MECHANICAL SYMBOLS LIST

AC-1 TXF-1	EQUIPMENT SYMBOL
XX / X	RISER SYMBOL
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN
	EXHAUST GRILLE
DUCT ACCESSORIES	
BD	BACKDRAFT DAMPER
VD VD	VOLUME DAMPER W/ ACCESS DOOR
M	MOTORIZED DAMPER
	FIRE DAMPER
FSD	FIRE AND SMOKE DAMPER
UC	DOOR UNDERCUT
CONTROLS AND SENSORS	
T S	THERMOSTAT, SENSOR
S D	SMOKE DETECTOR
DUCTWORK	
	NEW SHEET METAL DUCTWORK & SIZE
	SUPPLY OR OUTSIDE AIR DUCT
	RETURN AIR DUCT
	DUCTWORK TRANSITION
	SUPPLY DUCT ELBOW UP OR DOWN
	RETURN DUCT ELBOW UP OR DOWN
	DUCT ELBOW WITH FIXED TURNING VANES
	DUCT BRANCH TAKE-OFF
	FLEXIBLE DUCTWORK

MECHANICAL ABBREVIATIONS

AHU	AIR HANDLING UNIT
BTU	BRITISH THERMAL UNIT
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET PER MINUTE
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
ESP	EXTERNAL STATIC PRESSURE
FC	FLEXIBLE CONNECTION
GC	GENERAL CONTRACTOR
HZ	FREQUENCY
MC	MECHANICAL CONTRACTOR
NC	NOISE CRITERIA
RTU	ROOFTOP UNIT
SEER	SEASONAL ENERGY EFFICIENCY RATIO
VD	VOLUME DAMPER
BOD	BOTTOM OF DUCT
BOE	BOTTOM OF EQUIPMENT
RTU	ROOF TOP UNIT
EG	EXHAUST GRILLE
TXF	TOILET EXHAUST FAN
RG	RETURN GRILLE
SG	SUPPLY GRILLE
ACCU	AIR COOLED CONDENSING UNIT
FR	FURNACE
CC	COOLING COIL

OHIO BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF OHIO BUILDING CODE 2024, AND ALL 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 OHIO MECHANICAL CODE 2024, CHAPTER 4.
3. AS PER C408.2.5 OF INTERNATIONAL ENERGY CONSERVATION CODE 2021, 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 C408.3.2 OF INTERNATIONAL ENERGY CONSERVATION CODE 2021, 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 OHIO BUILDING CODE 2024, REQUIREMENTS AS OUTLINES IN SECTION.
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 OHIO MECHANICAL CODE 2024 CHAPTER 4:
   A. MECHANICAL VENTILATION - SECTION 403.
8. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING - OHIO MECHANICAL CODE 2024.
   B. DUCT CONSTRUCTION AND INSTALLATION-SECTION 603 OF OHIO MECHANICAL CODE 2024.
   C. AIR INTAKES, EXHAUSTS AND RELIEF-SECTION 401 OF OHIO MECHANICAL CODE 2024.
   D. AIR FILTERS -SECTION 605 OF OHIO MECHANICAL CODE 2024.
   E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS -SECTION 513 OF OHIO MECHANICAL CODE 2024.
9. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
10. 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 OHIO MECHANICAL CODE 2024 CHAPTER 4 SECTION 403.3. HVAC SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS AS REQUIRED BY INTERNATIONAL ENERGY CONSERVATION CODE 2021 SECTION 408.2.2.
12. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
13. 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.
14. INDOOR DUCT AND PLENUM INSULATION SCHEDULE; (SECTION 230713)
   A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:
   B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

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

MECHANICAL DRAWING LIST

OHIO CODES AND REGULATIONS
2024 OHIO BUILDING CODE
2021 OHIO ENERGY CODE
2017 OHIO FIRE CODE
2021 INTERNATIONAL FUEL GAS CODE
2024 OHIO MECHANICAL CODE
2024 OHIO PLUMBING CODE

GENERAL NOTES

1. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

2. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.

3. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.

4. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

5. CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.

6. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL.

7. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.

8. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.

9. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.

10. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FIG. A MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.

11. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.

12. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).

13. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.

14. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

15. ACCESS DOORS ARE REQUIRED FOR ALL FANS, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.

16. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.

17. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

18. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

19. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

20. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE

21. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH 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.

23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.

24. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.

25. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

26. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.

27. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

28. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

29. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

30. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

DEFINITIONS:

1)"PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2)"INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3)"FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

SCOPE OF WORK

SCOPE OF WORK

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.

2. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

3. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

MECHANICAL GENERAL NOTES

1. ALL LOW PRESSURE BRANCH DUCTWORK (SUPPLY AND RETURN) SHALL BE PROVIDED WITH VOLUME CONTROL DAMPERS.
2. PROVIDE FIRE DAMPERS AT ALL FIRE RATED WALL PENETRATIONS AS REQUIRED. SHEET METAL ACCESS DOORS AS WELL AS ACCESS DOORS IN FINISHED CONSTRUCTION SHALL BE PROVIDE FOR ALL DAMPERS AS REQUIRED.
3. BORDER TYPES, COLOR, FINISHES, AND METHOD OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH THE ARCHITECTURAL CEILING DETAILS AND SPECIFICATIONS
4. THERMOSTATS SHOULD BE LOCATED 4'-0" A.F.F. IN THE CONFERENCE ROOM. TEMPERATURE SENSORS SHLL BE INSTALLED IN RETURN AIR DUCT OF RESPECTIVE RTU(SEE M-101). FINAL LOCATIONS TO BE VERIFIED WITH THE ARCHITECT. MANUFACTURER'S LOGO SHALL NOT BE EXPOSED.
5. WHERE PIPING CONNECTIONS FOR EQUIPMENT SUCH AS PUMPS, UNIT HEATERS, HEAT EXCHANGERS, ETC. DIFFER FROM THE LINE SIZE PIPING, IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO FURNISH AND INSTALL THE NECESSARY REDUCER/EXPANDER FITTINGS TO ENABLE CONNECTION BETWEEN THE PIPING SYSTEM AND THE EQUIPMENT.
6. REFER TO SCHEDULE SHEETS FOR THE DIFFUSER, GRILLE AND REGISTER SPECIFICATION.
7. HVAC DESIGN CRITERIA SHALL COMPLY WITH THE STATE ENERGY CONSERVATION CONSTRUCTION CODE, AND THE AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS (ASHRAE) GUIDELINES, ETC.
8. ALL METAL LOUVERS, AND ALL BLANK OFF PANELS (INSULATED OR NOT INSULATED, ACTIVE OR INACTIVE) FOR LOUVERS SHALL BE PROVIDED UNDER THIS SECTION OF THE SPECIFICATIONS. WIRE MESH SCREENS FOR LOUVERS SHALL BE PROVIDED BY THE LOUVER MANUFACTURER. ALL OTHER WIRE MESH SCREENS SHALL BE PROVIDED UNDER THIS SECTION OF THE SPECIFICATIONS.
9. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PRIOR TO PROCEEDING WITH ANY WORK. WHERE DISCREPANCIES OCCUR BETWEEN THESE DOCUMENTS AND EXISTING CONDITIONS, THE DISCREPANCY SHALL BE REPORTED TO THE OWNER AND/OR ENGINEER FOR EXPEDITING AND RESOLVE.
10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
11. ALL WORK SHALL BE PERFORMED IN A CLEAN AND WORKMANLIKE MANNER. CARE SHALL BE EXERCISED TO MINIMIZE ANY INCONVENIENCE OR DISTURBANCE TO OTHER AREAS OF THE BUILDING WHICH ARE TO REMAIN IN OPERATION. ISOLATE WORK AREAS BY MEANS OF TEMPORARY PARTITIONS AND/OR TARPS TO KEEP OUT DUST AND DIRT WITHIN THE CONSTRUCTION AREA.
12. WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.
13. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
14. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.
15. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.
16. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
17. ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
18. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
19. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
20. ALL RTU AND AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH RTU AND AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.
21. CONTRACTOR SHALL REPLACE ALL THE HVAC FILTERS AT THE TIME OF CERTIFICATE OF OCCUPANCY.
22. THESE DRAWINGS ARE DIAGRAMMATIC. DO NOT SCALE THESE DRAWINGS.
23. GC TO COORDINATE PIPING AND HVAC SCOPE SHOWN ON THESE PLANS BETWEEN PLUMBING AND HVAC CONTRACTORS.
24. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.

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ALTERATION OF:

LIGHTBRIDGE ACADEMY

SHEET TITLE:

MECHANICAL COVER SHEET

REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
M001

HVAC DUCTWORK - SHEET METAL

1.CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK,ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.

2.CONTRACTOR TO CHECK AND CORRECT ANY AND ALL DEFICIENCIES IN EXISTING DUCTS. ALL NEW DUCTWORK WILL COMPLY WITH THE LATEST SMACNA GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST HANDBOOKS PUBLISHED BY ASHRAE.

3.PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.

4.SUPPLY AND RETURN DUCTWORK 10' FROM ALL AC UNITS SHALL BE LINED WITH 1" ACOUSTICAL LINING.

5.RE-INSULATE ALL DUCTWORK AND PIPING IN WHICH INSULATION HAS BEEN REMOVED OR DAMAGED WITH INSULATION EQUAL TO THE EXISTING INSULATION.

6.CONTRACTOR SHALL SUPPLY AND INSTALL ALL NECESSARY SUPPLY DIFFUSERS AND RETURN AIR REGISTERS WHERE INDICATED ON THE DRAWING. COORDINATE LOCATION OF DIFFUSERS AND REGISTERS WITH REFLECTED CEILING PLAN.

7.IN CORRIDORS WHERE CEILING SPEAKERS AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE FIXTURES.

8.UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTER LINE) ABOVE THE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.

9.ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.

10. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.

11. PROVIDE ALL 90-DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN KITCHEN EXHAUSTS SHALL BE UN-VANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1-1/2 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.

12. COORDINATE DIFFUSER, REGISTER, AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.

13. ALL RTU AND AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.

14. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.

15. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS, AND OTHER EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

16. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.

17. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.

18. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

19. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.

20. PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.

21. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.

22. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.

23. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

24. EXTERIOR LOUVERS ARE INDICATED FOR SIZE, GENERAL LOCATION AND PERFORMANCE ONLY. DETAILED LOUVER DESCRIPTIONS ARE PROVIDED IN THE ARCHITECTURAL SPECIFICATIONS.

