE-COATED FLAMEPROOF FABRIC. PROVIDE ADEQUATE JOINT FLEXIBILITY TO ALLOW FOR MOVEMENT AND PREVENT THE TRANSMISSION OF VIBRATION.
3. FLEXIBLE CONNECTIONS ARE TO BE RATED FOR THE OPERATING PRESSURE OF THE SYSTEM.
4. 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.

H. THERMOSTATS

1. 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.

I. FIRE DAMPERS, SMOKE DAMPERS

1. 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.
2. FIRE DAMPERS SHALL HAVE THE BLADES OUT OF THE AIR STREAM AND A 165- DEGREE 'F' FUSIBLE LINK.
3. PROVIDE ALL NECESSARY FRAMING AND SLEEVES FOR DAMPER MOUNTING PER UL AND CODE REQUIREMENTS.
4. 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.
5. WHERE REQUIRED BY LOCAL CODES, LANDLORD AND IF INDICATED ON DRAWINGS, PROVIDE UL555S SMOKE DAMPER WITH FIRE / HEAT / SMOKE SENSOR, REVERSIBLE MOTOR AND INTERLOCK WITH FIRE ALARM SYSTEM.

J. FLEXIBLE AIR DUCT

1. FLEXIBLE DUCT FOR CONNECTIONS SHALL BE A FACTORY FABRICATED ASSEMBLY CONSISTING OF AN INNER SLEEVE, INSULATION AND AN OUTER MOISTURE 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 BI-DIRECTIONAL REINFORCED METALIZED VAPOR BARRIER. THE FLEXIBLE DUCT SHALL BE RATED FOR A MAXIMUM WORKING VELOCITY OF 6000 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 THERMAFLEX M-KC OR APPROVED EQUIVALENT. FLEXIBLE DUCT SHALL ROUTE FROM SHEET METAL DUCTWORK TO CEILING DIFFUSERS ONLY. THERE SHALL BE NO EXPOSED FLEXIBLE DUCT.
2. FLEXIBLE AIR DUCT MAY ONLY BE USED IN VERTICAL APPLICATIONS WITH PRIOR APPROVAL FROM THE TENANT'S CONSTRUCTION MANAGER.
3. FLEXIBLE DUCT SHALL NOT EXTEND OVER 5 FEET IN LENGTH AT ANY ONE LOCATION.

K. SUPPLY AND RETURN AIR TAKEOFF FITTINGS

1. RECTANGULAR DUCT
   A. PROVIDE 45-DEGREE RECTANGULAR TAKEOFFS FROM MAIN DUCTWORK TO RECTANGULAR BRANCHES.
2. SPIRAL DUCT
   A. 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.

L. DAMPERS

1. PROVIDE MANUAL LOCKING QUADRANT VOLUME CONTROL DAMPERS WITH HANDLE OPERATORS IN EACH BRANCH DUCT AND AS SHOWN ON PLANS TO FACILITATE AIR BALANCING.
2. WHERE ACCESS TO BALANCING DAMPER IS RESTRICTED OR IN AREAS WITH SHEET ROCK CEILINGS, YOUNG REGULATORS SHALL BE USED.
3. ALL RECTANGULAR DAMPERS IN OUTSIDE AIR AND RELIEF AIR DUCTS ARE TO BE OPPOSED BLADE TYPE. ALL RECTANGULAR DAMPERS IN RETURN AIR DUCTS TO BE PARALLEL BLADE TYPE. ALL OUTSIDE AIR DUCT DAMPERS MUST ALSO BE OF THE LOW LEAKAGE TYPE.
4. ALL MOTORIZED DAMPERS NOT FURNISHED WITH EQUIPMENT ARE TO BE HONEYWELL DAMPERS.

M. DIFFUSERS, GRILLES AND REGISTERS

1. PROVIDE DIFFUSERS, GRILLES AND REGISTERS AS SCHEDULED. DEVICES TO BE COMPLETE WITH FRAMES AND ALL ACCESSORIES. ALL DIFFUSERS, GRILLES AND REGISTERS IN SHEET ROCK CEILINGS TO BE PROVIDED WITH PLASTER FRAMES. FINISH TO BE COORDINATED WITH INTERIOR FINISHES.
2. INSTALL ALL AIR DEVICES AS LOCATED ON THE ARCHITECTURAL REFLECTED CEILING PLAN OR THE MECHANICAL PLAN.

N. DUCTWORK INSULATION

1. ALL NEW SUPPLY AND RETURN AIR DUCTWORK WITHIN 10' OF HVAC UNIT SHALL BE ACOUSTICALLY LINED. DUCT SIZES SHOWN ON THE DRAWING ARE INTERNAL FREE AREA SIZES. INTERNAL LINER SHALL BE 1-INCH THICK DUCT LINER EQUIVALENT TO JOHNS MANVILLE "PERMACOTE LINACOUSTIC" ("R VALUE" = 6) AND SHALL BE APPLIED TO THE DUCTWORK WITH FIRE RESISTIVE ADHESIVES AND CADMIUM OR COPPER PLATED MECHANICAL FASTENERS.
2. ALL OUTSIDE AIR AND UNEXPOSED DUCTWORK WITHIN BUILDING, EXCEPT WHERE ACOUSTICALLY LINED, SHALL HAVE 2-INCH, FIBERGLASS DUCT WRAP INSULATION WITH FSK FACING EQUIVALENT TO JOHNS MANVILLE "MICROLITE XG TYPE 75" (INSTALLED "R VALUE" = 6).
3. MINIMUM INSULATION REQUIREMENTS AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2018:

	SUPPLY	RETURN
UNCONDITIONED SPACES WITHIN BUILDING:	R-6	R-6
WITHIN BUILDING ENVELOPE ASSEMBLY:	R-8	R-8
OUTSIDE OF BUILDING:	R-8	R-8

4. 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.
5. ALL INSULATION ON EXISTING PIPING OR DUCTS THAT BECOMES WET, DAMAGED, DISTURBED OR GETS REMOVED SHALL BE REPLACED.
6. INSTALL INSULATION PRODUCTS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES. INSULATION MUST COMPLY WITH NFPA 90A.
7. 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.
8. EXTERIOR SUPPLY AND RETURN DUCT INSULATION:
   A. SERVICE: RECTANGULAR, SUPPLY-AIR AND RETURN-AIR DUCTS.
      A.1. MATERIAL: INSULATION BOARD, 6 PSF MINIMUM AND PLAIN FACING.
      A.2. THICKNESS: 2 INCHES.
      A.3. NUMBER OF LAYERS: TWO.
      A.4. TOTAL THICKNESS = 4".
      A.5. VAPOR RETARDER REQUIRED: YES.
   B. INORGANIC GLASS FIBERS PREFORMED AND BONDED BY THERMOSETTING RESIN. MUST COMPLY WITH ASTM C 612, TYPE 1A & 1B, KNAUF INSULATION OR APPROVED EQUIVALENT.
   C. INSULATION INSTALLED OUTDOORS: FLAME SPREAD RATING OF 25 OR LESS AND SMOKE DEVELOPED RATING OF 50 OR LESS.
8. APPLY INSULATION AS FOLLOWS:
   A. 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.
   B. ON EXPOSED APPLICATIONS, FINISH INSULATION WITH A SKIM 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. THIN THE FINISH COAT TO ACHIEVE SMOOTH FINISH. OUTDOOR JACKET: POLYGUARD PRODUCTS, INC. 'ALUMAGUARD 60' OR MFM BUILDING PRODUCTS CORP. 'FLEXCLAD 400'.

O. SYSTEM CLEANOUT

1. UPON COMPLETION OF INSTALLATION, CLEAN ENTIRE SYSTEM BEFORE INSTALLING AIR OUTLETS. CONTRACTOR TO PROVIDE A CERTIFICATION THAT CLEANING WAS ACCOMPLISHED PRIOR TO PROJECT CLOSEOUT.
2. FILTERS MUST BE IN UNITS AT ANY TIME FANS ARE OPERATED.

P. SYSTEM TESTING, ADJUSTING AND BALANCING

1. TESTING, ADJUSTING AND BALANCING OF ALL WORK SHALL BE COMPLETED BY AN INDEPENDENT CONTRACTOR WHO IS CURRENTLY LICENSED BY THE ASSOCIATED AIR BALANCING COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). NO OTHER BALANCE REPORTS WILL BE REVIEWED OR ACCEPTED. ALL BALANCING WORK MUST BE COMPLETE AND DONE IN ACCORDANCE WITH THE MOST RECENT STANDARDS OF THEIR SOCIETY. PAYMENT OF ALL COSTS FOR TESTING SHALL BE MADE BY THE HVAC CONTRACTOR.
2. THE CONTRACTOR SHALL INSTALL NEW FILTERS IN ALL UNITS PRIOR TO THE AIR BALANCING. THE COMPLETE AIR BALANCE SHALL TAKE PLACE WITH OUTSIDE AIR DAMPERS IN MINIMUM POSITION.
3. BALANCE AIR AND WATER QUANTITIES TO WITHIN PLUS OR MINUS 5 PERCENT OF THAT INDICATED ON THE DRAWINGS. ANY REQUIRED CHANGES IN SHEAVES, BELTS, PULLEYS OR THE ADDITION OF DAMPERS REQUIRED TO ACHIEVE SPECIFIED FLOW RATES SHALL BE PROVIDED BY THE HVAC CONTRACTOR WITH NO ADDITIONAL COST TO THE TENANT.
4. THE BALANCE REPORT SHALL INCLUDE AS A MINIMUM THE FOLLOWING INFORMATION:
   A. AABC OR NEBB CERTIFICATION NUMBER AND SIGNATURE OF BALANCING CONTRACTOR.
   B. INSTRUMENTATION LIST WITH LAST CALIBRATION DATES.
   C. MAKE AND MODEL NUMBERS OF ALL HVAC EQUIPMENT TESTED.
   D. AIR CFM AND STATIC PRESSURE READINGS (DISCHARGE AND SUCTION) AS MEASURED BY PITOT TUBE DUCT TRAVERSE AT THE UNITS.
   E. MOTOR NAMEPLATE DATA WITH ACTUAL FIELD VOLTAGE AND AMPERAGE READINGS FOR EACH LEG.
   F. MOTOR AND FAN RPM, SHEAVE SIZES AND BELT SIZES AND LENGTHS.
   G. OUTSIDE, RETURN, MIXED AND SUPPLY AIR TEMPERATURES AT FULL COOLING.
   H. MAKE AND MODEL NUMBERS OF ALL AIR DISTRIBUTION EQUIPMENT.
   I. FINAL BALANCED AIR VOLUMES AT ALL OUTLETS (INCLUDING RETURNS WHERE DUCTED).
   J. INDEXED PLAN WITH DIFFUSER AND RETURN LOCATIONS.
5. ALL CONTROL SEQUENCES SHALL BE TESTED AND OPERATING STATUS RECORDED IN THE REPORT.
6. THREE COPIES OF THE BALANCE REPORT SHALL BE SUBMITTED THROUGH THE GENERAL CONTRACTOR TO THE TENANT'S CONSTRUCTION MANAGER FOR REVIEW AND COMMENT.
7. THE BALANCING CONTRACTOR SHALL PERFORM ALL APPLICABLE TESTING AND BALANCING FUNCTIONS REQUIRED FOR THE SYSTEM DESIGNED IN THESE DRAWINGS. THE BALANCING CONTRACTOR SHALL RECHECK ANY ITEMS THAT THE TENANT DEEMS NECESSARY AT NO ADDITIONAL COST TO THE TENANT.
8. FINAL BALANCE REPORT SHALL BE INCLUDED IN THE OPERATION AND MAINTENANCE MANUAL.

Q. FINAL HVAC INSPECTIONS

1. ASIDE FROM NORMAL INTERIM INSPECTIONS OF WORK IN PLACE, THE TENANT SHALL HAVE THE RIGHT TO HAVE 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.

R. INDOOR AIR QUALITY

1. NO ANALYSIS HAS BEEN MADE WITH REGARD TO SOURCES OR POTENTIAL SOURCES OF INDOOR OR OUTDOOR AIR CONTAMINANTS OR LEVELS OF CONTAMINATION.
2. 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.
3. 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.
4. 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.
5. CONTRACTOR TO INSTALL TEMPORARY EXHAUST SYSTEM TO VENTILATE CONSTRUCTION SITE AND KEEP SITE UNDER SLIGHT NEGATIVE PRESSURE DURING ALL HOURS OF CONSTRUCTION, EVEN IF AFTER NORMAL BUSINESS HOURS.
6. CONTRACTOR TO INSTALL TEMPORARY BARRIERS TO PROTECT ADJACENT SPACES FROM DUST, PARTICULATES, VAPORS AND NOISE. WHERE TEMPORARY BARRIERS ARE INSTALLED ALWAYS MAINTAIN FIRE EXITS AND EXITWAYS.

THERMOSTATIC CONTROLS:

A. GENERAL:

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

EXCEPTION:

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:

1. 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).
2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.

B. DEAD BAND:

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.

EXCEPTIONS:

1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.

C. OFF-HOUR CONTROLS:

EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.

EXCEPTIONS:

1. ZONES THAT WILL BE OPERATED CONTINUOUSLY.
2. ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A READILY ACCESSIBLE MANUAL SHUTOFF SWITCH.

D. AUTOMATIC SETBACK AND SHUTDOWN:

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 OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

E. SETPOINT OVERLAP RESTRICTION:

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 C403.4.1.2.

F. AUTOMATIC START:

AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY IN ACCORDANCE WITH SECTION C403.4.2.3

TEMPE CITY BUILDING DEPARTMENT NOTES

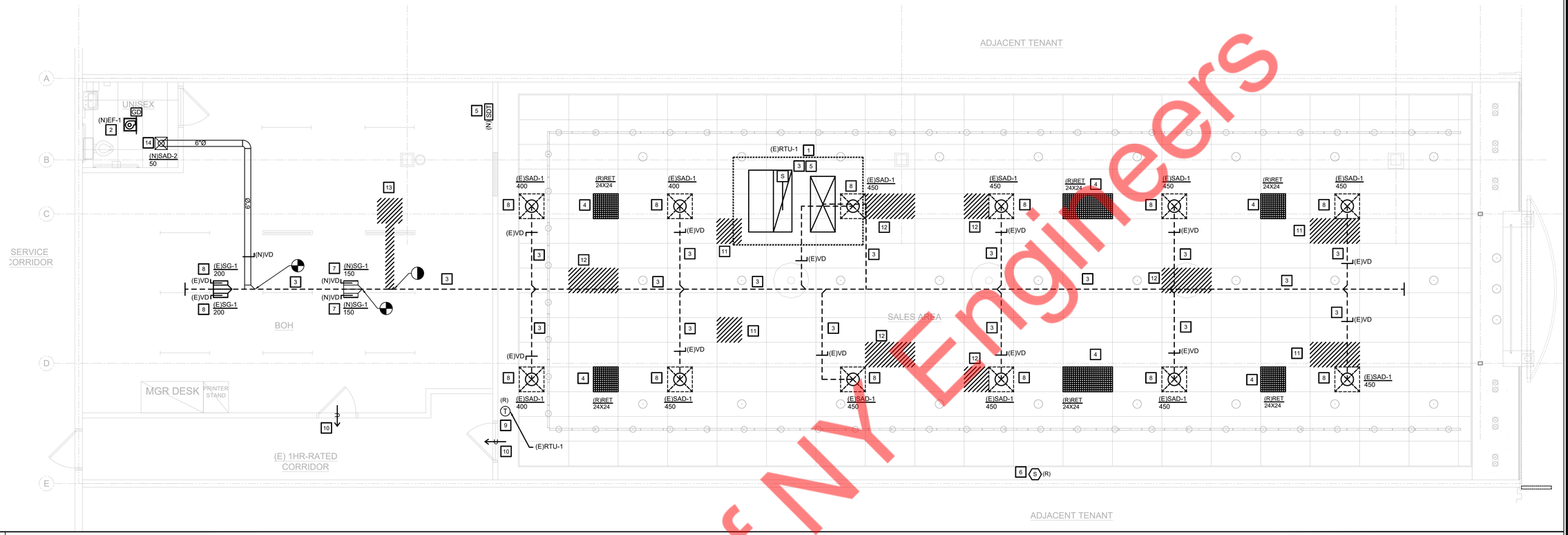
ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE 2018 INTERNATIONAL BUILDING CODE, AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
2. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2018 INTERNATIONAL MECHANICAL CODE CHAPTER 4.
3. AS PER 408.2.5 OF 2018 INTERNATIONAL ENERGY CONSERVATION CODE, 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.
4. AS PER 408.3.2 OF 2018 INTERNATIONAL ENERGY CONSERVATION CODE, 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.
5. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2018 INTERNATIONAL BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION [BC 1704].
6. 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.
7. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 2018 INTERNATIONAL MECHANICAL CODE:
   A. VENTILATION SYSTEM BALANCING IMC 2018 - 403.3.1.5
   B. SMOKE CONTROL SYSTEMS - IMC 2018 - 513.3
8. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING -IMC 2018 - 309.1
   B. DUCT CONSTRUCTION AND INSTALLATION-IMC 2018 - 603
   C. AIR INTAKES, EXHAUSTS AND RELIEF - IMC 2018 - 401.5 & 501.3
   D. AIR FILTERS - IMC 2018 - 605
   E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS - IMC 2018 - 513
   F. GAS FIRED EQUIPMENT - FUEL GAS CODE
9. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
10. VENTILATION FOR ALL AREA SHALL COMPLY WITH IMC 2018-401.
11. 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 IMC 2018 - 403.3
12. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION IMC 2018 - 606 TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.
13. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION & PROVIDE FIRE DAMPER FOR DUCT PENETRATING THOSE WALLS.
14. 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.
15. A MECHANICAL SYSTEM SHALL BE COMMISSIONED AS PER 2018 IECC 408.2.4, 408.2.5.2, 408.2.1, 408.2.5.1.
16. A COMMISSIONING PLAN SHALL BE DEVELOPED BY LICENSED DESIGN PROFESSIONAL, MECHANICAL ENGINEER OR APPROVED AGENCY.
17. PRELIMINARY REPORT OF COMMISSIONING TEST PROCEDURES AND RESULTS SHALL BE COMPLETED & CERTIFIED BY LICENSED DESIGN PROFESSIONAL, ELECTRICAL ENGINEER, MECHANICAL ENGINEER OR APPROVED AGENCY & PROVIDED TO THE BUILDING OWNER OR OWNER'S AUTHORIZED AGENT AS PER IECC 2018, 408.2.4.

FILTERS MUST BE CHANGED AND ALL DUCT DETECTORS, IF EXISTING, MUST BE CLEANED WHEN YOUR BUILD-OUT CONSTRUCTION IS COMPLETED

ALL PENETRATIONS OF FIRE RATED CONSTRUCTION MUST BE RENEWED PER MANUFACTURER'S DETAILS OF THE SEALANT. THE DETAILS SHALL MEET OR EXCEED RATINGS OF CONSTRUCTION BEING PENETRATED. PENETRATION DETAILS SHALL BE EXACTLY AS TESTED BY AN APPROVED TESTING LABORATORY OR AGENCY AND SHALL INCLUDE THEIR SYSTEM NUMBERS.

TENANT SHALL SECURE A CONTRACT FOR FACTORY RECOMMENDED MAINTENANCE AND SERVICE OF THE HVAC UNITS SERVING THE PREMISES. A COPY OF THIS CONTRACT MUST BE DELIVERED TO THE LANDLORD'S ON-SITE MANAGEMENT STAFF PRIOR TO STORE OPENING.



1 MECHANICAL PLAN
1/4" = 1'-0"

NEW EXHAUST FAN / LIGHT COMBO SCHEDULE

TAG	SERVES	FAN TYPE	AIRFLOW (CFM)	E.S.P. ("W.C.")	SONES	MOTOR			ELECTRICAL			WEIGHT (LBS)	MANUFACTURER/ MODEL #
						HP	RPM	DRIVE	V/Ø/HZ	MCA	MOCP		
(N)EF-1	TOILET ROOM	CEILING	75	0.2	4.1	-	1380	DIRECT	120/1/60	1.5	15	7.1	BROAN / HD80L

NOTES & ACCESSORIES:
1. PROVIDE FAN WITH GRILLE, VIBRATION ISOLATORS, DISCONNECT SWITCH, INTEGRAL BACKDRAFT DAMPER, & ALL ACCESSORIES REQUIRED BY VENDOR FOR PROPER OPERATION.
2. INTERLOCK WITH LIGHT SWITCH/OCCUPANCY SENSOR

NEW DIFFUSER, REGISTER, AND GRILLE SCHEDULE

TAG	MAKE & MODEL	SIZE	NECK SIZE	CFM RANGE	DESCRIPTION
(N)SAD-2	TITUS TMS	12X12	6"Ø	0-95	ALUMINUM CONSTRUCTION, SURFACE OR LAY-IN MOUNT, ROUND NECK. CEILING DIFFUSER WITH REMOVABLE CENTER CONE. PROVIDE OPPOSED BLADE DAMPER AND SECTORIZING BAFFLE FOR AIRFLOW OTHER THAN 4-WAY BLOW.

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

AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
(E)RTU-1	SEE PLAN	6000 CFM	745 CFM	5255 CFM	-
(N)EF-1	TOILET	-	-	-	75 CFM
	TOTAL:	6000 CFM	745 CFM	5255 CFM	75 CFM
BUILDING PRESSURE:		.....		670 CFM	**POSITIVE**

NEW VOLUME DAMPER CABLE CONTROLS

TYPE	DESCRIPTION
"VD1"	THE VOLUME DAMPER SHALL BE ADJUSTABLE FROM THE FACE OF THE DIFFUSER BY USE OF THE BOWDEN CABLE CONTROL SYSTEM (#270-275 CONTROLLER) MANUFACTURED BY YOUNG REGULATOR COMPANY OR APPROVED EQUIVALENT. DAMPER MUST BE INSTALLED WITHIN 30 FEET FROM THE FACE OF THE DIFFUSER. COORDINATE INSTALLATION WITH GENERAL CONTRACTOR. YOUNG REGULATOR (440) 232-9700.

NEW THERMOSTAT SCHEDULE

T	NEW THERMOSTAT TO BE HONEYWELL VISIONPRO 8000. MOUNT AT 4'-0" AFF. THERMOSTAT SHALL BE TOUCH SCREEN PROGRAMMABLE, 7-DAY TYPE.

2 SCHEDUES
NTS

MECHANICAL LEGEND

- CEILING SUPPLY AIR DIFFUSER (SAD)
- CEILING SUPPLY AIR DIFFUSER WITH BLANK-OFF SECTION
- CEILING RETURN AIR TERMINAL (RET)
- EXHAUST FAN
- WALL TRANSFER GRILLE (TG)
- THERMOSTAT (T)
- TEMPERATURE SENSOR (S)
- NEW DUCTWORK
- EXISTING DUCT TO REMAIN
- GRAVITY DAMPER (GD)
- NEW FLEX DUCT
- VD — VOLUME DAMPER
- VD1 — VOLUME DAMPER W/ REMOTE OPERATOR
- SAD / 100 — TYPE OF AIR DEVICE / AIR QUANTITY (CFM)
- Z x Y — X, INCHES, SIDE OF DUCT SHOWING
- M — MOTORIZED DAMPER
- S — DUCT MOUNTED SMOKE DETECTOR
- (E) — EXISTING
- (R) — RELOCATE
- (N) — NEW
- FIELD CONNECTION
- U — DOOR UNDER CUT
- SUPPLY AIR FLOW
- RETURN AIR FLOW

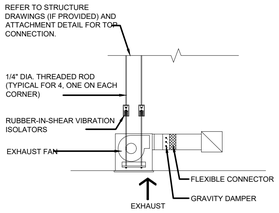
NOTE:
SYMBOL LIST SHOWN IS FOR GENERAL REFERENCE ONLY. THE PRESENCE OF A SYMBOL DOES NOT IMPLY ITS USE ON THIS PROJECT. REFER TO DRAWINGS FOR SPECIFIC SYMBOLS USED.

KEY NOTES

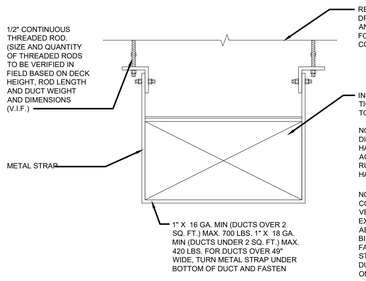
1	EXISTING MECHANICAL ROOFTOP UNIT TO REMAIN. CLEAN AND REFURBISH TO "LIKE-NEW" CONDITION. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING UNIT. VERIFY IN FIELD PRIOR TO BID ENSURE UNIT IS BALANCED TO 6000CFM PER EXISTING AS-BUILT CONDITIONS AND BALANCE OUTSIDE AIR DAMPER TO 745 CFM. NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO BID AND START OF WORK.
2	PROVIDE NEW EXHAUST FAN/LIGHT COMBO WITH GRAVITY DAMPER. CONNECT 6"Ø EXHAUST DUCT TO THE MALL CENTRAL TOILET EXHAUST SYSTEM, EXTEND/MODIFY BRANCH DUCTWORK IF REQUIRED. COORDINATE EXACT LOCATION, DISTANCE & CONNECTION POINT IN FIELD.
3	EXISTING DUCTWORK TO REMAIN. CONTRACTOR SHALL CLEAN AND REFURBISH TO 'LIKE' NEW CONDITION. VERIFY EXACT LOCATION AND SIZE IN FIELD. CONTRACTOR SHALL PATCH AND SEAL DUCTWORK AIRTIGHT. INSPECT, PATCH, REPAIR, AND/OR REPLACE INSULATION AS REQUIRED. COORDINATE IN FIELD PRIOR TO BID.
4	CONTRACTOR TO RELOCATE EXISTING RETURN AIR TERMINAL AS SHOWN.
5	CONTRACTOR SHALL CLEAN AND REFURBISH EXISTING DUCT SMOKE DETECTOR IN RETURN DUCTWORK TO "LIKE NEW" CONDITION. ENSURE SMOKE DETECTOR IS IN GOOD WORKING ORDER. PROVIDE NEW AS REQUIRED. WIRE BACK TO NEW SMOKE DETECTOR (SDT) LOCATED IN BACK OF HOUSE.
6	EXISTING TEMPERATURE SENSORS TO BE RE-USED & RELOCATED. CONTRACTOR TO VERIFY IN FIELD, REPLACE IN KIND IF DAMAGED. COORDINATE WITH EXISTING UNIT MANUFACTURER FOR COMPATIBLE CONTROLS AS REQUIRED..
7	PROVIDE NEW SUPPLY GRILLE TO MATCH EXISTING. CONTRACTOR SHALL ORDER SAME STYLE, FINISH, FRAME, ETC. AS REQUIRED. COORDINATE IN FIELD.
8	EXISTING SUPPLY DIFFUSER/GRILLE TO REMAIN. VERIFY SIZE, LOCATION AND COORDINATE WITH ARCHITECTURAL SHEETS INCLUDING REFLECTED CEILING PLAN. CLEAN AND REFURBISH TO "LIKE NEW" CONDITION. CONTRACTOR SHALL BALANCE CFM INDICATED OF ALL EXISTING SUPPLY DIFFUSERS/GRILLES TO BE MAXIMUM CAPACITY OF THE MECHANICAL UNIT TO ACHIEVE FULL PERFORMANCE AND FUNCTION OF THE EXISTING MECHANICAL SYSTEM. PROVIDE VOLUME DAMPER OR COLLAR DAMPER. VERIFY IN FIELD PRIOR TO BID.
9	EXISTING THERMOSTAT TO BE RE-USED AND RELOCATED. CONTRACTOR TO VERIFY IN FIELD, REPLACE IN KINDS IF DAMAGED.
10	CONTRACTOR TO PROVIDE 1" DOOR UNDERCUT FOR AIR TRANSFER.
11	EXISTING RETURN AIR TERMINAL TO BE RELOCATED AS SHOWN ON DRAWING.
12	EXISTING RA TERMINAL TO BE REMOVED/BLANK OFF. CONTRACTOR TO COORDINATE WITH ARCHITECT PRIOR TO BID.
13	CONTRACTOR TO DISCONNECT AND REMOVE EXISTING SUPPLY DIFFUSER ALONG WITH ASSOCIATED BRANCH DUCTWORK AS SHOWN. CONTRACTOR SHALL PATCH AND SEAL DUCTWORK AIRTIGHT.
14	PROVIDE NEW SUPPLY DIFFUSER AND CONNECT NEW DUCT TO EXISTING MAIN DUCTWORK AS SHOWN ON DRAWING.

NOTE #1:
CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ADEQUATE CONNECTION TO STRUCTURE / DECK ABOVE BASED ON CONDITIONS.

NOTE #2:
CONTRACTOR SHALL VERIFY MATERIAL OF EXISTING STRUCTURE/DECK ABOVE IN FIELD PRIOR TO BID, SHOP DRAWINGS, FABRICATION, OR WORK START. PROVIDE ADEQUATE SUPPORT(S) BASED ON EXISTING CONDITIONS.



CEILING EXHAUST FAN DETAIL | SCALE NTS | 1

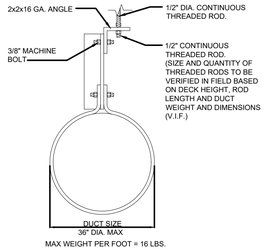


NOTE #1:
DISTANCE BETWEEN DUCT HANGERS SHALL BE IN ACCORDANCE WITH THE RULES OF THE AGENCIES HAVING JURISDICTION.

NOTE #2:
CONTRACTOR SHALL VERIFY MATERIAL OF EXISTING STRUCTURE/DECK ABOVE IN FIELD PRIOR TO BID, SHOP DRAWINGS, FABRICATION, OR WORK START. PROVIDE ADEQUATE DUCT SUPPORT(S) BASED ON EXISTING CONDITIONS.

DUCTWORK SUPPORT DETAIL
NOT TO SCALE

MAX. SIDE INCHES	RECTANGULAR DUCTS MIN. GALV. SHT. GAUGE	ALUMINUM MIN. B & S GAUGE
THROUGH 12	26 (0.022 IN.)	24 (0.020 IN.)
13 THROUGH 30	24 (0.028 IN.)	22 (0.025 IN.)
31 THROUGH 54	22 (0.034 IN.)	20 (0.032 IN.)
55 THROUGH 84	20 (0.040 IN.)	18 (0.040 IN.)
OVER 84	18 (0.052 IN.)	16 (0.051 IN.)

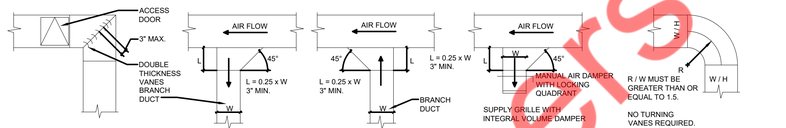


MAX WEIGHT PER FOOT = 16 LBS.

ROUND DUCT SUPPORT DETAIL
NOT TO SCALE

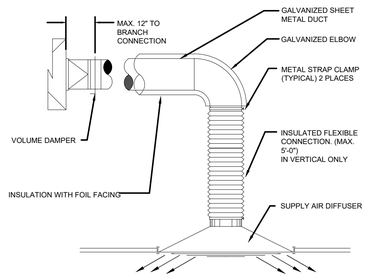
DIAMETER INCHES	SPIRAL SEAM DUCT STEEL MIN. GALV. SHT. GAUGE	ROUND DUCTS LONGITUDINAL SEAM DUCT STEEL MIN. GALV. SHT. GAUGE	FITTINGS STEEL MIN. GALV. SHT. GAUGE
THROUGH 12	28 (0.019 IN.)	26 (0.022 IN.)	26 (0.022 IN.)
13 THROUGH 18	26 (0.022 IN.)	24 (0.028 IN.)	24 (0.028 IN.)
19 THROUGH 28	24 (0.028 IN.)	22 (0.034 IN.)	22 (0.034 IN.)
29 THROUGH 36	22 (0.034 IN.)	20 (0.040 IN.)	20 (0.040 IN.)
37 THROUGH 52	20 (0.040 IN.)	18 (0.052 IN.)	18 (0.052 IN.)

DUCT SUPPORT DETAIL | SCALE NTS | 2



SQUARE ELBOW | SUPPLY TAP | RETURN TAP | SUPPLY TAP WITH SUPPLY GRILLE | ALTERNATE RECTANGULAR ELBOW

STANDARD DUCTWORK DETAILS | SCALE NTS | 3



STANDARD DIFFUSER DETAIL | SCALE NTS | 4

ELECTRICAL GENERAL NOTES

A. SCOPE OF WORK

1. FURNISH ALL LABOR AND MATERIAL TO COMPLETE ALL ELECTRICAL WORK SHOWN ON THE DRAWINGS

2. THE LISTING OF ARTICLE OR MATERIAL, OPERATION OR METHOD, REQUIRES THAT THE CONTRACTOR SHALL PROVIDE AND INSTALL, UNLESS NOTED TO BE SUPPLIED BY OTHERS, EACH ITEM LISTED OF QUALITY OR SUBJECT TO QUALIFICATION NOTED. EACH OPERATION SHALL BE PERFORMED ACCORDING TO STANDARD PRACTICE, MANUFACTURER'S INSTRUCTIONS AND CONDITIONS STATED, PROVIDING, THEREFORE, ALL NECESSARY LABOR, EQUIPMENT AND INCIDENTALS.

3. THE ELECTRICAL CONTRACTOR SHALL SCHEDULE HIS WORK TO CONFORM TO THE PROGRESS OF THE OTHER TRADES AND CONTRACTORS EMPLOYED ON THIS PROJECT. THE PRINCIPAL ITEMS OF WORK INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

A. PROVIDE ELECTRICAL SERVICE INCLUDING CONDUITS, CABLES, TERMINATIONS, METERING EQUIPMENT, ETC. IN ACCORDANCE WITH UTILITY REQUIREMENTS AND DRAWINGS

B. PROVIDE LIGHTING FIXTURE AS SHOWN ON DRAWINGS. THIS SHALL INCLUDE ALL ASSOCIATED LAMPS, BOXES, SWITCHES, CONTRACTORS, AND BRANCH CIRCUIT WIRING AND MATERIALS REQUIRED FOR A COMPLETE INSTALLATION.

C. PROVIDE DEVICES (RECEPTACLES, SWITCHES, ETC.) AS SHOWN ON DRAWINGS. THIS SHALL INCLUDE ALL ASSOCIATED BRANCH CIRCUIT WIRING AND MATERIAL REQUIRED FOR A COMPLETE INSTALLATION.

D. POWER FEEDERS TO HVAC EQUIPMENT INCLUDING RTU'S, EXHAUST FANS, INCLUDING DISCONNECT SWITCHES, CONTROL DEVICES, STARTERS FOR MOTORS NOT PROVIDED BY OTHERS. (CONSULT HVAC CONTRACTOR FOR PHASE AND VOLTAGE OF EQUIPMENT AND ACTUAL NAMEPLATE RATINGS FOR FEEDER MINIMUM CONDUCTOR AMPACITIES (MCA) AND MAXIMUM OVERCURRENT PROTECTION DEVICES (MOCPD) INFORMATION PRIOR TO INSTALLATION AND PRIOR TO PURCHASING ELECTRICAL EQUIPMENT.