SPECIFICATIONS
SECTION 0001 - NOTICE TO BIDDERS
1.1 BIDDERS REPRESENTATIONS
A. THE BIDDER BY MAKING A BID REPRESENTS THAT:
THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.
B. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.
C. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.
D. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.
E. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.
1.2 EXISTING CONDITIONS AND COORDINATION
A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED THE BIDDER'S PERSONAL OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.
B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.
1.3 RESPONSIBILITIES
A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.
B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON-TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.
C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT-DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE-ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUT-DOWNS ARE TO BE KEPT TO A MINIMUM.
END OF SECTION 0001

SECTION 0101 - QUALITY OF WORK
1.1 WORKMANSHIP
A. ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
B. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST TO THE OWNER.
C. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.
1.2 CODE COMPLIANCE
A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.
END OF SECTION 0101
SECTION 0102 -REQUIRED DOCUMENTS
1.1 SHOP DRAWINGS
A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.
1.2 SUBMITTALS
A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.
1.3 RECORD DRAWINGS
A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.
1.4 EQUIPMENT OPERATING INSTRUCTIONS

A. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS,EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE ELECTRONIC COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.
END OF SECTION 0102

SECTION 078413-PENETRATION FIRE-STOPPING
1.1 QUALITY ASSURANCE
A. INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.
B. FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL
1.2 PENETRATION FIRESTOPPING
A. PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479.
C. PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.
D. W-RATINGS: PER UL 1479.
1.3 INSTALLATION
A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
1.4 FIELD QUALITY CONTROL
A. INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
1.5 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

FOR THE FOLLOWING SYSTEMS:
METALLIC AND NON-METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:
a.LATEX SEALANT
b.SILICONE SEALANT
c. INTUMESCENT PUTTY
d.MORTAR
h.SILICONE FOAM
i. PILLOWS/BAGS
j. INTUMESCENT WRAP STRIPS
k.INTUMESCENT COMPOSITE SHEET
1.6 MANUFACTURERS
1.HILTI CONSTRUCTION CHEMICAL, INC
2.TREMCO INC.
3.3M FIRE PROTECTION PRODUCTS
END OF SECTION 078413

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING
1.1 SLEEVE-SEAL SYSTEMS
A. FIELD-ASSEMBLED, MODULAR SEALING-ELEMENT UNIT FOR FILLING ANNULAR SPACE BETWEEN PIPING AND SLEEVE.
1.SEALING ELEMENTS: EPDM RUBBER OR NBR.
2.PRESSURE PLATES: CARBON STEEL, PLASTIC, STAINLESS STEEL.
3.CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION-RESISTANT COATING, STAINLESS STEEL.
B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1.ADVANCE PRODUCTS & SYSTEMS, INC.
2.CALPICO, INC.
3.METRAFLEX COMPANY (THE).
4.PIPELINE SEAL AND INSULATOR, INC.
5.PROCO PRODUCTS, INC.
1.2 SLEEVE-SEAL FITTINGS
A. MANUFACTURED PLASTIC, SLEEVE-TYPE, PLASTIC OR RUBBER WATER-STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.
1.3 GROUT
A. NON-SHRINK, FACTORY PACKAGED.
1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE
A. USE SLEEVES AND SLEEVE SEALS FOR THE FOLLOWING PIPING-PENETRATION APPLICATIONS:
1.INTERIOR PARTITIONS:
a.PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED-STEEL-PIPE SLEEVES. PVC-PIPE SLEEVES.
b.PIPING NPS 6 (DN 150) AND LARGER: GALVANIZED-STEEL-SHEET SLEEVES.
END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING
PART 2 - PRODUCTS
2.1 ESCUTCHEONS
A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED AND ROUGH-BRASS FINISH AND SETSCREW FASTENER.
B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.

2.2 FLOOR PLATES
A. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.
PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.
B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.
1.ESCUTCHEONS FOR NEW PIPING:
a.PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
b.INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE.
c. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
d.BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.

3.2 FIELD QUALITY CONTROL
A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS.
END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
1.1 PERFORMANCE REQUIREMENTS
A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
1.DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
2.DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND
3.DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
1.2 SUBMITTALS
A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER
1.3 QUALITY ASSURANCE
A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE - STEEL."
1.4 COMPONENTS
A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL
B. TRAPEZE PIPE HANGERS: CARBON OR STAINLESS STEEL
C. FIBERGLASS PIPE HANGERS: -CLEVIS, CENTURY COMPOSITES, COOPER B-LINE
D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER
E. FIBERGLASS STRUT SYSTEMS: COOPER B-LINE
F.THERMAL-HANGER SHIELD INSERTS:
G. FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS
H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB-MOUNTED TYPE
I. EQUIPMENT SUPPORTS.
END OF SECTION 230529

SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT
PART 1 - GENERAL
1.1 COMPONENTS
A. VIBRATION ISOLATORS:
1.ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2.MOUNTS: DOUBLE-DEFLECTION TYPE.
3.RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
4.SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
5.RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
6.HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7.ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
8.SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.

9.SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
10.PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
11.RESILIENT PIPE GUIDES.
B. AIR-MOUNTING SYSTEMS:
1.AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWS.
2.RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWS.

C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.
D. VIBRATION ISOLATION EQUIPMENT BASES:
1.STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
2.INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE

1.2 FIELD QUALITY CONTROL
A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.
PART-2 PRODUCTS
1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES
A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1.ACE MOUNTINGS CO., INC.
2.AMBER/BOOTH COMPANY, INC.
3.CALIFORNIA DYNAMICS CORPORATION.
4.HILTI, INC.
5.ISOLATION TECHNOLOGY, INC.
6.KINETICS NOISE CONTROL
7.LOOS & CO.; CABLEWARE DIVISION.
8.MASON INDUSTRIES.
9.TOLCO INCORPORATED; A BRAND OF NIBCO INC.
10. UNISTRUT; TYCO INTERNATIONAL, LTD.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC
1.1 SUMMARY
A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
1.AIR SYSTEMS: CONSTANT-VOLUME SYSTEMS
2.EXISTING SYSTEMS.
1.2 QUALITY ASSURANCE
A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION
A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
F.THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SSECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED
H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
J.ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.
END OF SECTION 230593

SECTION 230713 - DUCT INSULATION
1.1 QUALITY ASSURANCE
SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS, ACCORDING TO ASTME 84.