E. PROVIDE POWER DISTRIBUTION EQUIPMENT (PANELBOARDS, DISCONNECT SWITCHES, CONTRACTORS, MOTOR STARTERS, ENCLOSED CIRCUIT BREAKERS, ETC.) AS SHOWN ON DRAWINGS OR AS REQUIRED FOR THIS PROJECT. THIS SHALL INCLUDE ALL WIRING AND ASSOCIATED MATERIAL REQUIRED FOR A COMPLETE INSTALLATION.

F. PROVIDE FIRE ALARM SYSTEM ONLY IF REQUIRED BY FIRE MARSHALL OR LOCAL CODES. (E.C. MUST VERIFY REQUIREMENTS PRIOR TO BIDDING)

G. PROVIDE TESTING OF ALL ELECTRICAL EQUIPMENT.

H. PROVIDE TIMERS, PHOTOCELLS, AND CONTRACTORS FOR CONTROL OF EXTERIOR LIGHTING AND HVAC EQUIPMENT.

I. PROVIDE BACKBOXES, PULLSTATIONS, AND CONDUIT TO ABOVE ACCESSIBLE CEILING FOR ALL VOICE AND COMMUNICATIONS OUTLETS.

J. PROVIDE CONDUIT, JUNCTION BOXES, 115 VOLT FEEDERS, BACKBOXES, ETC. AS REQUIRED FOR SECURITY SYSTEM CAMERAS, ELECTRICAL DOOR STRIKES, ALARMS, REQUEST TO EXIT, MOTION SENSORS, CARD READERS, KEYPADS AND MAIN SECURITY PANEL AS PER DRAWINGS OR AS DIRECTED BY OWNER OR ARCHITECT. VERIFY EXTENT OF WORK PRIOR TO SUBMITTING BIDS.

K. PROVIDE EMERGENCY LIGHTING, BATTERY UNITES, REMOTE HEADS, EXIT LIGHTS AND ALL ASSOCIATED WIRING, CONDUIT, JUNCTION BOXES, CONNECTIONS, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION.

B. INSTALLATION

1. THIS CONTRACTOR SHALL VISIT THE JOB SITE TO DETERMINE PRESENT CONDITIONS AND VERIFY EXACT LOCATION OF EQUIPMENT AND LOCAL REGULATIONS PRIOR TO SUBMITTING BID.

2. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AN PATCHING OF EXISTING WALLS CEILINGS AND FLOOR SLABS NECESSARY FOR THE COMPLETION OF HIS WORK.

3. UNLESS SPECIFICALLY NOTED OTHERWISE, ALL WORK AND MATERIAL SHOWN SHALL BE PERFORMED, FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.

4. THE COMPLETE INSTALLATION SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE NATIONAL, STATE AND CITY CODES, RULES, REGULATIONS AND ORDINANCE. ALSO MAKE APPLICATION FOR AN ND PAY ALL FEES IN CONNECTION WITH ANY PERMITS, TESTS AND INSPECTIONS THAT MAY BE REQUIRED.

5. GUARANTEE ALL WORKMANSHIP, MATERIAL AND PERFORMANCE FOR PERIOD OF ONE (1) YEAR FROM DATE OF FINAL ACCEPTANCE.

6. THE EXACT MOUNTING LOCATIONS OF APPARATUS, DEVICES, EQUIPMENT AND CONDUITS SHALL BE ASCERTAINED FROM OWNER OR THEIR REPRESENTATIVE IN THE FIELD, AND THE WORK SHALL BE LAID OUT ACCORDINGLY. SHOULD THE CONTRACTOR FAIL TO ASCERTAIN SUCH LOCATIONS, THE WORK SHALL BE CHANGED AT THIS OWN EXPENSE WHEN SO ORDERED BY OWNER, THE OWNER RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF CABLE, CONDUIT AND EQUIPMENT INSTALLED BY THIS CONTRACTOR UP TO THE TIME OF INSTALLATION, WITHOUT ADDITIONAL COST.

7. ALL CONDUCTORS SHALL BE COPPER, THHN INSULATION UNLESS OTHERWISE NOTED. ALL WIRING SHALL BE IN EMT OR MC CABLE RUN CONCEALED IN FINISHED AREAS AND NOT SUBJECT TO PHYSICAL DAMAGE. RUN EMT IN UNFINISHED CEILING AREAS.

8. RUN ALL CONDUIT CONCEALED IN BLOCK WALLS AND RECESS ALL DEVICES IN BIRCH WALLS TO THE EXTENT POSSIBLE AND/OR PRACTICAL.

C. DRAWINGS AND SPECIFICATIONS

1. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO SHOW THE APPROXIMATE LOCATIONS OF EQUIPMENT AND PIPING. DIMENSIONS GIVEN ON THE PLANS SHALL BE VERIFIED IN THE FIELD. DRAWINGS MAY NOT BE SCALED TO OBTAIN EXACT DIMENSIONS.

2. THE EXACT LOCATIONS OF APPARATUS, FIXTURES, EQUIPMENT AND CONDUITS SHALL BE ASCERTAINED FROM THE OWNER OR HIS REPRESENTATIVE IN THE FIELD, AND THE WORK SHALL BE LAID OUT ACCORDINGLY, SHOULD THE CONTRACTOR FAIL TO ASCERTAIN SUCH LOCATIONS, THE WORK SHALL BE CHANGED AT HIS OWN EXPENSE WHEN SO ORDERED BY THE OWNER.

3. THIS CONTRACTOR SHALL FURNISH SUCH LABOR AND MATERIALS AS HERE-IN-AFTER SPECIFIED AND AS REQUIRED TO COMPLETE ALL ELECTRICAL CONNECTIONS IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS FOR ALL MECHANICAL AND PLUMBING EQUIPMENT AND OWNER'S EQUIPMENT AS SHOWN AND/OR SPECIFIED.

L. VISITING TO THE SITE

1. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING HIS WORK, AND THE SUBMISSION OF HIS PROPOSAL SHALL BE CONSTRUED AS INDICATING SUCH KNOWLEDGE, NO ADDITIONAL PAYMENT WILL BE MADE ON CLAIMS THAT ARISE FROM LACK OF SUCH KNOWLEDGE OF EXISTING CONDITIONS.

E. MATERIALS AND WORKMANSHIP

1. ALL WORK SHALL BE INSTALLED IN PRACTICAL AND WORKMANLIKE MANNER BY COMPETENT WORKMEN, SKILLED IN THEIR BRANCH OF THE TRADE.

2. UNLESS SPECIFICALLY SPECIFIED OR INDICATED ONT HE DRAWINGS TO THE CONTRARY, ALL MATERIALS SHALL BE NEW AND FREE FROM DEFECTS, AND SHALL BE THE BEST OF THEIR SEVERAL KINDS.

3. ALL MATERIALS SHALL MEET OR EXCEED STANDARDS SPECIFIED BY UL, NEMA, ANSI AND IEEE WHEREVER SUCH STANDARDS HAVE BEEN ESTABLISHED.

4. THE CONTRACTOR SHALL REMOVE ALL DEBRIS AND EXCESS MATERIALS ASSOCIATED WITH HIS WORK AND LEAVE THE WORK AREA CLEAN AT THE END OF EACH WORK DAY.

5. ALL ELECTRICAL EQUIPMENT AND MATERIAL SHALL BEAR THE UNDERWRITER'S LABORATORIES LABEL.

F. DEFINITIONS

1. "INSTALL" SHALL MEAN TO PLACE, FIX IN POSITION, SECURE, ANCHOR, ETC. INCLUDING NECESSARY APPURTENANCES AND LABOR SO THAT THE EQUIPMENT OR INSTALLATION WILL FUNCTION AS SPECIFIED AND INTENDED.

2. "FURNISH" SHALL MEAN TO PURCHASE AND SUPPLY EQUIPMENT OR COMPONENTS.

3. "PROVIDE" SHALL MEAN TO "FURNISH AND INSTALL".

4. "OR APPROVED EQUIVALENT" AND "OR EQUIVALENT" SHALL MEAN EQUIVALENT IN TYPE, DESIGN, QUALITY, ETC. AS DETERMINED BY THE OWNER AND APPROVED BY THE ENGINEER.

G. CODES, PERMITS, AND INSPECTIONS

1. INSTALL ALL WORK IN FULL ACCORDANCE WITH CODES, RULES, AND REGULATIONS OF MUNICIPAL, CITY, COUNTY, STATE AND PUBLIC UTILITY AND ALL OTHER AUTHORITIES HAVING JURISDICTION OVER THE PREMISES. THIS SHALL INCLUDE ALL DEPARTMENT OF INDUSTRIAL RELATIONS, OSHA AND THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODES, AS INTERPRETED BY THE LOCAL INSPECTION DIVISION. ALL THESE CODES, RULES AND REGULATIONS ARE HEREBY INCORPORATED INTO THIS SPECIFICATION.

2. COMPLY WITH SPECIFICATION REQUIREMENTS WHICH ARE IN EXCESS OF CODE REQUIREMENTS AND NOT IN CONFLICT WITH SAME.

3. THE CONTRACTOR SHALL SECURE ALL PERMITS AND CERTIFICATED OR INSPECTION INCIDENTAL TO HIS WORK, REQUIRED BY THE FOREGOING AUTHORITIES. ALL SUCH CERTIFICATES SHALL BE DELIVERED TO THE OWNER IN DUPLICATE, BEFORE FINAL PAYMENT ON CONTRACT WILL BE ALLOWED. THE CONTRACTOR SHALL PAY ALL FEES, CHARGES AND OTHER EXPENSES IN CONNECTION THEREWITH.

H. LABELING AND NAMEPLATES

1. PERMANENTLY LABEL PANELBOARDS, TIME SWITCHES, CONTRACTORS AND SAFETY SWITCHES INDICATING EQUIPMENT OR PANELS AND AREAS WHICH THEY SERVE. LABEL ALL PULL AND JUNCTION BOXES SERVING MECHANICAL EQUIPMENT.

2. LIGHTING AND APPLIANCE PANELS SHALL BE LABELED AS SHOWN ON DRAWINGS.

3. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL IDENTIFICATION FOR PULL OR JUNCTION BOXES FURNISHED BY HIM.

4. IDENTIFY AS TO USE ON FACE OF EQUIPMENT BY MEANS OF LAMINATED BLACK AND WHITE PHENOLIC LABEL WITH 1/2" LETTERS ENGRAVED THROUGH BLACK TO WHITE.

I. TESTS AND VOLTAGE RECORD

1. ELECTRICAL CONTRACTOR SHALL TEST ALL WIRING AND CONNECTIONS FOR CONTINUITY AND GROUNDS. WHEN THE INSULATION RESISTANCE TEST SHALL INDICATE THE POSSIBILITY OF FAULTY INSULATION, THE CONTRACTOR SHALL LOCATED THE POINTS OF SUCH FAULT INSULATION AND HE SHALL PULL OUT THE CONDUCTOR AT FAULT, REPLACE SAME WITH NEW, AND DEMONSTRATE, BY FURTHER TEST THE ELIMINATION OF SUCH FAULT.

2. RECORD FEEDER LOAD CURRENTS AND LINE VOLTAGES MEASURED AT EACH PANELBOARD. ADJUST SINGLE PHASE LOAD CONNECTIONS TO BALANCE FEEDER LOADS WITH 10%. PROVIDE THE OWNER WITH A COMPLETE COPY OF ALL LOAD AND VOLTAGE RECORDS.

J. BRANCH CIRCUIT WIRING

1. PROVIDE A SYSTEM OF PANELS, CONDUITS, FITTING, BOXES, SUPPORTS AND ALL OTHER MISCELLANEOUS MATERIALS REQUIRED FOR EQUIPMENT INDICATED ON PLANS, COMPLETE AND READY FOR OPERATION BY THE OWNER.

2. HOME RUNS FROM 20A OUTLETS 125 FT. OR OVER AT 277 VOLTS, OR 60 FT. OR OVER AT 120 VOLTS SHALL BE #10.0 WIRE.

3. ALL FIXTURE AND BRANCH CIRCUIT WIRING CONNECTIONS OR SPLICES SHALL BE MADE IN JUNCTION AND OUTLET BOXES WITH U.L. LISTED PRESSURE TYPE. CONNECTORS AND LISTED FOR 600 VOLTS (1,000 VOLTS WHEN ENCLOSED IN FIXTURE). IDEAL INDUSTRIES WING NUTS AND/OR WIRE NUTS OR APPROVED EQUIVALENT MAY BE USED FOR JOINTS IN WIRE OF #8 GAUGE OR LESS.

K. CONDUCTORS

1. SIZES OF CONDUCTORS FOR FEEDERS ARE GIVEN ON THE DRAWINGS, AND NO WIRE SMALLER THAN #12 GAUGE SHALL BE USED FOR BRANCH LIGHTING OR POWER CIRCUITS. ALL WIRING SHALL HAVE THE U.L. LABEL, AND BE OF 98% CONDUCTIVITY COPPER, ALUMINUM WIRE OR ALUMINUM CABLE IS NOT ACCEPTABLE UNLESS SPECIFICALLY SHOWN ON DRAWINGS.

2. THE GAUGE OF ALL WIRE SHALL BE IN ACCORDANCE WITH B & S STANDARD.

3. ALL WIRE AND CABLE FOR BRANCH LIGHTING OR SMALL POWER CIRCUITS SHALL HAVE "NEC: TYPE "THHN" 600 VOLT INSULATION,

4. WIRE AND CABLE ABOVE #8 GAUGE SHALL BE STRANDED TYPE "THHN" INSULATED 600 VOLTS.

L. CONDUIT AND CABLES

1. ALL CONDUIT SHALL BE RIGID, THREADED, METAL CONDUIT OR ELECTRICAL METALLIC TUBING (EMT) UNLESS OTHERWISE SPECIFICALLY STATED HEREIN.

2. CONDUIT AND EMT SHALL BE DELIVERED TO THE BUILDING IN 10 FOOT LENGTHS AND EACH LENGTH SHALL HAVE THE APPROVED UNDERWRITER'S LABORATORIES LABEL.

3. CONDUIT SHALL BE RUN CONCEALED IN ALL FINISHED AREAS OF THE BUILDING AND MAY BE RUN EXPOSED IN UNFINISHED AREAS AT CEILING OF JOIST LEVEL. RUN CONCEALED IN BLOCK WALLS THE EXTENT THAT IS PRACTICAL.

4. EMT CONNECTORS AND COUPLERS SHALL BE RAIN TIGHT COMPRESSION TYPE (OR SET-SCREW WHERE ACCEPTABLE TO OWNER AND LOCAL CODES) MADE OF STEEL AS MANUFACTURED BY THOMAS & BETTS, STEEL CITY OF APPLETON. BENDS AND OFFSETS SHALL BE MADE WITH A HICKEY OR POWER BENDER WITHOUT KINKING OR DESTROYING THE SMOOTH BORE OF THE CONDUIT. PARALLELED CONDUITS SHALL RUN STRAIGHT AND TRUE WITH OFFSETS UNIFORM AND SYMMETRICAL, CONDUIT TERMINALS AT BOXES AND CABINETS SHALL BE RIGIDLY SECURED WITH LOCKNUTS AND BUSHINGS AS REQUIRED BY THE NATION ELECTRICAL CODE. INSULATED BUSHINGS SHALL BE USED ON ALL CONDUIT 1-1/4" TRADE SIZE AND LARGER.

5. CONDUIT SHALL BE SECURELY FASTENED IN PLACE AT NO MORE THAN 10 FT. CENTERS, AND HANGER, SUPPORTS, OR FASTENINGS SHALL BE PROVIDED AT EACH CONDUIT ELBOW AND AT THE END OF EACH STRAIGHT RUN TERMINATING AT A BOX OR CABINET. CONDUIT SHALL NOT BE SUSPENDED FROM THE CEILING OR CEILING SUSPENSION WIRES.

6. HORIZONTAL AND VERTICAL CONDUIT RUNS SHALL BE SUPPORTED BY ONE-HOLE MALLEABLE STRAPS, OR THEIR APPROVED METAL DEVICE WITH SUITABLE BOLTS, OR BEAM CLAMPS FOR MOUNTING TO BUILDING STRUCTURE OR SPECIAL BRACKETS, CONDUIT SHALL BE SUPPORTED FROM STRUCTURAL STEEL OR JOIST AND INDEPENDENT OF OTHER PIPING. DO NOT SUPPORT CONDUIT FROM METAL ROOF DECK, OR ANY OTHER SUPPORT DEVICE OF ANOTHER TRADE.

7. NON-METALLIC SHEATHED CABLE (ROMEX) OR AC CABLE SHALL NOT BE USED. TYPE MC CABLE MAY BE USED ONLY WHEN CONCEALED IN FINISHED WALLS OR ABOVE CEILING AND WHEN NOT SUBJECT TO PHYSICAL DAMAGE UNLESS ITS USE IS NOT APPROVED ABBEY OWNER OR LOCAL CODES.

8. ONLY SHORT RUNS OF FLEXIBLE METAL CONDUIT NOT OVER 30" IN LENGTH SHALL BE USED FOR TERMINAL CONNECTIONS TO MOTORS AND OTHER VIBRATING EQUIPMENT, AND ALSO FOR ELECTRICAL EQUIPMENT WHERE IT IS NOT PRACTICAL TO MAKE FINAL CONNECTION WITH RIGID CONDUIT. FLEXIBLE CONDUIT EXPOSED TO WEATHER SHALL BE "SEALTITE" OR EQUIVALENT.

9. CONDUIT SYSTEM SHALL CONFORM TO ALL THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND LOCAL CODES.

M. GROUNDING

1. THIS CONTRACTOR SHALL PROVIDE, INSTALL AND CONNECT A COMPLETE SYSTEM OF GROUNDING FOR ALL EQUIPMENT AND STRUCTURES A GOOD MECHANICAL AND ELECTRICAL CONNECTION SHALL BE MADE WITH APPROVED GROUNDING CONNECTORS.