1.2 FIELD QUALITY CONTROL
A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:
A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION.
B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
UNCONDITIONED SPACES WITHIN BUILDING: R-6
WITHIN BUILDING ENVELOPE ASSEMBLY: R-8
OUTSIDE OF BUILDING: R-8

1.4 ITEMS NOT INSULATED:
1.FIBROUS-GLASS DUCTS.
2.METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1.
3.FACTORY-INSULATED FLEXIBLE DUCTS.
4.FACTORY-INSULATED PLENUMS AND CASINGS.
5.FLEXIBLE CONNECTORS.
6.VIBRATION-CONTROL DEVICES.
7.FACTORY-INSULATED ACCESS PANELS AND DOORS.
8.DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.5 PRODUCTS
A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
1.JOHNS-MANVILLE
2.OWENS-CORNING

1.6 ACOUSTICAL TREATMENT
1.WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED.
1.7 SEALANT MATERIALS
1.TWO-PART TAPE SEALING SYSTEM.
2.WATER-BASED JOINT AND SEAM SEALANT.
3.SOLVENT-BASED JOINT AND SEAM SEALANT.
4.FLANGED JOINT SEALANT.
5.FLANGE GASKETS.
END OF SECTION 230713

PIPING INSULATION

A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.
PIPING INSULATION SCHEDULE

SERVICE	SIZE	THICKNESS	FINISH
REFRIGERANT PIPING	<1.5"	1.5"	P-6
CONDENSATE PIPING	<1.5"	1.0"	P-6

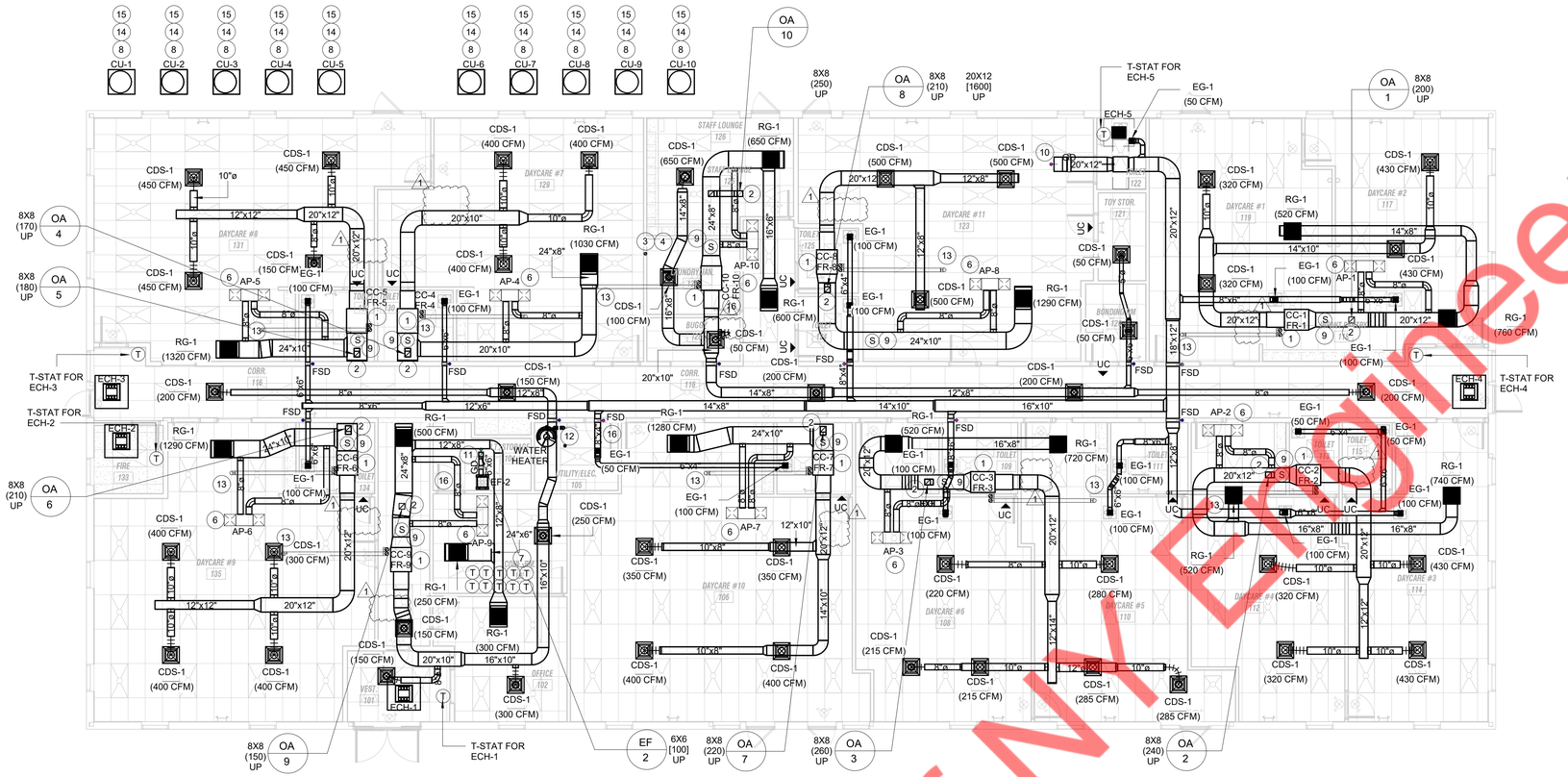
SECTION 233113 - METAL DUCTS
1.1 CONSTRUCTION
A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 2-1/2 INCH WG PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THESE STANDARDS, REGARDLESS OF THE VELOCITY IN THE DUCT.
B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 2" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:
1.DUCTWORK SHALL BE TRANSVERSELY JOINTED BY CONNECTING SEAMS OF COMPANION ANGLES, FORMED FROM 1-1/2"X1-1/2"X1/8" GALVANIZED ANGLES, TACK-WELDED OR RIVETED TO THE DUCT. THE ANGLE FRAME SHALL BE CONTINUOUSLY FLANGED UP INTO UPRIGHT OF ANGLE AND EACH CORNER SHALL BE FILLED IN AND GROUND SMOOTH. JOINTS SHALL BE GASKETED WITH 1/8" THICK REINFORCED GASKET, OVERLAPPED AT CORNERS, GASKET SIMILAR TO 3M-1202 OR APPROVED EQUAL.
2.RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL WELDED CONSTRUCTION.
3.HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6' CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.
4.LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.
5.RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.
6.ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.

C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:

USG MAX. SIDE INCHES TRANSVERSE JOINTS AND BRACING

USG	MAX. SIDE INCHES	TRANSVERSE JOINTS AND BRACING	
22	UP TO 12	S SLIP, DRIVE SLIP, ONE INCH	POCKET LOCK ON 8 FOOT CENTERS
22	13 TO 24	1"X1"X1/8" ANGLES ON 4 FOOT CENTERS	
20	25 TO 35	1"X1"X1/8" ANGLES ON 2 FOOT CENTERS	

D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:
1.UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2.DOWNSTREAM O



1 MECHANICAL FLOOR PLAN
1/8" = 1'-0"

GENERAL NOTES:

1. ALL DUCT SIZES SHOWN ON MECHANICAL FLOOR PLANS ARE CLEAR INSIDE.INTERNAL AND EXTERNAL INSULATION THICKNESS OF DUCTS SHALL BE CONSIDERED SEPARATELY.
2. PROVIDE OPPOSED BLADE VOLUME DAMPERS AT FACE OF ALL CEILING SUPPLY DIFFUSERS, RETURN AND EXHAUST GRILLES.
3. RUN CONTROL WIRING FROM TEMPERATURE SENSOR TO THE CORRESPONDING THERMOSTAT IN THE OFFICE.
4. RUN DUCTWORK TIGHT TO THE LOWEST STRUCTURE. SMALLER DUCTS TO BE RUN BETWEEN THE WEB JOIST AS MUCH AS POSSIBLE.
5. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS.
6. ALL DUCTWORK WITHIN THE ATTIC SPACE TO HAVE MINIMUM R-8 EXTERNAL INSULATION THAT IS AT LEAST 1.5 INCHES THK.
7. ALL PENETRATIONS REQUIRED FOR EQUIPMENT (DUCT, PIPES, ETC.) THROUGH ANY WALL SHALL BE PROPERLY SEALED OFF TO MAINTAIN THE INTEGRITY OF THE STRUCTURE.
8. PROVIDE VOLUME DAMPERS ON EACH BRANCH TAKE OFF FROM DUCT MAIN, AND ON EACH DIFFUSER TAKE OFF FROM BRANCH DUCT OR MAIN.
9. UNDERCUT ALL DOORS AS NOTED ON THIS PLAN 1"
10. FOR SUPPLY AND RETURN AIR DUCTS PROVIDE ACOUSTICAL LINING WITH R-6 INSULATION RATING UP TO 20' OF DUCT RUN FROM AC UNITS. PROVIDE R-6 THERMAL INSULATION AFTER 20' OF DUCT RUN FROM AC UNITS.

KEY NOTES:

1. PROVIDE FURNACE AND COOLING COIL AS PER MANUFACTURER SPECIFICATIONS. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS. PROVIDE CLEARANCES AS RECOMMENDED BY THE MANUFACTURER. PROVIDE DRIP PAN, LEAKDETECTOR, AND CONDENSATE PUMP. PROVIDE 1" CONDENSATE DRAIN FOR ALL HVAC UNITS AND RUN ALL CONDENSATE LINES TO THE NEAREST FLOOR DRAIN OR TO THE OUTSIDE, WHICHEVER ROUTE REQUIRES THE LEAST AMOUNT OF PIPING.COORDINATE FINAL LOCATION OF CONDENSATE TERMINATION WITH THE ARCHITECT.
2. 8"X8" OUTSIDE AIR DUCT TO ROOF.
3. PROVIDE DRYERBOX VENT BOX MODEL 350. RUN DRYER EXHAUST UP THROUGH THE ATTIC AND THROUGH THE ROOF. PROVIDE DRYER RATED ROOF CAP ON THE ROOF.
4. RUN 4" DIA. DRYER EXHAUST IN WALL FROM DRYER ON 1ST FLOOR LEVEL THROUGH THE ROOF. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS. PROVIDE ROOF CAP ON THE ROOF AT TERMINATION AND ELEVATE TERMINATION MINIMUM 24" ABOVE THE ROOF LEVEL. MAINTAIN 10' BETWEEN THE EXHAUST TERMINATION AND ANY FRESH AIR INTAKE. MAINTAIN 3' BETWEEN THE EXHAUST TERMINATION AND ANY OPERABLE OPENINGS TO THE BUILDING.
5. 1
6. PROVIDE AIR PURIFICATION SYATEM, AP, AND INSTALL AT THE RETURN AIR DUCTS AS PER MANUFACTURER SPECIFICATIONS.
7. PROVIDE T-STAT FOR ALL HVAC UNITS (10 TOTAL).STACK ALL THE T-STAT ON WALL.COORDINATE FINAL LOCATION WITH OWNER/ARCHITECT.
8. RUN REFRIGERANT PIPING FORM THE COOLING COIL TO CONDENSING UNIT ON GRADE.
9. PROVIDE REMOTE TEMPERATURE SENSOR IN RETURN AIR DUCT OF ALL HVAC UNITS WIRE BACK TO THE RESPECTIVE T-STAT LOCATED IN OFFICE.
10. EXHAUST AIR DUCT UP THROUGH ROOF. TERMINATE 24" ABOVE ROOF LEVEL WITH GOOSENECK & BIRD SCREEN. MAINTAIN 10' BETWEEN THE EXHAUST TERMINATION & FRESH AIR INTAKE. MAINTAIN 3' BETWEEN THE EXHAUST TERMINATION & ANY OPERABLE OPENINGS TO THE BUILDING. PROVIDE BACKDRAFT DAMPER.
11. PROVIDE CEILING EXHAUST FAN FOR IT TOOM. TERMINATE ON ROOF WITH GOOSENECK & BIRDSCREEN. 6"X6" EXHAUST DUCT UP TO ROOF, ENDS WITH A ROOF CAP.
12. RUN 4" COMBUSTION AIR AND 4" FLUE VENT UP TO ROOF. PROVIDE CAP AT THE TERMINATION AND ELEVATE TERMINATION MINIMUM 24" ABOVE THE ROOF LEVEL. MAINTAIN 10' BETWEEN THE EXHAUST TERMINATION & FRESH AIR INTAKE. MAINTAIN 3' BETWEEN THE EXHAUST TERMINATION & ANY OPERABLE OPENINGS TO THE BUILDING.
13. PROVIDE Ø5" VENT FOR GAS FURNACE EXHAUST AND COMBUSTION AIR INTAKE. PROVIDE AS PER MANUFACTURER'S RECOMMENDATATION.
14. COORDINATE FINAL LOCATION OF EQUIPMENT WITH ARCHITECT/OWNER.
15. INSTALL REFRIGERANT PIPING FROM INDOOR UNITS TO OUTDOOR UNITS AS PER MANUFACTURER RECOMMENDATION. PROVIDE WHETHER PROOF COATING FOR EXPOSED PIPING. PROVIDE PIPING INSULATION AS PER TABLE C403.12.3 OHIO ENERGY CODE 2021. CONTRACTOR TO COORDINATE WALL PENETRATION FOR REFRIGERANT PIPING WITH BASE BUILDING STRUCTURAL ENGINEER.
16. PROVIDE DOOR LOUVERS. COORDINATE WITH ARCHITECT.

DRYER VENT LENGTH CLACULATIONS	
VERTICAL RUN	20.0 FT
HORIZONTAL RUN	3.0 FT
90° ELBOW X2	10.0 FT
TOTAL EQ. LENGTH	33.0 FT
NOTE:	
1.THICKNESS OF DRYER EXHAUST DUCT MUST HAVE A MINIMUM OF 0.0157 INCHES (NO. 28 GAUGE).	
2.FINAL DRYER SELECTION SHALL HAVE EXHAUST LENGTH LIMITATIONS CAPABLE OF ACHIEVING THE DESIGNED LINE LENGTH.	

LAUNDRY ROOM LOUVER FREE AREA REQUIREMENT			
DRYER INPUT CAPACITY	SQ.IN/KBTUH REQUIRED	TOTAL CALCULATED FREE AREA	MINIMUM REQUIRED FREE AREA
60,000 BTU/HR	1	60 SQ.IN.	100 SQ.IN.
NOTE:			
1.SIZING REQUIREMENTS BASED ON OHIO FUEL GAS CODE 2021 304.5.3.1			
2.REFER TO ARCHITECTURAL DRAWINGS FOR FINAL LOUVER SPECIFICATION.			

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ALTERATION OF:

LIGHTBRIDGE ACADEMY

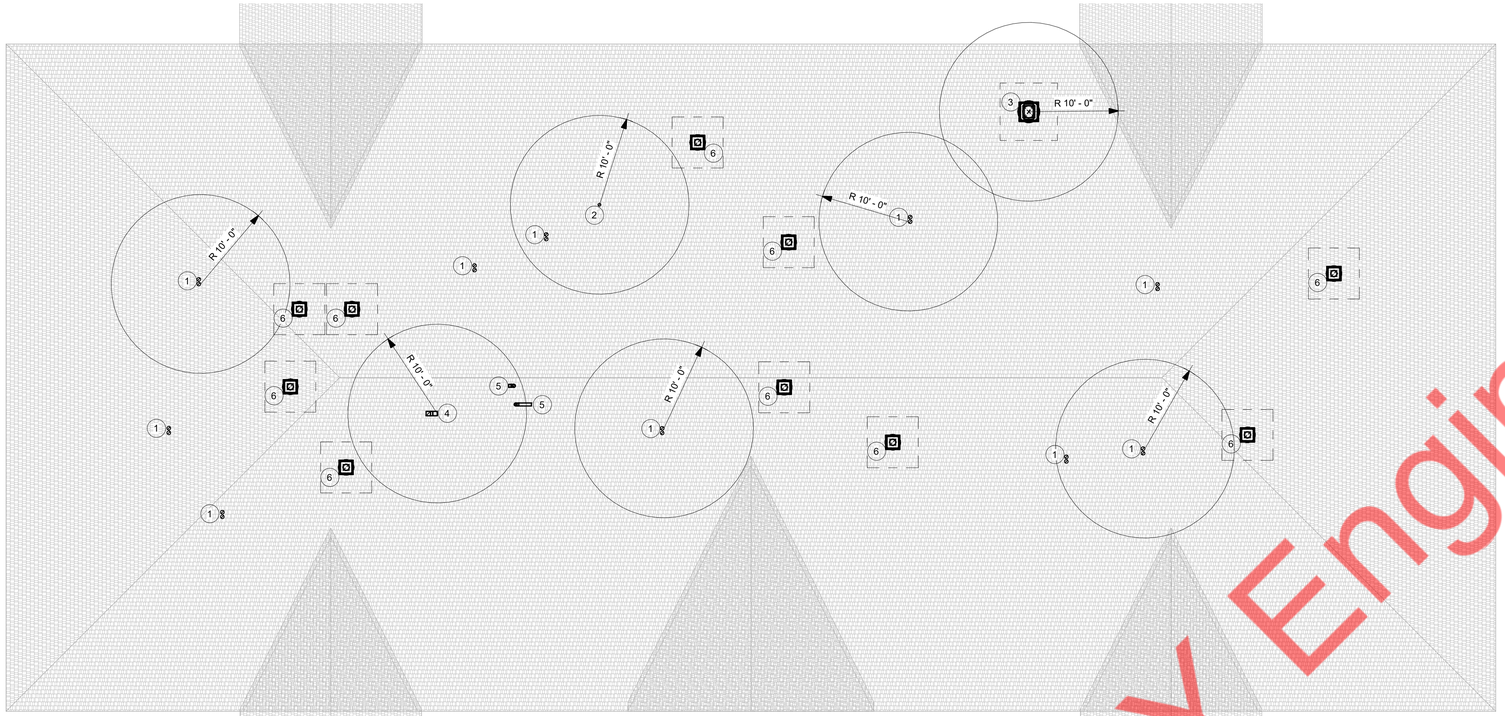
SHEET TITLE:

MECHANICAL FLOOR PLAN

REV.	DATE	REMARKS
1	11/12/2024	BLDG. DEPT. RESPONSES
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: Author
CHECKED BY: Checker

SHEET NO.
M101



1 MECHANICAL ROOF PLAN
1/8" = 1'-0"

ROOF GENERAL NOTES:

1. ALL PENETRATIONS REQUIRED FOR EQUIPMENT (DUCT, PIPES, ETC.) THROUGH ANY WALL, CEILING OR ROOF SHALL BE PROPERLY SEALED OFF TO MAINTAIN THE INTEGRITY OF THE STRUCTURE.
2. TERMINATE ALL EXHAUST DUCTS MINIMUM 24" ABOVE ROOF LEVEL WITH GOOSENECK & BIRD SCREEN. EXHAUST TO BE LOCATED MINIMUM 10 FT AWAY FROM ANY OUTSIDE AIR INTAKE & 3 FT AWAY FROM OPERABLE OPENINGS INTO BUILDING.

KEY NOTES:

1. PROVIDE Ø5" VENT FOR GAS FURNACE EXHAUST AND COMBUSTION AIR INTAKE. PROVIDE AS PER MANUFACTURER'S RECOMMENDATATION.
2. RUN 4" DIA. DRYER EXHAUST IN WALL FROM DRYER ON 1ST FLOOR LEVEL THROUGH THE ROOF. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS. PROVIDE ROOF CAP ON THE ROOF AT TERMINATION AND ELEVATE TERMINATION MINIMUM 24" ABOVE THE ROOF LEVEL. MAINTAIN 10' BETWEEN THE EXHAUST TERMINATION AND ANY FRESH AIR INTAKE. MAINTAIN 3' BETWEEN THE EXHAUST TERMINATION AND ANY OPERABLE OPENINGS TO THE BUILDING.
3. 20x12 EXHAUST DUCT DOWN TO EF-1. PROVIDE GREENHECK MODEL GRSR-15 GRAVITY RELIEF VENTILATOR ON ROOF. PROVIDE WITH INTEGRAL MOTORIZED DAMPER
4. 6"X6" EXHAUST DUCT DOWN TO EF-2, ENDS WITH A ROOF CAP. TERMINATE 10FT AWAY FROM ANY OUTSIDE AIR INTAKE.
5. ∅4" VENT FOR WATER HEATER FLUE VENT & COMBUSTION AIR INTAKE UP TO THE ROOF. CONTRACTOR TO INSTALL AS PER MANUFACTURER APPROVED RAIN AND TERMINATION CAP. ENSURE EXHAUST DISCHARGE IS A MINIMUM OF 10' AWAY FROM ANY OUTSIDE AIR.
6. PROVIDE GREENHECK MODEL GRSI GRAVITY INTAKE VENTILATOR ON ROOF, PROVIDE WITH INTEGRAL MOTORIZED DAMPER. PROVIDE SIZE 8 UP TO 200 CFM AND SIZE 10 UP TO 400 CFM.