2. ELECTRICAL SYSTEM AND EQUIPMENT GROUNDS SHALL COMPLY WITH ALL LOCAL, STATE AND NEC CODES AND REGULATIONS.

3. PANELS, CONDUIT SYSTEMS MOTOR FRAMES, LIGHTING FIXTURES AND OTHER EQUIPMENT THAT ARE PART OF OF THIS INSTALLATION SHALL BE SECURELY GROUNDED BOTH MECHANICALLY AND ELECTRICALLY IN ACCORDANCE WITH ALL CODES.

4. MAIN GROUNDING SYSTEM (WHEN APPLICABLE) SHALL BE SIZED TO CONFORM WITH TABLE 250-66 OF NATIONAL ELECTRIC CODE. PROVED CONDUIT TO PROTECT GROUND WIRE FROM DAMAGE TO ANY AREA 6 FEET ABOVE FLOOR

N. LIGHTING/APPLIANCE PANELBOARDS AND DISTRIBUTION PANELS

1. DISTRIBUTION PANELS SHALL BE SQUARE "D" CO., TYPE "ILINE" OR APPROVED EQUIVALENT G.E., SIEMENS, OR CUTLER HAMMER.

2. 480/277V PANELS SHALL BE SQUARE "D" CO. TYPE "NF" OR APPROVED EQUIVALENT BY G.E., SIEMENS, OR CUTLER HAMMER. BREAKERS SHALL BE BOLTED TO BUS TYPE, QUICK-MAKE, BREAK-BREAKERS, AND CAPABLE OF INTERCHANGING ONE, TWO OR THREE POLE UNITS. MULTIPLE UNITS SHALL BE COMMON TRIP. PROVIDE SPARE BREAKERS IN EACH PANEL AS SHOWN. ALL BUSSING SHALL BE 98% CONDUCTIVITY COPPER, ALUMINUM BUS, ALUMINUM CONDUCTORS OR ALUMINUM LUGS ARE NOT ACCEPTABLE.

3. 208/120V PANELS SHALL BE SQUARE "D" CO. TYPE "NQOD" OR APPROVED EQUIVALENT BY G.E., SIEMENS, OR CUTLER HAMMER WITH TYPE "QOB" BOLT-ON BRANCH BREAKERS ONLY.

4. SHORT CIRCUIT RATINGS OF NEW PANELS SHALL BE AS NOTED ON DRAWINGS, OR AS OTHERWISE DIRECTED BY LOCAL UTILITY COMPANY. UL TESTED AND CERTIFIED SERIES RATINGS ARE ACCEPTABLE WITH WRITTEN DOCUMENTATION SHOWING SERIES RATINGS BUT ONLY IF ACCEPTABLE TO OWNER OR LOCAL CODES.

O. GENERAL FOR ALL PANELS

1. METAL FRAMED CARDHOLDERS WITH TYPEWRITTEN CIRCUIT DIRECTORY MUST BE PROVIDED FOR EACH PANEL. DIRECTORY SHALL BE CLEAR AND DESIGNATION SHALL MATCH IDENTIFICATION ON EQUIPMENT. PANELBOARDS (POWER PANELS AND LIGHTING PANELS) SHALL BE WITH IDENTIFICATION LABELED ON SWITCH AND/OR PANEL DOOR. PROVIDE ENGRAVED LAMINATED PHENOLIC NAMEPLATE WITH 1/2" LETTERS.

2. ALL PANELS SAFETY SWITCHES, STARTERS AND IN GENERAL, ALL EQUIPMENT REQUIRING LUGS SHALL BE EQUIPPED WITH SOLDERLESS TYPE U.L. APPROVED LUGS.

3. PROVIDE ALL NECESSARY UNISTRUT, CHANNEL, BACKING AND SUPPORTS TO MOUNT PANELBOARDS SECURELY IN PLACE.

4. SCREW FASTENED HANDLE LOCK-ON DEVICES ARE REQUIRED ON CIRCUIT BREAKERS PROTECTING SERVICES TO THE FOLLOWING EQUIPMENT:

A. EMERGENCY, EXIT, SECURITY AND NIGHT LIGHTS.

B. HEATING AND COOLING CONTROL CIRCUITS.

C. ALL TIME SWITCHES.

P. TOGGLE SWITCHES AND RECEPTACLES

1. SINGLE POLE 1221 AND THREE(3) WAY #1223- SWITCHES SHALL BE RATED 20 AMPERE, 277/120 VOLTS, COLOR TO BE BID AS WHITE (FINAL SELECTION BY ARCHITECT) HUBBELL OR EQUIVALENT. SWITCHES SHALL BE MOUNTED 4'-0" ABOVE FINISHED FLOOR TO CENTERLINE.

2. DUPLEX RECEPTACLES SHALL BE AS SPECIFIED ON DRAWINGS.

Q. DISCONNECT SWITCHES

1. AN APPROVED HORSEPOWER RATED, HEAVY DUTY, DISCONNECT SWITCH SHALL BE PROVIDED WITHIN SIGHT OF EACH MOTOR AND EACH HEATING UNIT. PROVIDE FUSED SWITCHES WHERE BRANCH CIRCUIT FUSES ARE NOT SIZED FOR OVERLOAD PROTECTION.

2. SWITCHES ON THE ROOF SHALL BE WEATHERPROOF MOUNTED ON UNISTRUT.

3. SWITCHES SHALL BE LABELED ON THEIR COVER IDENTIFYING THE EQUIPMENT TO BE PROTECTED.

R. MOTORS AND WIRING

1. FURNISH AND INSTALL DISCONNECT SWITCHES (EXCEPT WHERE SPECIFICALLY SPECIFIED BY OTHERS) AND RUN POWER CIRCUITS FROM THE POWER PANEL THROUGH DISCONNECT SWITCHES & CONTROL DEVICES TO MOTOR TERMINALS.

2. PROVIDE ALL STARTERS, CONTROLS AND PUSH BUTTON STATIONS ETC. NOT SUPPLIED BY MECHANICAL OR OTHER CONTRACTORS REQUIRED FOR THE PROPER AND INTENDED OPERATION OF MOTORS AND OR MOTORIZED EQUIPMENT SUPPLIED BY OTHERS.

A. THE ABOVE ELECTRICAL EQUIPMENT SHALL BE MOUNTED SECURELY TO WALL OR FRAMES AND THE ELECTRICAL CONTRACTOR SHALL FURNISH ALL NECESSARY BRACKETS, STRUCTURAL PIECES, EXPANSION BOLTS AND OTHER ACCESSORIES REQUIRED.

B. WOODEN PLUGS SHALL NOT BE PERMITTED FOR ANCHORING.

C. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER LUBRICATION OF ALL MOTORS.

3. REFER ALSO TO MECHANICAL SPECIFICATIONS FOR WORK BY MECHANICAL CONTRACTOR WHICH MAY RESULT IN ADDITIONAL WORK FOR THIS ELECTRICAL CONTRACTOR.

4. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING AN CONNECTIONS TO ALL HVAC EQUIPMENT.

5. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING AND CONNECTIONS TO ALL HVAC EQUIPMENT NOT PROVIDED BY OTHERS.

6. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL CONTROL EQUIPMENT (STARTERS, CONTRACTORS ETC.) NOT SUPPLIED BY HVAC CONTRACTOR BUT REQUIRED FOR THE INTENDED OPERATION OF HVAC EQUIPMENT

7. THE ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES FOR ALL HVAC EQUIPMENT NOT SUPPLIED BY OTHERS.

8. REFER TO MECHANICAL SPECIFICATION AND DRAWINGS FOR ADDITIONAL ELECTRICAL WORK AND COORDINATION.

S. FUSES

1. REPLACE ALL FUSES BLOWN DURING CONSTRUCTION AND TESTING AN PROVIDE A COMPLETE ST OF FUSES IN ALL FUSE HOLDERS, SWITCHES, PANELS AND ALL OTHER DEVICES REQUIRING FUSES.

2. FUSES SHALL BE CURRENT LIMITING, DUAL ELEMENT TIME DELAY TYPE PROVIDE OWNER WITH ONE SET OF SPARE FUSES FOR EACH FUSED SWITCH.

T. GUARANTEE

1. IN ADDITION TO WARRANTIES OF EQUIPMENT BY MANUFACTURER OF SAME, THIS CONTRACTOR SHALL ALSO GUARANTEE EQUIPMENT PROVIDED BY HIM AND SHALL BEHELD FOR A PERIOD OF ONE (1) YEAR TO MAKE GOOD ANY DEFECTS IN MATERIALS AND WORKMANSHIP OCCURRING DURING THIS PERIOD, AT HIS SOLE EXPENSE. THE ONE (1) YEAR PERIOD SHALL START FROM DATE OF FINAL ACCEPTANCE BY OWNER.

U. FIELD DRAWING

1. KEEP ONE (1) SET OF WORKING DRAWINGS AND SHIP DRAWINGS AT THE JOB SITE FOR SOLE PURPOSE OF RECORDING ALL CHANGES MADE DURING CONSTRUCTION. AFTER COMPLETION OF THE WORK AND BEFORE REQUESTING FINAL PAYMENT, THE ABOVE MENTIONED DRAWINGS SHALL BE DELIVERED TO THE OWNER.

V. SUBSTITUTION

1. WHENEVER ALTERNATE MATERIALS ARE SPECIFIED, IT IS WITH THE UNDERSTANDING THAT ANY ONE OF THE MATERIALS IS ACCEPTABLE TO THE OWNER. MATERIALS AND EQUIPMENT OTHER THAN THOSE SPECIFIED ARE NOT TO BE ASSUMED TO BE SATISFACTORY SUBSTITUTES WITHOUT PRIOR APPROVAL OF THE OWNER.

W. SHOP DRAWINGS

1. ONLY MANDATORY SHOP DRAWINGS AS LIMITED.OUTLINE HEREIN SHALL BE SUBMITTED.

2. NO WORK SHALL BE INSTALLED UNTIL THE MANDATORY SHOP DRAWINGS HAVE BEEN APPROVED BY THE ARCHTITECT/ENGINEER,. THE ARCHITECT/ENGINEER SHALL REVIEW SUBJECT SHOP DRAWINGS BEFORE A COPY IS SUBMITTED TO THE OWNER FOR RECORD PURPOSES.

3. ONLY MATERIAL AND EQUIPMENT MANUFACTURERS OF PRODUCTS OR SYSTEMS LISTED BELOW SHALL FURNISH MANDATORY SHOP DRAWINGS FOR APPROVAL BY THE ARCHITECT/ENGINEER PRIOR T CONTRACTORS PURCHASING EQUIPMENT, SHIP DRAWINGS ARE TO CONTAIN THE FOLLOWING:

   MANUFACTURER'S NAME, MATERIAL DESCRIPTION, SIZES AND DIMENSIONS AND OTHER PERTINENT INFORMATION TO CONFIRM AS MINIMUM STANDARD FOR EQUIPMENT LISTED IN THE SCHEDULES ON THE DRAWINGS AND OR IN THE SPECIFICATIONS.

4. SUBMIT A COPY OF SEVEN (7) COPIES OF ALL REQUIRED ELECTRICAL SHOP DRAWINGS.

5. THE FOLLOWING SHOP DRAWING SUBMITTALS ARE A MANDATORY REQUIREMENT OF THE OWNER, IF THE FOLLOWING EQUIPMENT IS TO BE INSTALLED:

* STEP DOWN TRANSFORMERS (480-120/208V) WHEN APPLICABLE
* WIRING DEVICES (INCLUDING WEATHERPROOF RECEPTACLES)
* LIGHTING FIXTURES & EMERGENCY LIGHTING FIXTURES
* DISCONNECT SWITCHES
* POWER/LIGHTING PANELS
* MOTOR STARTERS
* FIRE ALARM DEVICES

X. ALARM AND DETECTION SYSTEMS (BY VENDOR)

1. PROVIDE NECESSARY CONDUIT AND POWER FOR ALARM AND DETECTION SYSTEMS. THIS SHALL INCLUDE THE FOLLOWING:

- DEDICATED 20 AMP / 120 VOLT CIRCUIT (S).
- 3/4" CONDUIT (EMPTY) TO EACH TO DOOR CONTACT, SOUND DETECTION SILENT DURESS ALARM, FILM CAMERA, SUSPICION BUTTON, ETC. (REFER TO ARCHITECTURAL DOOR SCHEDULE)
- COORDINATE ALL LOCATIONS OF ALARM AND DETECTION SYSTEM WITH OWNER. THESE ITEMS ARE NOT SHOWN ON ELECTRICAL DRAWINGS.

Y. COMMUNICATION SYSTEMS

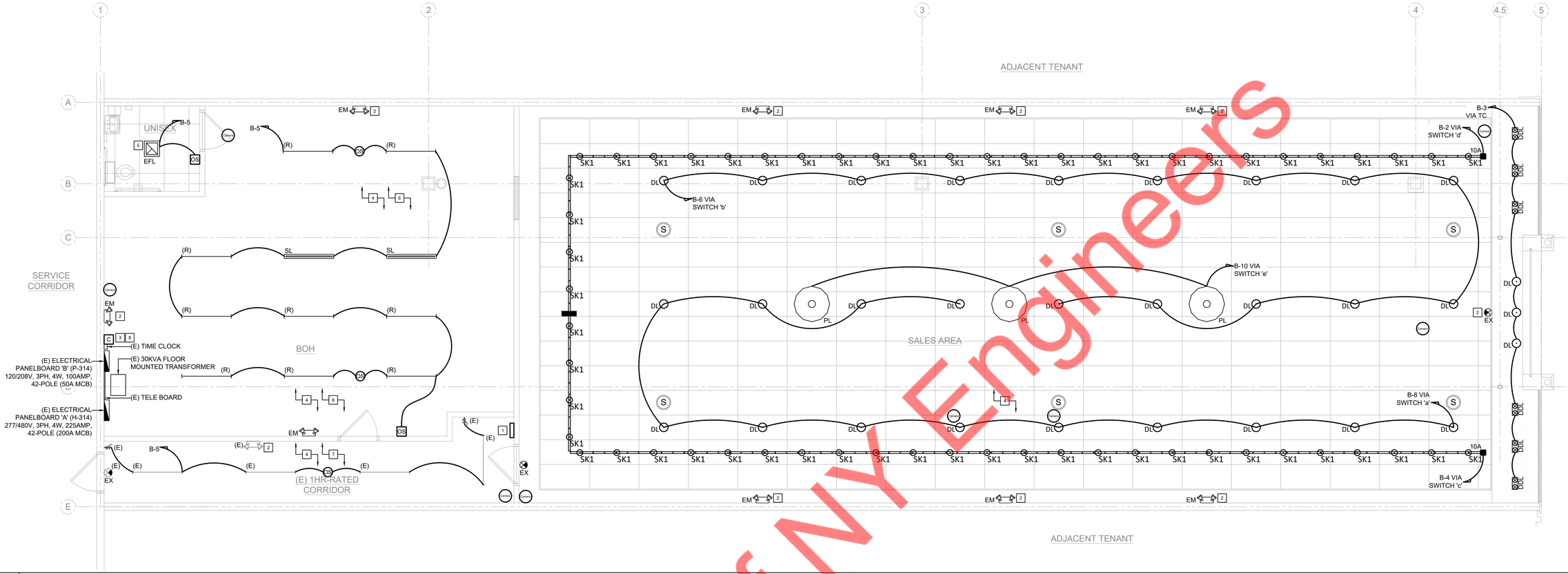
1. WORK INCLUDES: EMPTY CONDUIT WITH NYLON PULLWIRES AND BOXES FOR UTILITY TELEPHONE WIRING.

2. WORK BY COMMUNICATIONS CONTRACTOR:

- ALL WIRING FOR TELEPHONE INSTRUMENTS
- ALL TELEPHONE INSTRUMENTS

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



1 ELECTRICAL LIGHTING PLAN
1/4" = 1'-0"

LIGHT FIXTURE SCHEDULE

TYPE	SYMBOL	MANUFACTURER	MODEL	DESCRIPTION	COLOR	LAMP	LAMP WATT.	FIXTURE WATT.	VOLTAGE	MOUNTING
SK1	⊙	NORDEON	SKE1-28W-UNV-835-**-DIM	LED TRACKHEAD -3500K	WHITE	LED	24.4w	28w	120v	TRACK
-	▭	--	--	NEW LIGHT TRACK	WHITE		-	-	-	CLNG. MNTD. @ 11'-0" A.F.F.
DDL	⊠⊠	SOLAIS LIGHTING	XSR12-Xm24/25C-25C/35K/2000/WH/WH/010/HL/HL	2 HEAD LED MULTIPLA DOWNLIGHT-3500 K W/ LOUVER (SEMI-RECESSED DOUBLE DOWNLIGHT)	WHITE	LED	22		120v	SEMI-RECESSED
H	⊕	HUBBELL INDUSTRIAL	SAV-LH-35-8-SB16-CDL-U-RD-TBD	SAVANNO DECORATIVE LED, HIGHBAY 16" LED W/ SUSPENDED BEAD REFRACTOR AND CONICAL DROP LENS- NEW SUSPENDED HIGH BAY PENDANTS	WHITE	LED	72.7	-	-	SUSPENDED @ 11'-10" AFF
PL	○	LUMENWERX	PORDD-36-ULO-LED-80-8000-35-UNV	POP CORE 36 ROUND PENDANT DIRECT (RING PENDANT LIGHT) COLOR: BLACK	WHITE	LED	77.97W		120	SUSPENDED @ 9'-0" AFF WITH MOUNTING KIT
DL	⊙	CREE LIGHTING	CR6T-1600L-35K-12	LED 1600LM DOWNLIGHT- 3500 K	-	LED	20.5	-	-	RECESSED
EM	⊶ ⊶	EXITRONIX	MLED2-W-WP	REMOTE LAMPS FOR LED EXIT		LED				WALL MOUNTED @ 11'-0" A.F.F.
EX	⊗ ⊸	EXITRONIX	VEX-U-BP-WB-WH-R6-G2	VEX REMOTE SERIES , REMOTE CABLE THERMOPLASTIC LED		LED				
SL	▬	METALUX	8SLSTP8040DD-UNV	LENSED 8'-0" LONG STRIP	WHITE	LED	76W		120	SUSPENDED @ 12'-0"
SL	▬	METALUX	4SLSTP4040DD-UNV	LENSED 4'-0" LONG STRIP	WHITE	LED	40W		120	SUSPENDED @ 12'-0"
EFL	▨	BROAN / NUTONE	AE110LK	NEW RESTROOM LIGHTING	-	-	11W	-	-	CEILING MOUNTED
(E)	———	EXISTING / RELOCATED	EXISTING	EXISTING	EXISTING	EXISTING			120v	EXISTING

NOTE: ANY LIGHTING SUBSTITUTIONS TO BE APPROVED BY CROCS.
(E) EXISTING (R) RELOCATED (NL) FIXTURE CONNECTED TO NIGHT LIGHT CIRCUIT. (EM) FIXTURE WITH EMERGENCY BATTERY BACK-UP.

TLEDS TO BE USED FOR EXISTING STRIP LIGHTS (15W 3500K)

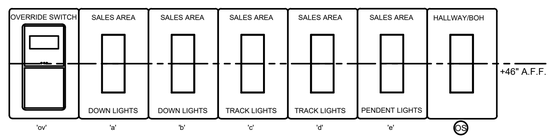
GENERAL NOTES

1. ALL ELECTRICAL WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE OR LOCAL CODE AND/OR OTHER AUTHORITIES HAVING JURISDICTION.
2. THE CONTRACTOR SHALL VISIT THE PROJECT SITE, REVIEW EXISTING CONDITIONS AGAINST THE PLANS, AND FAMILIARIZE HIMSELF WITH THE WORK PRIOR TO BIDDING AND START OF WORK.
3. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION AND QUANTITY OF LIGHTING FIXTURES.
4. EMERGENCY AND EXIT LIGHTS SHALL BE INSTALLED AND CIRCUITED PER LATEST NATIONAL ELECTRICAL CODE AND ALL LOCAL CODES. ALL EMERGENCY AND EXIT FIXTURES SHALL HAVE A MINIMUM 90-MINUTE BATTERY BACK-UP.
5. ELECTRICAL CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS AS REQUIRED FOR A FULLY COMPLETE AND OPERABLE SYSTEM.
6. ALL EQUIPMENT SHALL HAVE UL OR CSA LABELS.
7. G.C. IS RESPONSIBLE FOR ALL FINAL CONNECTION S, TERMINATIONS, AND COORDINATION IN ALL MILLWORK FIXTURES.
8. ELECTRICAL CONTRACTOR'S BID SHALL INCLUDE INSTALLATION OF ALL LIGHT FIXTURES AND ASSOCIATED LAMPS. SOME FIXTURES REQUIRE ASSEMBLY. E.C. IS RESPONSIBLE TO ENSURE THE ADJUSTABILITY OF ALL DIRECTIONAL FIXTURES AFTER INSTALLATION AND SHALL AIM FIXTURES PER DIRECTION FROM OWNER. IF THE CEILING SYSTEMS ARE FIRE RATED, E.C. SHALL CLOSELY COORDINATE RECESSED FIXTURE REQUIREMENT WITH OWNER AND SUPPLIER TO MAINTAIN THE FIRE RATING OF THE CEILING.
9. G.C. SHALL PROVIDE TIME CLOCK PROGRAMMING TRAINING SESSION FOR THE STORE MANAGER AND AT LEAST ONE OTHER EMPLOYEE PRIOR TO PROJECT CLOSEOUT.
10. ALL FIXTURES INSTALLED OUTDOORS SHALL BE RATED FOR DAMP/WET LOCATIONS AS REQUIRED. THE CONTRACTOR SHALL COORDINATE DAMP/WET LOCATION RATING PER NEC ARTICLE 410.10 (A). ALL INSTALLATIONS SHALL CONFORM TO NEC ARTICLE 410, ALL SUB ARTICLES. ALL FLUORESCENT FIXTURES THAT UTILIZE DOUBLE ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL BE CODE COMPLIANT WITH N.E.C. 410.130(G)
11. THE ELECTRICAL LIGHTING INSTALLATIONS SHALL CONFORM TO ALL STATE AND LOCAL SEISMIC AND CODE REQUIREMENTS REGARDING LIGHT FIXTURE SUPPORT. ALL ELECTRICAL METALLIC TUBING (EMT), RIGID NON-METALLIC CONDUITS, "SEAL TIGHT" TYPE CONDUITS AND ALL OTHER CONDUITS THAT DO NOT CONTAIN A CODE SIZED GROUND WIRE SHALL HAVE A CODE SIZED BOND WIRE INSTALLED WITH THE CIRCUIT CONDUCTORS.

KEY NOTES

1. NEW MASTER SWITCH BANK LOCATION. SEE DETAIL IN THIS SHEET FOR ADDITIONAL INFORMATION. VERIFY/CONFIRM LOCATION WITH OWNER PRIOR TO INSTALLATION AND ROUGH-IN.
2. ALL NEW/EXISTING/RELOCATED EXIT SIGNS & EMERGENCY LIGHTS TO BE CONNECTED TO LOCAL LIGHTING CIRCUIT AHEAD OF SWITCHING.
3. E.C. TO VERIFY EXACT LOCATION OF EXISTING TIME CLOCK IN THE FIELD TO CONTROL THE LIGHTING LOAD AND THE OPERABLE CONDITION OF EXISTING TIME CLOCK PRIOR TO BID. REUSE IF POSSIBLE. PROVIDE NEW IF REQUIRED. PROVIDE ADDITIONAL NEW TIME CLOCK (TC2) DIGITAL ELECTRONIC TIME SWITCH EQUAL TO INTERMATIC AS REQUIRED.
4. NEW SPEAKERS AND CAMERAS. COORDINATE LOW VOLTAGE REQUIREMENTS WITH LOW VOLTAGE PLAN ON SHEET E3.1.
5. NEW RESTROOM FAN LIGHT COMBO. TIE TO EXISTING CIRCUIT SERVING THE AREA. COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT REQUIREMENT.
6. EXISTING RELOCATED LIGHTS. CONTRACTOR TO TIE LIGHTS TO NEW CIRCUIT SERVING BOH LIGHT FIXTURES. CONTRACTOR SHALL RE-LAMP WITH LED BULBS. REPLACE WITH NEW LED LIGHT FIXTURE IF RETRO-FIT NOT POSSIBLE.
7. EXISTING LIGHTS TO REMAIN. CONTRACTOR TO REUSE LIGHTS AND CONTROLS ALONG WITH EXISTING CIRCUIT SERVING FIXTURES. CONTRACTOR SHALL RE-LAMP WITH LED BULBS. REPLACE WITH NEW LED LIGHT FIXTURE IF RETRO-FIT NOT POSSIBLE. PROVIDE NEW CONTROLS IF EXISTING ARE NOT WORKABLE.
8. NEW LIGHTING CONTACTORS. WIRE CONTACTORS TO EXISTING TIME CLOCK.
E.C. TO VERIFY THE OPERABLE CONDITION OF EXISTING TIME CLOCK PRIOR TO BID, REUSE IF POSSIBLE. PROVIDE NEW IF REQUIRED.
SEE CONTACTORS DETAIL ON SHEET E4.0.

NEW LIGHTING SWITCHBANK



'a,b,c,d' - SINGLE POLE SWITCHES FOR CONTROL OF SALES LIGHTING.

'ov' - 2-HR OVERRIDE BYPASS SWITCH. ADJUST TO ON/OFF SCHEDULE DIRECTED BY TENANT REPRESENTATIVE.

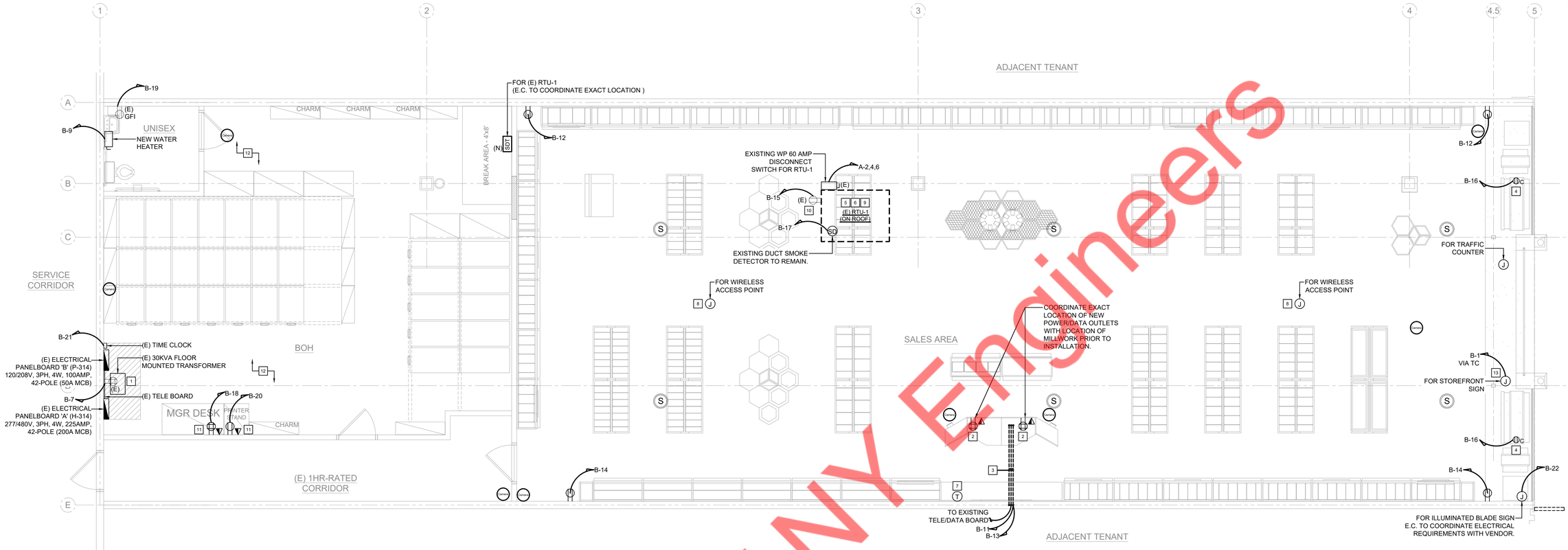
OS - CEILING MOUNTED OCCUPANCY SENSOR

OS$_D$ - WALL MOUNTED OCCUPANCY SENSOR WITH DIMMING CAPABILITIES (WATTSTOPPER PW-211 OR EQUAL) AT+46" A.F.F. SENSOR "ON" SETTING TO BE SET TO AUTOMATIC IN FIELD.

OS - WALL MOUNTED OCCUPANCY SENSOR (WATTSTOPPER PW-201 OR EQUAL), AT+46" A.F.F. SENSOR "ON" SETTING TO BE SET TO AUTOMATIC IN FIELD.

PH - CEILING MOUNTED PHOTO SENSOR FOR TOPLIT DAYLIGHT RESPONSIVE CONTROL.

^{3} - WALL MOUNTED MANUAL 3-WAY TOGGLE SWITCH.



NOTE:
ALL WIRES TO BE COPPER AND IN CONDUIT, INCLUDING LOW VOLTAGE

1 ELECTRICAL POWER PLAN
1/4" = 1'-0"

GENERAL NOTES

1. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF MECHANICAL EQUIPMENT.
2. FIRE ALARM SYSTEM BY FIRE ALARM CONTRACTOR. INSTALL AUDIO / VISUAL ALARM, P.A. SPEAKER, SMOKE CONTROL WIRING TO RTU PLUS ROOM SMOKE DETECTOR. EMPLOY LANDLORD'S APPROVED CONTRACTOR FOR ALL CONNECTIONS TO THE MALL MASTER ALARM SYSTEM.
3. ALL DUPLEX RECEPTACLES, LIGHT SWITCHES AND COVER-PLATES SHALL MATCH ADJACENT FINISHES. SEE ARCHITECTURAL FINISH SCHEDULE.
4. CONDUIT TO BE GROUPED IN PARALLEL RUNS SUPPORTED BY UNISTRUT HANGERS W/ 90 DEGREE BRANCH RUNS TO FIXTURES. ELECTRICAL CONTRACTOR TO COORDINATE WITH HVAC CONTRACTOR FOR LOCATION AND CLEARANCES FOR EQUIPMENT.
5. PROVIDE 120V, 20A DEDICATED CIRCUIT, IF REQUIRED, FOR FIRE ALARM. COORDINATE WITH LANDLORDS REPRESENTATIVE.
6. CIRCUITING MAY BE ADJUSTED IN THE FIELD AS CONDITIONS REQUIRE. PROVIDE A TYPE-WRITTEN PANEL SCHEDULE IN ALL PANELS.
7. CIRCUIT NUMBERS SHOWN ARE FOR REFERENCE ONLY. MAINTAIN EXISTING CIRCUIT OF EXISTING EQUIPMENT, DEVICES, FIXTURES, ETC. TO REMAIN.

CONTRACTOR TO ENSURE THAT ALL EXISTING OUTLET/RECEPTACLE TO REMAIN/RE-USE ARE IN GOOD WORKING CONDITION. REPLACE COVER PLATES WITH NEW TO MATCH NEW OUTLETS.

ALL MECHANICAL/HVAC EQUIPMENT TO REMAIN. UTILIZED EXISTING CIRCUIT. VERIFY IN FIELD. REFER TO MECHANICAL DRAWINGS FOR ADDITIONAL INFORMATION.

ALL RECEPTACLES WITHOUT TAG (E) ARE NEW TO BE PROVIDED AND INSTALLED BY CONTRACTOR.

NOTE: NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS.
ALL OUTLETS TO BE WHITE.
(E) - EXISTING (R) - EXISTING/RELOCATED
(C) - CEILING MOUNTED (F) - FLOOR MOUNTED

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	HOME RUN.
	DUPLEX RECEPTACLE @ 18" A.F.F. U.N.O. MOUNTED AT CODE HEIGHT.
GFCI	GROUND FAULT PROTECTED DUPLEX RECEPTACLE.
	QUAD RECEPTACLE @ 18" A.F.F. U.N.O. MOUNTED AT CODE HEIGHT.
USB	USB/ DUPLEX COMBINATION RECEPTACLE
SW	SHOW WINDOW OUTLET
	SINGLE OUTLET/SPECIAL RECEPTACLE
	FLOOR QUAD
	TELEPHONE RECEPTACLE AT +18"A.F.F., U.N.O.
	FLOOR TELEPHONE RECEPTACLE.
	DATA RECEPTACLE AT +18"A.F.F., U.N.O.
	TELEPHONE / DATA COMBINATION RECEPTACLE AT +18"A.F.F., U.N.O.
	FLOOR TELEPHONE / DATA COMBINATION RECEPT.
T	THERMOSTAT
P	POWER POLE.
	LIGHT SWITCH.
OS	WALL MOUNTED OCCUPANCY SENSOR AT +46" A.F.F.
OS	CEILING MOUNTED OCCUPANCY SENSOR.
J	JUNCTION BOX.
	DISCONNECT SWITCH.
	ELECTRICAL PANEL.
	FLOOR DUPLEX RECEPTACLE
SD	DUCT SMOKE DETECTOR
SDT	WALL MOUNTED SMOKE DETECTOR TEST STATION

ELECTRICAL LEGEND

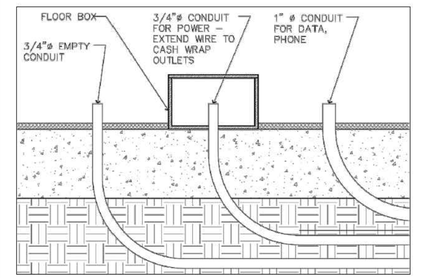
SD	DUCT SMOKE DETECTOR
SDT	WALL MOUNTED SMOKE DETECTOR TEST STATION
CM	SECURITY CAMERA
S	SPEAKER
NOTE:	NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS.

KEY NOTES

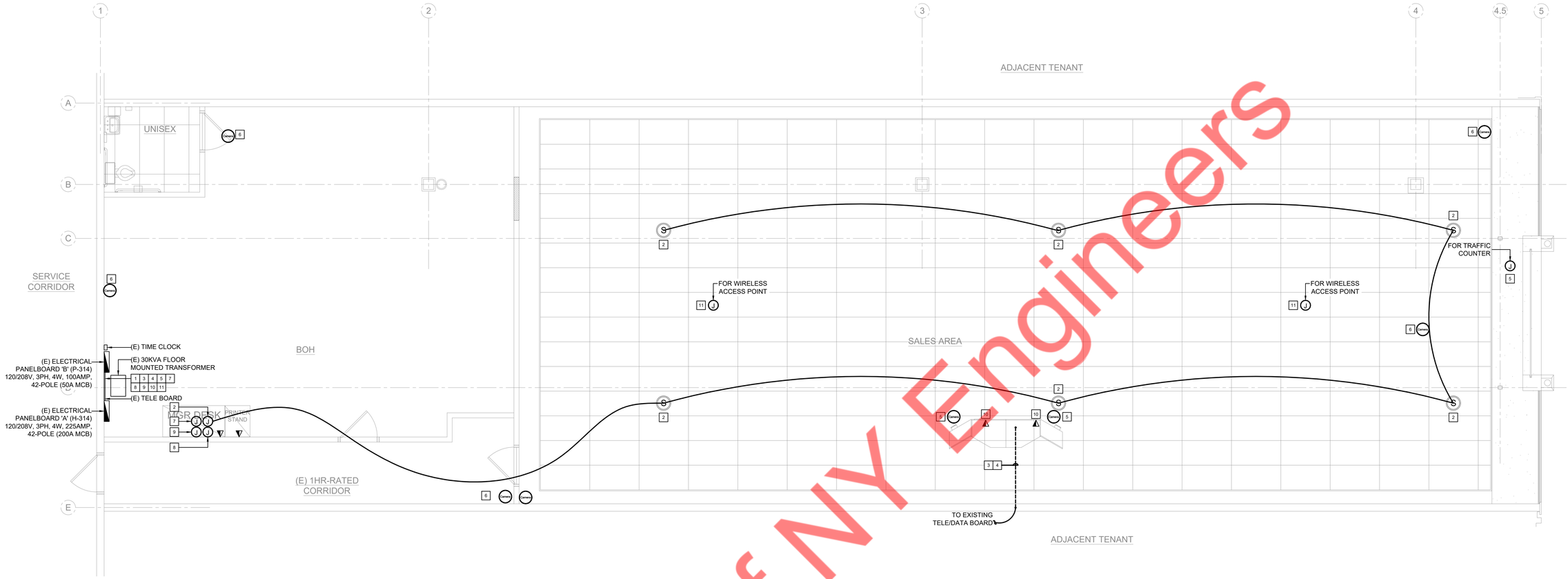
1. EXISTING ELECTRICAL PANEL'S SHALL REMAIN. E.C. SHALL VERIFY EXACT LOCATION, RATING, OPERABLE CONDITION IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY. E.C. SHALL MAINTAIN CLEARANCE FOR ELECTRICAL PANEL PER NEC 110.26 (A) (1). REFER SHEET E4.0 ELECTRICAL RISER DIAGRAM FOR MORE INFORMATION
2. PROVIDE SURFACE MOUNTED QUAD RECEPTACLES AND DATA OUTLETS ON BOTTOM OF CASHWRAP UNIT. EXTEND EXISTING POWER AND DATA CONDUITS AND WIRES FROM EXISTING LOCATION TO NEW QUAD RECEPTACLE AND DATA OUTLET LOCATION IF POSSIBLE (CONTRACTOR TO VERIFY IN FIELD PRIOR TO BID). OTHERWISE, PROVIDE NEW AS SHOWN.
3. APPROXIMATE LOCATION OF CONDUIT UNDER SLAB USE FOR CASH WRAP. IF POSSIBLE, REUSE EXISTING ELECTRICAL AND DATA LINES (CONTRACTOR TO VERIFY IN FIELD PRIOR TO BID). OTHERWISE, CONTRACTOR TO PROVIDE CONDUITS FOR NEW CASH WRAP. PROVIDE NEW (3) EMT CONDUITS: (1) 3/4" CONDUIT FOR POWER, (1) 1" CONDUIT FOR PHONE/DATA, AND (1) 3/4" FOR SPARE. PROVIDE CAPS AT ENDS OF EACH CONDUITS. TRENCH FLOOR AND ROUTE TO NEAREST WALL AND UP TO CEILING TO TELEPHONE/DATA BOARD AND EXISTING PANEL LOCATION. VERIFY TRENCHING REQUIREMENTS WITH LANDLORD'S REPRESENTATIVE PRIOR TO START OF WORK.
4. NEW CEILING MOUNTED SHOW WINDOW POWER OUTLET. COORDINATE EXACT LOCATION WITH ARCHITECT. E.C. TO FIELD VERIFY THE EXISTING SHOW WINDOW RECEPTACLE AVAILABILITY & OPERABLE CONDITION REUSE IF POSSIBLE, OTHERWISE PROVIDE NEW AS SHOWN ON PLAN.
5. E.C. SHALL COORDINATE WITH MECHANICAL/PLUMBING CONTRACTOR FOR EXACT LOCATION AND ELECTRICAL REQUIREMENTS OF MECHANICAL/PLUMBING EQUIPMENT IN FIELD AND PROVIDE THE ELECTRICAL CONNECTION ACCORDINGLY.
6. EXISTING ROOFTOP UNIT AND ASSOCIATED CIRCUITS TO REMAIN. UTILIZE EXISTING DISCONNECT IF IT'S IN OPERABLE CONDITION, PROVIDE NEW IF INOPERABLE.
7. CONTRACTOR TO PROVIDE 3/4" EMPTY EMT CONDUIT WITH PULL STRING FROM THERMOSTAT AND SENSOR (WHERE REQUIRED) TO MECHANICAL UNIT. VERIFY LOCATION IN THE FIELD.
8. NEW CEILING MOUNTED JUNCTION BOX AND DATA OUTLETS FOR WAP. COORDINATE EXACT LOCATION WITH ARCHITECT & COORDINATE WITH VENDER FOR REQUIREMENTS PRIOR TO INSTALLATION
9. CONTRACTOR SHALL ENSURE DUCT MOUNTED SMOKE DETECTOR IS PROPERLY WIRED TO EXISTING PANEL. NEW WALL MOUNTED SMOKE DETECTOR TEST STATION SHALL BE WIRED TO EXISTING PANEL AS NEEDED. COORDINATE WITH MECHANICAL CONTRACTOR IN FIELD AND VERIFY EXACT CONDITIONS IN FIELD PRIOR TO BID.
10. CONTRACTOR TO VERIFY IN FIELD ANY RECEPTACLE IS PRESENT WITHIN 25FT OF RTU. IF YES, EXISTING RECEPTACLES TO REMAIN. WIRE TO NEW AVAILABLE CIRCUIT IF NEEDED. VERIFY EXACT LOCATION. ELSE PROVIDE NEW WEATHER PROOF, GFI, 120V, 20A RECEPTACLE WITHIN 25FT OF THE RTU AS SHOWN.
11. QUAD RECEPTACLE AND TELE/DATA OUTLETS CENTERED AT +18" A.F.F. FOR NEW MANAGER'S DESK. VERIFY LOCATION IN THE FIELD.
12. CONTRACTOR TO PROVIDE NEW COVERS FOR EXISTING & RELOCATED WALL/FLOOR RECEPTACLES, FINAL COVER FINISH SHALL BE AS PER ARCHITECT.
13. NEW STOREFRONT SIGN. CONTRACTOR TO COORDINATE LOCATION IN FIELD. E.C. TO COORDINATE WITH SIGN VENDER FOR REQUIREMENTS PRIOR TO INSTALLATION.

CASHWRAP POWER DETAILS

NOTE:
COORDINATE ANY SAW-CUTTING OR CORE DRILLING OF SLAB WITH LANDLORD'S ONSITE REPRESENTATIVE PRIOR TO START OF WORK. WHERE REQUIRED, PROVIDE X-RAYING OF EXISTING SLAB



CONTRACTOR TO VERIFY SIZES OF EXISTING CONDUIT IN FIELD. CONTRACTOR TO USED CONDUIT SIZES ON THIS DETAIL IF EXISTING CONDUIT ARE UNDERSIZED.



1 LOW VOLTAGE PLAN
1/4" = 1'-0"

GENERAL NOTES

A. REFER TO MECHANICAL DRAWINGS FOR LOCATIONS OF MECHANICAL EQUIPMENT.

B. FIRE ALARM SYSTEM BY FIRE ALARM CONTRACTOR.

C. CONDUIT TO BE GROUPED IN PARALLEL RUNS SUPPORTED BY UNISTRUT HANGERS W/ 90 DEGREE BRANCH RUNS TO FIXTURES. ELECTRICAL CONTRACTOR TO COORDINATE WITH HVAC CONTRACTOR FOR LOCATION AND CLEARANCES FOR EQUIPMENT.

D. PROVIDE 120V, 20A DEDICATED CIRCUIT, IF REQUIRED, FOR FIRE ALARM. COORDINATE WITH LANDLORDS REPRESENTATIVE.

E. CIRCUITING MAY BE ADJUSTED IN THE FIELD AS CONDITIONS REQUIRE. PROVIDE A TYPE-WRITTEN PANEL SCHEDULE IN ALL PANELS.

F. CIRCUIT NUMBERS SHOWN ARE FOR REFERENCE ONLY. MAINTAIN EXISTING CIRCUIT OF EXISTING EQUIPMENT, DEVICES, FIXTURES, ETC. TO REMAIN.

G. I.T./SPEAKER CABLE SPECIFICATIONS:

- WHEN THE SALES AREA HAS OPEN CEILING , SUBSTITUTE LANMARK 350 STATION CABLE WHITE (PART# 10032070 PLENUM RATED.) FOR THE LANMARK 350 STATION CABLE BLUE AND BLACK.
- PROVIDE JUNCTION BOXES FOR NOTES 2, 5, 6 AND 11. QUANTITY AND LOCATION TO BE DETERMINED BY PROJECT MANAGERS FOR NOTES 5, 6 AND 11.

H. IF A LOW VOLTAGE PERMIT IS REQUIRED TO RUN THE CABLES THEN IT IS THE ELECTRICIAN'S RESPONSIBILITY TO OBTAIN THIS PERMIT AS WELL AS RESEARCH WHETHER IT IS NEEDED PRIOR TO THE START OF THE PROJECT.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
CM	SECURITY CAMERA
S	SPEAKER
NOTE:	NOT ALL SYMBOLS MAY APPEAR ON DRAWINGS.

KEY NOTES

1. EXISTING TELEPHONE BACKBOARD LOCATION (V.I.F.). ENSURE THERE IS CONDUIT FOR THE PHONE LINES AND 66 PHONE WIRING BLOCK. SEE ARCHITECTURAL PLAN FOR TELEPHONE BACKBOARD INFORMATION.
2. PROVIDE J-BOX ABOVE CEILING FOR SPEAKER LINE. RUN ONE SINGLE LINE BELDEN 6200UE 16 AWG PLENUM RATED SPEAKER WIRE (PART# 102-1102) (WHITE AT ALL TIMES) TO THE FIRST SPEAKER LOCATION AND CONTINUE IN A DAISY-CHAIN FASHION FOR THE REMAINING SPEAKER LOCATIONS.
3. PROVIDE 6 LINES OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO THE CASHWRAP LOCATION, LEAVING A SERVICE LOOP OF 12 FT FOR EACH LINE (FOR CASHWRAP DATA). (SEE GENERAL NOTES FOR OPEN CEILING IN SALES AREA).
4. PROVIDE 2 LINES OF LANMARK 350 STATION CABLE BLACK (PART# 10067869 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO THE CASHWRAP LOCATION, LEAVING A SERVICE LOOP OF 12 FT FOR EACH LINE (FOR CASHWRAP PHONE). (SEE GENERAL NOTES).
5. PROVIDE 4 LINES OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO THE FRONT DOOR LOCATION, LEAVING A SERVICE LOOP OF 12 FT FOR EACH LINE (FOR SECURITY CAMERAS AND TRAFFIC COUNTER). (SEE GENERAL NOTES).
6. PROVIDE 2 LINES OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO SECURITY CAMERAS. (SEE GENERAL NOTES FOR OPEN CEILING IN SALES AREA).
7. PROVIDE 4 LINES OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO JUNCTION BOX AT MANAGER'S DESK LOCATION, LEAVING 1FT OF SLACK CABLE LOCATE JUNCTION BOX AT 18" A.F.F. (FOR MANAGER'S PC AND PRINTER). (SEE GENERAL NOTES FOR OPEN CEILING IN SALES AREA).
8. PROVIDE 2 LINES OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO THE MANAGER'S DESK AUDIO/VISUAL JUNCTION BOX AT 5'-6", LEAVING 1FT OF SLACK CABLE (SEE GENERAL NOTES).
9. PROVIDE 2 LINES OF LANMARK 350 STATION CABLE BLACK (PART# 10067869 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO A JUNCTION BOX AT MANAGER'S DESK LOCATION, LEAVING 1FT OF SLACK CABLE. LOCATE JUNCTION BOX AT 18" A.F.F. (FOR MANAGER'S PHONE AND FAX) (SEE GENERAL NOTES).
10. PROVIDE 3 LINES OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO ABOVE CASHWRAP, LEAVING A SERVICE LOOP OF 12FT. (SEE GENERAL NOTES).
11. PROVIDE 1 LINE OF LANMARK 350 STATION CABLE BLUE (PART# 10032063 PLENUM RATED) FROM THE TELEPHONE BACKBOARD TO THE MIDDLE OF THE STORE, LEAVING A SERVICE LOOP OF 12FT (FOR THE WAP). (SEE GENERAL NOTES FOR OPEN CEILING IN SALES AREA). PROVIDE ENOUGH EXTRA CABLING FOR FUTURE CAMERA AND SHOPPERTRACK NEAR ENTRY DOORS.

ELECTRICAL PANEL SCHEDULE AND LOAD SUMMARY

ELECTRICAL PANEL SCHEDULE

PANELBOARD			A (H-314)	VOLTAGE		277 / 480 V	PHASE		3	WIRE		4							
PANEL TYPE			PRL-2A	MAINS		200A MCB	BUS RATING		225	AIC RATING		FIELD VERIFY							
NEMA TYPE ENCLOSURE			1	MOUNTING		SURFACE	OPTIONS			NOTE		EXISTING PANEL							
CKT. NO.	EQT TAG	CKT TAG	DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION	CKT TAG	EQT TAG	CKT. NO.
1		(E)	SPARE	1		20		A	11,000							2
3		(E)	SPARE	1		20		B	11,000	50	6	3	ROOF TOP UNIT-1	(E)		4
5		(E)	SPARE	1		20		C	11,000							6
7		(E)	SPARE	1		20		A		20		1	SPACE			8
9			SPACE	1		20		B		20		1	SPACE			10
11		(E)	SPARE	1		20		C		20		1	SPACE			12
13			SPACE	1		20		A		20		1	SPACE			14
15			SPACE	1		20		B		20		1	SPACE			16
17			SPACE	1		20		C		20		1	SPACE			18
19			SPACE	1		20		A		20		1	SPACE			20
21			SPACE	1		20		B		20		1	SPACE			22
23			SPACE	1		20		C		20		1	SPACE			24
25			SPACE	1		20		A		20		1	SPACE			26
27			SPACE	1		20		B		20		1	SPACE			28
29			SPACE	1		20		C		20		1	SPACE			30
31			SPACE	1		20		A		20		1	SPACE			32
33			SPACE	1		20		B		20		1	SPACE			34
35			SPACE	1		20		C		20		1	SPACE			36
37							5,000	A		20		1	SPACE			38
39		(E)	30 KVA TRANSFORMER	3	10	30	5,000	B		20		1	SPACE			40
41							5,000	C		20		1	SPACE			42

ALL PHASES TO BE BALANCED T0 WITHIN 7%

A= 16,000 WATTS

B= 16,000 WATTS

C= 16,000 WATTS

TOTAL CONNECTED LOAD	48,000	WATTS	58	AMPS
TOTAL DEMAND LOAD	47,813	WATTS	58	AMPS

(E) EXISTING TO REMAIN
(N) NEW CIRCUIT
GFCI GROUND FAULT CURRENT INTERRUPTER
IG CIRCUITS WITH ISOLATED GROUND
TC CIRCUITS ON TIMECLOCK
EMS ROUTING TO THE EMS PANEL
C BREAKER LOCK
a,b,c SWITCHES CONTROLLING LIGHTS

ELECTRICAL PANEL SCHEDULE [1] [2]

PANELBOARD			B (P-314)	VOLTAGE		120 / 208 V	PHASE		3	WIRE		4							
PANEL TYPE			PRL-1A	MAINS		50A MCB	BUS RATING		100	AIC RATING		FIELD VERIFY							
NEMA TYPE ENCLOSURE			1	MOUNTING		SURFACE	OPTIONS			NOTE		EXISTING PANEL							
CKT. NO.	EQT TAG	CKT. TAG	DESCRIPTION	POLE	WIRE SIZE	BKR. SIZE	TOTAL WATTS	PHASE	TOTAL WATTS	BKR. SIZE	WIRE SIZE	POLE	DESCRIPTION	CKT TAG	EQT TAG	CKT. NO.
1	C1	(N)	STORE FRONT SIGN	1	12	20	1,200	A	750	20	12	1	TRACK LIGHT SALES AREA	(N)	C2/d	2
3	C1	(N)	RECESSED LIGHT SALES AREA	1	12	20	200	B	750	20	12	1	TRACK LIGHT SALES AREA	(N)	C2/c	4
5		(N)	R.R./BOH AREA LIGHTING	1	12	20	1,200	C	200	20	12	1	DOWN LIGHT SALES AREA	(N)	C2/b	6
7		(E)	TELEPHONE OUTLET	1	12	20	360	A	250	20	12	1	DOWN LIGHT SALES AREA	(N)	C2/a	8
9		(E)	WATER HEATER	1	10	30	2,500	B	360	20	12	1	PENDANT LIGHT SALES AREA	(N)	C2/e	10
11		(N)	CASHWRAP ISO GRND OUTLET	1	12	20	360	C	360	20	12	1	SALES OUTLET	(N)		12
13		(N)	CASHWRAP OUTLET	1	12	20	360	A	360	20	12	1	SALES OUTLET	(N)		14
15		(E)	ROOF GFI/WF RECEPTACLE	1	12	20	360	B	1,000	20	12	1	SHOW WINDOW RECEPTACLES	(N)	C1	16
17		(E)	RTU SMOKE DETECTOR	1	12	20	100	C	360	20	12	1	MANAGER DESK OUTLET	(N)		18
19		(E)	RESTROOM OUTLET	1	12	20	180	A	500	20	12	1	PRINTER	(N)		20
21		(N)	TIME CLOCK	1	12	20	100	B	1,200	20	12	1	BLADE SIGN	(N)		22
23		(E)	SPARE	1		20		C		20		1	SPARE	(N)		24
25		(N)	SPARE	1		20		A		20		1	SPARE	(N)		26
27		(N)	SPARE	1		20		B		20		1	SPARE	(N)		28
29		(N)	SPARE	1		20		C		20		1	SPACE			30
31		(N)	SPARE	1		20		A		20		1	SPACE			32
33			SPACE	1		20		B		20		1	SPACE			34
35			SPACE	1		20		C		20		1	SPACE			36
37			SPACE	1		20		A								38
39			SPACE	1		20		B		50	6	3	MAIN	(E)		40
41			SPACE	1		20		C								42

ALL PHASES TO BE BALANCED T0 WITHIN 7%

A= 3,960 WATTS

B= 6,470 WATTS

C= 2,580 WATTS

TOTAL CONNECTED LOAD	13,010	WATTS	37	AMPS
TOTAL DEMAND LOAD	14,813	WATTS	42	AMPS

(E) EXISTING TO REMAIN
(N) NEW CIRCUIT
GFCI GROUND FAULT CURRENT INTERRUPTER
IG CIRCUITS WITH ISOLATED GROUND
TC CIRCUITS ON TIMECLOCK
EMS ROUTING TO THE EMS PANEL
C BREAKER LOCK
a,b,c SWITCHES CONTROLLING LIGHTS

ELECTRICAL LOAD SUMMARY

DESCRIPTION	NEC CONNECTED kW	VOLT	PHASE	NEC DEMAND FACTOR	NEC DEMAND kW
LIGHTING- 120V	2.3	120	1	1.25	2.9
TRACK LIGHTS	1.5	120	1	TRACK LENGTH	1.9
RECEPTACLES	3.3	120	1	>10kW=10+[0.5*(kW-10)]	3.3
STOREFRONT SIGN	2.4	120	1	1.25	3.0
S/W OUTLETS	1.0	120	1	1.25	1.3
ROOFTOP UNITS	33.0	480	3	1.00	33.0
HOT WATER HEATER	2.5	120	1	1.00	2.5
TOTALS	46.0				47.8

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 = MINIMUM FEEDER AMPERAGE

47.8 x 1000 = 47,813

480 x 1.732 = 831

57.5 AMPS USE (EXISTING) 200AMP SERVICE.

PANEL SCHEDULE GENERAL NOTES:

1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES ON FIELD AND INFORM ENGINEER FOR DISCREPANCIES.
2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
3. ALL EXISTING TO REMAIN ELECTRICAL DEVICES/EQUIPMENTS SHALL BE CONNECTED TO RESPECTIVE NEW/EXISTING PANELS. E.C. TO VERIFY EXACT DETAILS & CIRCUIT NUMBER ON FIELD.
4. ELECTRICAL CONTRACTOR TO COORDINATE WITH THE MANUFACTURER OF EQUIPMENT FOR THE WIRE SIZE & RATING OF MOCP BEFORE THE COMMENCEMENT OF WORK.
5. ELECTRICAL CONTRACTOR TO COORDINATE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF PLUMBING/MECHANICAL EQUIPMENTS WITH RESPECTIVE SYSTEM CONTRACTOR/OWNER/ARCHITECT.
6. E.C. SHALL VERIFY THE EXACT CIRCUIT, CIRCUIT NUMBER IN FIELD & ADJUST / MODIFY CIRCUITING AS REQUIRED.

EXISTING PANELBOARD KEYED NOTE: [#]

1. NEW BREAKERS MAY BE REQUIRED FOR USE IN THE EXISTING PANELBOARD TO MATCH RATING INDICATED IN THE PANEL SCHEDULE. PRIOR TO BID/PRICING, THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL EXISTING-TO-REMAIN PANELBOARD MANUFACTURER AND MODEL NUMBER TO ENSURE THAT REPLACEMENT BREAKERS ARE AVAILABLE. WHERE BREAKER AVAILABILITY ISSUES ARISE, NOTIFY THE PROJECT MANAGER PRIOR TO BID/PRICING.
2. DESIGNATED CIRCUIT NUMBER SHOWN ON THE PANEL SCHEDULE FOR A CERTAIN LOAD, MAY BE DIFFERENT THAN THE ACTUAL CIRCUIT NUMBER IN THE EXISTING PANELBOARD. ALL EXISTING-TO-REMAIN ELECTRICAL LOADS SHALL REMAIN CONNECTED TO THE SAME BREAKER AND CIRCUIT DESIGNATION. AVAILABLE SPARES AND SPACES SHALL BE UTILIZED TO FEED THE NEW LOADS.

CODE NOTE PER NEC 408.4: EVERY CIRCUIT AND CIRCUIT MODIFICATION SHALL BE LEGIBLY IDENTIFIED AS ITS CLEAR, EVIDENT, AND SPECIFIC PURPOSE OR USE. THE IDENTIFICATION SHALL INCLUDE SUFFICIENT DETAIL TO ALLOW EACH CIRCUIT TO BE DISTINGUISHED FROM ALL OTHERS. CIRCUIT DIRECTORY SHALL BE LOCATED ON THE FACE OR INSIDE THE PANEL DOOR IN THE CASE OF THE PANELBOARD.

CONTRACTOR TO VERIFY ANY EXISTING CIRCUITS TO REMAIN, MAINTAIN AS REQUIRED. CONTRACTOR TO MAKE UNUSED BRANCH CIRCUIT BREAKER SPARE AND AVAILABLE FOR NEW CIRCUIT.

ALL ELECTRICAL WORK SHALL BE DESIGNED PER 2017 NATIONAL ELECTRICAL CODE (NEC-2017), AND 2018 INTERNATIONAL ENERGY CODE (IECC-2018).

ALL ELECTRICAL EQUIPMENT SHALL BE LABELED, LISTED, OR CERTIFIED BY A NATIONALLY RECOGNIZED TESTING LABORATORY ACCREDITED BY THE UNITED STATES OCCUPATIONAL SAFETY HEALTH ADMINISTRATION.

THE MAXIMUM COMBINED VOLTAGE DROP ON BOTH INSTALLED FEEDER CONDUCTORS AND BRANCH CIRCUIT CONDUCTORS TO THE FARTHEST CONNECTED LOAD OR OUTLET SHALL NOT EXCEED 5 PERCENT.

ELECTRICAL RISER DIAGRAM

RISER DIAGRAM NOTES:

A. HVAC CIRCUIT BREAKERS TO BE "HACR" TYPE WHERE REQUIRED BY EQUIPMENT NAMEPLATE PER N.E.C.

B. BALANCE ALL PANELS AND ELECTRICAL EQUIPMENT, UNDER LOAD CONDITIONS, TO ±7% BETWEEN PHASES: A/B, B/C, C/A REGARDLESS OF CIRCUITING INDICATED. PROVIDE BALANCE SHEET TO CONSTRUCTION MANAGER AT PUNCHLIST.

C. 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.

D. MAKE ALL FINAL ELECTRICAL CONNECTIONS FOR A COMPLETE ELECTRICAL DISTRIBUTION SYSTEM. ALL CONNECTIONS/DISCONNECTIONS TO LANDLORDS/UTILITIES SERVICE EQUIPMENT SHALL BE AS DIRECTED BY LANDLORDS/UTILITIES SITE REPRESENTATIVE. TENANT GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TERMINATION/DETERMINATION EXPENSES.

F. SYSTEM SHALL BE GROUNDED TO THE MAIN BUILDING'S GROUNDING SYSTEM.

G. DISCONNECT SWITCHES AND PANELS SHALL BE INSTALLED ON PLYWOOD BACKERBOARDS.

H. TENANT CONTRACTOR MUST VERIFY ELECTRICAL SERVICE, SUB-FEED WIRING AND PANELS PRIOR TO START OF TENANT'S ELECTRICAL WORK. TENANT GENERAL CONTRACTOR SHALL MAKE APPLICATION TO THE LOCAL UTILITY FOR CONTINUED METERED ELECTRIC SERVICE IN THE TENANT'S NAME. TENANT GENERAL CONTRACTOR SHALL CONFIRM ALL LOCAL UTILITY GUIDELINES AND REQUIREMENTS PRIOR TO BID, SHALL INCLUDE THE COSTS OF THESE REQUIREMENTS IN THE BID, AND SHALL COMPLY WITH THEM DURING CONSTRUCTION. AVAILABLE FAULT CURRENT AT SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT PER NATIONAL ELECTRICAL CODE ARTICLE 110.24.

I. CONTRACTOR SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.

J. CONTRACTOR SHALL COORDINATE WITH BASE BUILDING FOR THE EXACT LOCATION OF THE EXISTING SWITCH GEAR AND EXACT POWER DISTRIBUTION .

K. CONTRACTOR SHALL VERIFY OPERABLE CONDITION INFIELD OF ALL EXISTING TO REMAIN ELECTRICAL DEVICES/EQUIPMENTS AND REPLACE WITH NEW IF FOUND INOPERABLE.

ELECTRICAL WORK BEING SHOWN IN SCHEMATIC IS EXISTING UNLESS OTHERWISE NOTED.

CONTRACTOR TO VERIFY EXISTING CONDUIT DURING BIDDING STAGE AND REPORT TO TENANT ARCHITECT ANY DISCREPANCIES THAT IS DIFFERENT THAN SHOWN ON PLANS.

CONTRACTOR TO PROVIDE NEW NAME PLATE ON ELECTRICAL METER FOR IDENTIFICATION.

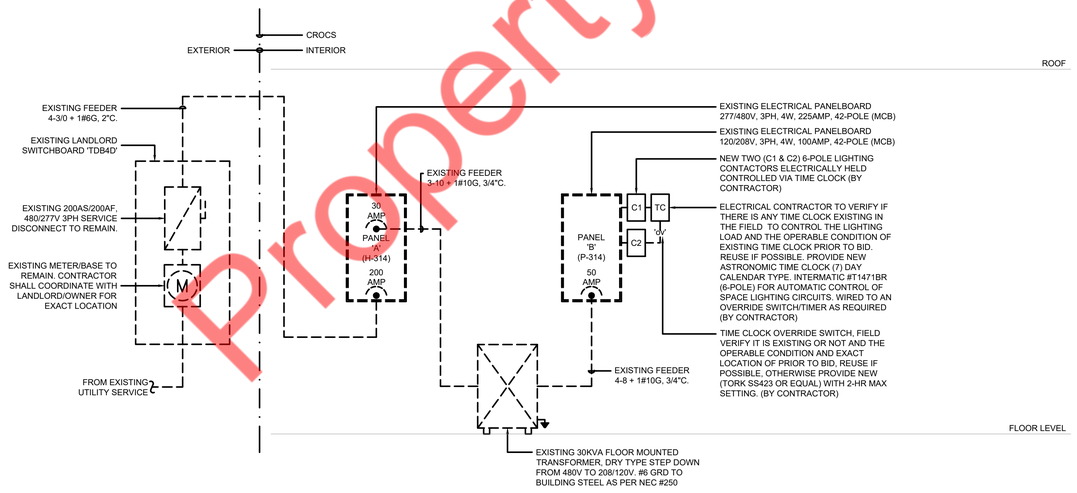
CONTRACTOR TO VERIFY IN FIELD THE EXACT USE OF THE EXISTING LIGHTING CONTACTORS PRIOR TO BID, REUSE IF POSSIBLE. PROVIDE NEW IF REQUIRED.
SEE CONTACTORS DETAIL ON SHEET E4.0.

VERIFY THE FOLLOWING PRIOR TO BID/ PRICING:

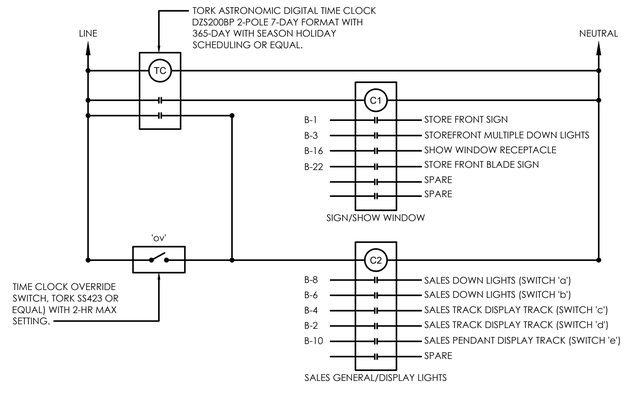
- EXISTING CONDUIT AND FEEDERS SIZE BETWEEN TENANT SPACE AND LANDLORD SWITCHBOARD.
- EXISTING MAIN SERVICE DISCONNECT RATING.
- EXISTING METER.

IF THE EXISTING SERVICE DISCONNECT AND FEEDERS ARE RATED FOR LESS THAN THE RATING SHOWN ON THIS RISER. NOTIFY THE PROJECT MANAGER AND ENGINEER IMMEDIATELY PRIOR TO SUBMITTING BID/ PRICING PACKAGE SO DRAWINGS CAN BE REVISED AND UPDATED ACCORDINGLY

LEGEND:
——— NEW
- - - - - - - - EXISTING



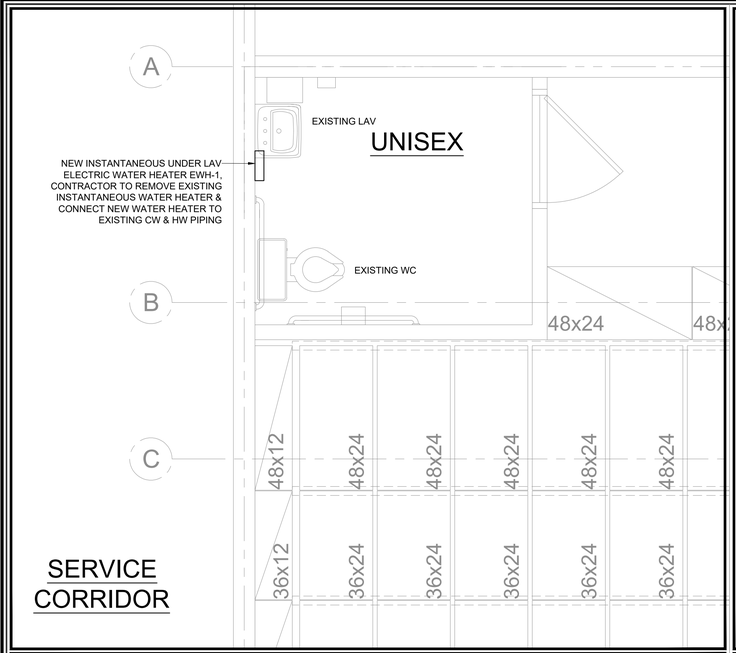
TIME CLOCK AND LIGHTING CONTACTOR DETAILS



TIME CLOCK SCHEDULE:

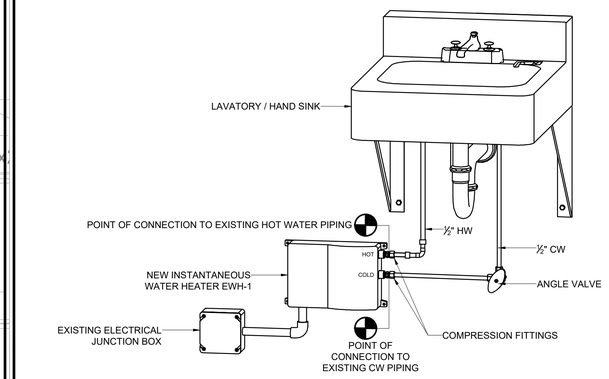
CONTRACTOR TO SET TIME CLOCK SETTINGS AND VERIFY WITH OWNER:

1. LIGHTING SHALL BE "ON" DAILY FROM 8:00AM TO 11:00PM.
2. DURING SET "OFF" TIME LIGHTING TO BE CONTROLLED BY A 2-HR MANUAL OVERRIDE SWITCH.



1 DOMESTIC WATER PLAN

SCALE: 1/2"=1'-0"



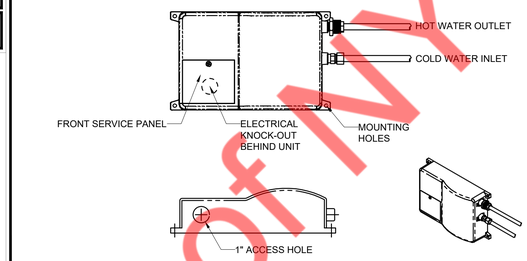
2 INSTANTANEOUS HEATER UNDER LAV / SINK INSTALLATION DETAIL

SCALE: N.T.S.

DESCRIPTION	MANUFACTURER / CATALOG NO.
WATER HEATER (EWH-1)	INSTANTANEOUS WATER HEATER (CHRONOMITE M-20L / 120-MM, 2.4 KW-120V-20 AMPS) - REFER TO ELECTRICAL SHEETS FOR VOLTAGE INFO.

3 PLUMBING FIXTURE SCHEDULE

SCALE: N.T.S.



4 INSTANTANEOUS ELECTRIC WATER HEATER EWH-1 DETAIL

SCALE: N.T.S.

1. IT IS THE INTENT OF THESE SPECIFICATIONS TO PROVIDE A COMPLETE INSTALLATION FOR FINISHED WORK, TESTED AND READY FOR OPERATION. THE WORK THROUGHOUT SHALL BE EXECUTED IN THE BEST AND MOST THOROUGH MANNER UNDER THE DIRECTION OF AND TO THE SATISFACTION OF THE OWNER.

2. ALL MATERIALS REQUIRED FOR THIS WORK SHALL BE NEW, UNUSED, BEST OF ITS RESPECTIVE KINDS, AND FREE FROM DEFECTS AND OF FIRST CLASS QUALITY. BASIS OF QUALITY SHALL BE LATEST STANDARDS OF ASTM, ANSI FEDERAL SPECIFICATIONS OR OTHER ACCEPTABLE STANDARDS.

3. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR WORK UNTIL ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.

4. THE PLUMBING CONTRACTOR SHALL GUARANTEE ALL WORK PERFORMED AND MATERIALS INSTALLED TO BE FREE FROM INHERENT DEFECTS AND SHALL KEEP IN REPAIR AND REPLACE ANY DEFECTIVE MATERIALS OF WORKMANSHIP, FREE OF COST TO THE TENANT (OWNER) FOR A PERIOD OF ONE (1) YEAR AFTER THE OPENING FOR BUSINESS.

5. ALL WORK SHALL BE DONE ACCORDING TO THE REQUIREMENTS OF ALL APPLICABLE CODES AND LEASE CRITERIA (IF APPLICABLE) AND SHALL RECEIVE THE APPROVAL OF ALL AUTHORITIES HAVING JURISDICTION. PREPARE ALL REQUIRED DOCUMENTS, DRAWINGS AND PERFORM ALL REQUIRED TESTS AND PAY ALL REQUIRED CHARGES TO OBTAIN THESE APPROVALS.

6. CONTRACTOR SHALL BE HELD TO HAVE EXAMINED THE SITE FOR THE WORK BEFORE HAVING SUBMITTED A PROPOSAL. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR CONDITIONS FOUND DURING THE COURSE OF THE CONTRACT.

7. THIS CONTRACTOR MUST PROVIDE LANDLORD'S CONSTRUCTION REPRESENTATIVE WITH COPIES OF REQUIRED INSURANCE AND COPIES TO BE FURNISHED TO THE OWNER BEFORE COMMENCING WORK.

8. SUBMIT THREE (3) SETS OF SHOP DRAWINGS IDENTIFIED WITH PROJECT NAME OF THE FOLLOWING (1) ELECTRIC HOT WATER HEATER OR INSINKERATOR (2) PLUMBING FIXTURES AND TRIM. CONTRACTOR SHALL SUBMIT SHOP DRAWING OF PIPING LAYOUT TO THE OWNER FOR THEIR FILE.

9. THE PLUMBING SUBCONTRACTOR IS A SUBCONTRACTOR OF THE TENANT'S GENERAL CONTRACTOR.

10. NOTCHING AND BORING OF STRUCTURAL STEEL MEMBERS IS NOT PERMITTED. WHEN HANGING FROM STRUCTURAL STEEL ONLY HANG FROM TOP FLANGE OF BEAMS AND TOP CHORDS ONLY AT PANEL POINTS OF JOISTS / TRUSSES.

I. WORK RESPONSIBILITY

1. FURNISH ALL LABOR, MATERIALS, EQUIPMENT AND CONTRACTORS FOR A COMPLETE, SAFE INSTALLATION OF PLUMBING WORK IN FULL CONFORMITY WITH REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION AS INDICATED ON DRAWINGS AND/OR HEREIN SPECIFIED, INCLUDING IN GENERAL THE FOLLOWING:

2. SANITARY DRAINAGE CONNECTIONS TO PLUMBING FIXTURES AND EQUIPMENT REQUIRING SAME WITH FINAL CONNECTIONS TO EXISTING PREINSTALLED OUTLETS PROVIDED BY PRIOR TENANT(S) OR LANDLORD. PLUMBER SHALL VERIFY EXACT LOCATION OF WASTE PIPE OUTLET BEFORE SUBMITTING BID AND NOTIFY THE ARCHITECT OF ANY LOCATION DISCREPANCIES. PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CONCRETE SAWCUTTING REQUIRED TO MAKE THE FINAL CONNECTION TO THE EXISTING WASTE PIPING OR CAPPED OUTLET(S). SAWCUTTING, EXCAVATING, BACKFILLING AND NEW CONCRETE MUST MEET WITH THE LANDLORD'S APPROVAL.
A. SNAKE SANITARY FOR A DISTANCE OF 100 FEET AND REPORT ANY BLOCKAGE.
B. TEST WATER PRESSURE TO INSURE MINIMUM OF 50 PSI.

3. COMPLETE VENT SYSTEM, ALL FIXTURES INDIVIDUALLY VENTED WITH FINAL CONNECTION THROUGH ROOF OR TO EXISTING LANDLORD SUPPLIED COMMON VENT. ROOF PENETRATION AND FLASHING TO BE PERFORMED BY LANDLORD'S ROOFER (IF APPLICABLE). COST OF ROOF PENETRATION AND FLASHING TO BE PART OF THIS CONTRACT, UNLESS NOTED OTHERWISE IN BID PROPOSAL (IF APPLICABLE).

4. DOMESTIC WATER SUPPLY SYSTEM INCLUDING CONNECTION TO EXISTING CAPPED OUTLET AND FINAL CONNECTIONS TO PLUMBING FIXTURES AND EQUIPMENT REQUIRING SAME. VERIFY EXACT LOCATION AND SIZE BEFORE SUBMITTING BID.

5. INSULATION OF ALL HOT AND COLD WATER PIPING, INCLUDING UNDER LAVATORY A.D.A. PIPE WRAPPINGS.

6. FURNISH AND INSTALL WATER METER (IF APPLICABLE) ACCESSIBLE TO UTILITY COMPANY OR LANDLORD'S REPRESENTATIVE FOR MONITORING WATER, BUT METER SHOULD IN NO WAY BE IN THE PATH OF THE A.D.A./CABO-ANSI, 5'-0" CIRCULAR PATTERN.

7. COSTS FOR WORKING BELOW TENANT'S SLAB IN ANOTHER TENANT'S SPACE.

8. INSTALLATION OF FLOOR DRAIN, BACKFLOW PREVENTER (IF REQ. BY CODE) PER LANDLORD REQUIREMENT AND CLEANOUT PER LOCAL CODE. COORDINATE ALL LOCATIONS WITH OPERATIONS MANAGER.

II. GENERAL ITEMS

1. SLEEVES: PROVIDE #22 GAGE GALVANIZED IRON PIPE SLEEVES FOR PIPING THROUGH WALLS AND FLOOR, PACK WITH NON-ASBESTOS ROPE AND FILL WITH EXPANDO NON-SHRINKING CEMENT.

2. ESCUTCHEONS: PROVIDE EXPOSED PIPING, BOTH BARE AND COVERED, WITH CP CAST BRASS ESCUTCHEONS WHERE PASSING THROUGH FLOORS, CEILINGS, WALLS OR PARTITIONS.

3. HANGERS AND SUPPORTS: SUPPORT HORIZONTAL DRAINAGE PIPING AT LEAST EVERY 5 FEET OR AT EVERY HUB, COPPER TUBING EVERY 7 FEET AND STEEL PIPE EVERY 10 FEET WITH "CLEVIS" HANGERS AND INSULATION PROTECTION SHIELDS. PIPING SHALL NOT BE SUPPORTED FROM BRIDGING OR OTHER PIPING. ONLY SUPPORT FROM TOP FLANGES OF BEAMS AND TOP CHORDS AT PANELS OF JOIST AND TRUSSES. PROVIDE SWAY AND SEISMIC BRACING WHERE REQUIRED BY CODES.

4. TEST: TEST PIPING AND PROVE TIGHT FOR AT LEAST TWO HOURS IN ACCORDANCE WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION AND/OR AS SPECIFIED. TEST SHALL BE PERFORMED IN THE PRESENCE OF OWNER'S REPRESENTATIVE AND LOCAL INSPECTOR. TEST SHALL BE REPEATED IF NECESSARY UNTIL FINAL APPROVAL OF SYSTEM IS OBTAINED.
A. TEST DRAINAGE AND VENT PIPING BY FILLING WITH WATER TO OVERFLOWING AT ROOF. WATER LEVEL TO REMAIN.
B. TEST WATER PIPING WITH WATER 1 1/2 TIMES THE WORKING PRESSURE.

5. STERILIZATION OF DOMESTIC WATER SYSTEM: BEFORE BEING PLACED IN SERVICE, ALL WATER LINES SHALL BE CHLORINATED TO THE SATISFACTION OF THE ARCHITECT OR LANDLORD'S REPRESENTATIVE, IN ACCORDANCE WITH A.W.W.A. SPECIFICATION C651-05.

6. SLOPE WASTE LINES 2 INCHES AND SMALLER NOT LESS THAN 1/4 INCH PER FOOT. SLOPE LARGER MAINS NOT LESS THAN 1/8 INCH PER FOOT.

7. INSTALL A CLEANOUT AT BASE OF EACH SOIL STACK, AT EACH CHANGE IN DIRECTION, AT INTERVALS NOT OVER 50 FEET AND ELSEWHERE AS SHOWN ON DRAWINGS OR REQUIRED BY LOCAL CODE. CLEANOUTS SHALL NOT BE INSTALLED IN PUBLIC AREAS WITHOUT SPECIFIC PERMISSION BY TENANT'S CONSTRUCTION MANAGER.

III. MATERIALS

1. DRAINAGE AND VENT PIPING: EXTRA HEAVY HUB AND SPIGOT CAST IRON SOIL WITH RUBBER GASKETS CONFORMING TO ASTM C564. NO-HUB CAST IRON TO HAVE HEAVY DUTY, TYPE 304 STAINLESS STEEL COUPLINGS CONFORMING TO ASTM A 666, 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.

2. WATER PIPING BELOW SLAB: TYPE K HARD COPPER TUBING, WITH CAST BRONZE OR WROUGHT COPPER SOLDER JOINT FITTINGS USING 95-5 SOLDER. WATER PIPING ABOVE SLAB: TYPE L HARD COPPER TUBING USING SILVER SOLDER. ALL WATER SUPPLY PIPING TO CONFORM TO NSF/ANSI 61 AND ASTM B 75, ASTM B 88, ASTM B 251, OR ASTM B 447. ALL PIPE FITTINGS SHALL CONFORM TO ASSE 1061, ASME B 16.15, ASME B 16.18, ASME B 16.22, ASME B 16.23, ASME B 16.26, AND ASME B 16.29.

3. 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.

4. 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.

5. PRESSURE AND TEMPERATURE RELIEF VALVE: WATTS REGULATING CO. MODEL 10L, T&P RELIEF VALVE SHALL CONFORM TO ANSI Z21.22.

6. AIR VENT: HOFFMAN #79 WATER MAIN VENT VALVE.

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

IV. INSULATION

1. ALL HOT AND COLD WATER PIPING AND FITTINGS SHALL BE INSULATED WITH 1" THICK RIGID FIBERGLASS WITH VAPOR BARRIER UNIVERSAL JACKET PASTED WITH VAPOR BARRIER CEMENT. VAPOR BARRIER NOT REQUIRED ON HOT WATER PIPING.

2. ALL ADA CONFORMING, WHEELCHAIR ACCESSIBLE LAVATORY P-TRAP AND ANGLE VALVE ASSEMBLIES TO BE COVERED WITH THE MOLDED, ANTIMICROBIAL TRUBRO, INC "LAV-GUARD" UNDERSINK PROTECTIVE PIPE COVER MODEL #103.

V. SPECIFIC PLUMBING SPECIFICATIONS

1. 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.

2. 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.

VI. LANDLORD'S CRITERIA

1. 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.

V11. ELASTOMERIC WATERPROOFING MEMBRANE

1. DESCRIPTION: MANUFACTURER'S PROPRIETARY ELASTOMERIC COMPOUND FORMULATED FOR USE AS HEAVY DUTY WATERPROOF MEMBRANE UNDER CERAMIC TILE FLOORS.

2. REQUIRED IN WET AREAS:
a. TOILET ROOMS
b. FLOOR MUST PITCH TO FLOOR DRAIN.

3. ACCEPTABLE MANUFACTURERS:
a. BOSTIC CONSTRUCTION PRODUCTS, HUNTINGDON VALLEY, PA.
b. MAPEI CORPORATION, ELK GROVE VILLAGE, IL.
c. THE NOBLE COMPANY, GRAND HAVEN, MI.
d. LATICRETE INTERNATIONAL, BETHANY, CT.

4. INSTALLATION: (2 COATS)
a. INSTALL OVER CURED CEMENT MORTAR BED AND CONCRETE FLOORS AS APPLICABLE, IN STRICT COMPLIANCE WITH MANUFACTURER'S INSTRUCTIONS.
b. FLASH MEMBRANE 4" UP ADJACENT WALLS AND RESTRAINING SURFACES AS RECOMMENDED BY MANUFACTURER.
c. ALLOW MEMBRANE TO CURE PRIOR TO SETTING TILE.
d. DO NOT ALLOW CONSTRUCTION TRAFFIC ON MEMBRANE.
e. MUST BE SLEEVED AND CAULKED.

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 CONTRACTORS 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.

PLUMBING COMMENTS:

ANY CHANGES AND OR UPGRADES TO TENANT'S EXISTING PLUMBING SYSTEMS SHALL COMPLY WITH ALL CODES AND MALL CRITERIA.

ALL MAIN WATER LINES SHALL BE COPPER - PVC IS NOT PERMITTED THERE SHALL BE NO PIPING JOINTS OR FITTINGS INSTALLED IN WATER PIPING BELOW THE FLOOR SLAB. PEX IS AN ALTERATIVE, IF ALLOWABLE AND COMPLIANT WITH LOCAL CODE.

ALL DRAIN, WASTE AND VENT PIPING AND FITTINGS ABOVE GRADE MUST BE CAST IRON PIPE. (PVC IS ACCEPTANCE IN OUR NEW CONSTRUCTION AS LONG AS IT IS NOT INSTALLED IN A RETURN AIR PLENUM.)

PLUMBING IS NOT PERMITTED IN ANY DEMISING PARTITIONS. FUR OUT THE WALL AS NECESSARY.

EXHAUST AND PLUMBING VENTS SHALL BE LOCATED A MINIMUM OF 10-0" AWAY FROM ANY OUTSIDE AR INTAKE, AND 5-0" FROM ANY DEMISING WALL VERTICAL PLANE. ALL VENTS SHALL BE LOCATED OUTSIDE OF ANY SNOW DRIFT ZONES AS SPECIFIED ON THE CENTER'S DOCUMENTATION.

ALL PENETRATIONS TO ROOF MUST BE APPROVED BY LANDLORD. ALL RELATED ROOF WORK MUST BE DONE BY MALL'S DESIGNATED ROOFING CONTRACTOR. AT TENANT'S EXPENSE. COORDINATE AL WORK WITH PROPERTY MANAGEMENT ON SITE.

ANY UNUSED PLUMBING EQUIPMENT, PIPING, ETC., WITHIN OR SERVING THE PREMISES MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN. DO NOT ABANDON IN PLACE. ALL PENETRATIONS THROUGH THE ROOF SHALL BE PATCHED AND REPAIRED BY THE APPROVED ROOFING CONTRACTOR APPROVED BY PROPERTY MANAGEMENT.

IF NOT ALREADY EXISTING, INSTALL A SHUT OFF VALVE ON DOMESTIC WATER LINE INSIDE SPACE. EXISTING SHUT OFF VALVE TO THE SPACE SHALL SERVE AS THE POINT OF SERVICE TO THE TENANT SPACE.

ALL NEW PLUMBING (DOMESTIC WATER AND DRAIN WASTE VENT DWV PIPING) SHALL BE INSULATED WHERE EXPOSED OR IN PLENUM SPACES.

TENANT IS REQUIRED TO INSTALL A WATERPROOF MEMBRANE IN ALL WET AREAS OF THE SPACE. TENANT SHALL USE A 30 MIL POLYETHYLENE CLEAVAGE MEMBRANE (EQUAL TO NOBLESEAL TS) INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND ANSI A106. MEMBRANE MUST BE EXTENDED UP THE WALL A MINIMUM OF 6" OR EQUAL TO THE HEIGHT OF THE FLOOR BASE.

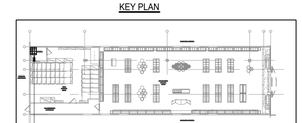
TENANT'S GENERAL CONTRACTOR SHALL ADVISE THE PROPERTY MANAGEMENT TEAM PRIOR TO ANY SLAB MODIFICATIONS OR REMOVAL. TENANT GC SHALL VERIFY THAT WORK SHALL NOT CONFLICT WITH ANY EXISTING STRUCTURAL, UTILITY, OF OTHER UNDER-SLAB CONDITION.(NON-DESTRUCTIVE VERIFICATION MAYBE REQUIRED.) ANY DAMAGE OR DOWNTIME CAUSED BY TENANTS WORK SHALL BE REPAIRED AND REIMBURSED AT TENANTS EXPENSE.

VAPOR BARRIER AND DOWELS MUST BE REVIEWED AND APPROVED BY THE PROPERTY'S OPERATION DIRECTOR PRIOR TO TRENCH CONCRETE BACKFILL WHERE THE SLAB IS SAW-CUT AND REMOVED FOR TRENCHING, LANDLORD REQUIRES TENANTS CONTRACTOR TO INSTALL APPROPRIATE MOISTURE BARRIER (STEGO 15 MIL THICK). CONFIRM WORK WITH CENTER OPERATIONS DIRECTOR BEFORE YOU BACKFILL.

GENERAL NOTE:

SOME TENANT SUITES HAVE FURRED OUT COLUMNS WITH ACCESS PANELS TO AN EXISTING CLEAN OUT OR EXPOSED ROOF DRAIN. TENANT WILL BE REQUIRED TO ALWAYS KEEP THIS ACCESS PANEL AREA CLEAR OF OBSTRUCTIONS. REFER TO PLUMBING DRAWINGS FOR PIPE LOCATIONS. EXISTING CONDUITS, EXPOSED LOW VOLTAGE WIRING, WATER PIPES, DRAIN LINES, ETC. MAY BE INSTALLED EITHER ABOVE THE EXISTING CEILING. INSIDE THE ORIGINAL CONCRETE SLAB OR JUST BELOW THE SLAB LANDLORD'S AS BUILT DRAWINGS MAY NOT ACCURATELY REFLECT THESE INSTALLATIONS. IT IS THE TENANT AND ITS CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATIONS OF ANY PIPE OR CONDUIT UNDER THE SLAB BY WHATEVER MEANS THE CONTRACTOR DEEMS APPROPRIATE PRIOR TO CUTTING THE SLAB. LIKEWISE, IDENTIFY ALL WIRING, CONDUITS, PIPING OR OTHER ITEMS IN THE ABOVE CEILING SPACE PRIOR TO REMOVING IT. ANY REPAIRS OR DAMAGES RESULTING FROM THE TENANT CONTRACTORS WORK WILL BE THAT CONTRACTORS RESPONSIBILITY TO REPAIR TO THE LANDLORDS SATISFACTION.

KEY PLAN



5 PLUMBING GENERAL NOTES & KEY PLAN

SCALE: N.T.S.