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LIGHTBRIDGE ACADEMY

SHEET TITLE:

MECHANICAL ROOF PLAN

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DRAWN BY:	Author
CHECKED BY:	Checker

SHEET NO.
M102

AIR COOLED CONDENSING UNIT SCHEDULE

TAG	MANUFACTURER	MODEL	SEER2	COOLING CAPACITY			COMPRESSOR			OUTDOOR MOTOR		PIPING SIZE		ELECTRICAL					WEIGHT	REMARKS
				NOM TONS	TOTAL MBH	SENSIBLE MBH	RLA	LRA	REFRIG	HP	FLA	GAS	LIQ.	VOLTS	PHASE	HZ	MCA	MOCP	LBS	
CU-1	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-2	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-3	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-4	TRANE	4TTR4036N1	14.3	3.0	35.4	26.6	14.1	87.4	R-410A	1/8	0.77	3/4"	3/8"	208/230	1	60	18	30	156	1,2,3,4,5,6,7
CU-5	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-6	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-7	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-8	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7
CU-9	TRANE	4TTR4036N1	14.3	3.0	35.4	26.6	14.1	87.4	R-410A	1/8	0.77	3/4"	3/8"	208/230	1	60	18	30	156	1,2,3,4,5,6,7
CU-10	TRANE	4TTR4048N1	14.3	4.0	47.4	35.6	18.5	124.0	R-410A	1/5	1.05	7/8"	3/8"	208/230	1	60	24	40	189	1,2,3,4,5,6,7

NOTES:

1) PROVIDE POWER DISCONNECT REFER TO ELECTRICAL PLANS.
2) PROVIDE RUBBER ISOLATOR KIT FOR CONDENSING UNIT
3) UNITS SHALL BE RATED AT 95 DEG F DB / 75 DEG F WB.
4) PROVIDE NON-BLEED TXV KIT FOR COOLING COIL.
5) FASTEN CONDENSING UNIT TO CONCRETE PAD.
6) PROVIDE FURNACE WITH 2 STAGES OF HEAT.
7) SPLIT SYSTEMS MUST BE HIGH EFFICIENCY TYPE.

ELECTRIC HEATER SCHEDULE

TAG	MANUFACTURER	MODEL	LOCATION	MOUNTING	TOTAL CAPACITY	ELECTRICAL				WEIGHTS	NOTES
					KW	VOLTS	PHASE	HZ	MCA		
ECH-1	QMARK	CDF548	SEE PLAN	CEILING	4	208	1	60	19.2	27 LBS	1,2
ECH-2	QMARK	CDF548	SEE PLAN	CEILING	2	208	1	60	9.6	27 LBS	1,3
ECH-3	QMARK	CDF548	SEE PLAN	CEILING	2	208	1	60	9.6	27 LBS	1,3
ECH-4	QMARK	CDF548	SEE PLAN	CEILING	2	208	1	60	9.6	27 LBS	1,3
ECH-5	QMARK	QCH1101F	SEE PLAN	CEILING	1	120	1	60	8.3	10 LBS	1,2

NOTES:

1. PROVIDE WITH UNIT MOUNTED DISCONNECT SWITCH, OVERLOAD PROTECTION WITH MANUAL RESET, AND MOUNTING BRACKETS.
2. PROVIDE WITH INTEGRAL THERMOSTAT.

FURNACE SCHEDULE

TAG	MANUFACTURER	MODEL	STAGE	INPUT CAPACITY	OUTPUT CAPACITY	TEMP. RISE (°F)	BLOWER FAN SECTION					FILTER		COMBUSTION FAN SECTION			ELECTRICAL					WEIGHT LBS	AFUE	REMARKS
							SUPPLY CFM	OA CFM	EXT. S.P. (in)	MIN. MOTOR HP	RPM	THICK (in)	DIM (in)	FLA	TYPE	RPM	VOLTS	PHASE	HZ	MCA	MOCP			
FR-1	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	200	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-2	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	240	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-3	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	260	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-4	TRANE	S8X2B080M4PSC	2	80	64	30-60	1200	170	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-5	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	180	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-6	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	210	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-7	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	220	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-8	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	210	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-9	TRANE	S8X2B080M4PSC	2	80	64	30-60	1200	150	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7
FR-10	TRANE	S8X2B080M4PSC	2	80	64	30-60	1500	250	0.7	0.75	1075	1	16"X25"	0.66	CENTRIGUGAL	3300/2600	120	1	60	12.0	15	137	80	1,2,3,4,5,6,7

NOTES:

1) PROVIDE DISCONNECT SWITCH REFER TO ELECTRICAL PLANS....
2) PROVIDE 7-DAY FULLY PROGRAMMABLE CONTROLLER IN THE CONFERENCE ROOM. PROVIDE WITH TEMPERATURE SENSORS IN EACH CLASSROOM SERVED. SENSORS TO PROVIDE TEMPERATURE AVERAGING FOR EACH ZONE SERVED.
3) PROVIDE MERV 4 FILTER AND VIBRATION ISOLATORS.
4) PROVIDE DRIP PAN, LEAK DETECTOR, AND CONDENSATE PUMP.
5) PROVIDE HORIZONTAL HANGING KIT AND FLUE VENTS COMBUSTION AIR INTAKE AS PER RECOMMENDED BY MANUFACTURER.
6) PROVIDE HIGH VELOCITY FURNISHED FILTER, PER RECOMMENDED BY MANUFACTURER. FILTERS TO BE NEW AT TURNOVER.
7) SPLIT SYSTEMS MUST BE HIGH EFFICIENCY TYPE.

BUILDING AIR BALANCE

UNIT	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
CU-1	1500	200	1300	-
CU-2	1500	240	1260	-
CU-3	1500	260	1240	-
CU-4	1200	170	1030	-
CU-5	1500	180	1320	-
CU-6	1500	210	1290	-
CU-7	1500	220	1280	-
CU-8	1500	210	1290	-
CU-9	1200	150	1050	-
CU-10	1500	250	1250	-
EF-1	-	-	-	1600
EF-2	-	-	-	100
TOTAL:	14400	2090	12310	1700
BUILDING PRESSURE:			390	POSITIVE

COOLING COILS SCHEDULE

TAG	ODU	MANUFACTURER	MODEL	MATCH FURNACE WIDTH	FACE AREA (SQ FT)	PRESSURE DROP (IN)	NO. OF ROWS	FINS PER IN.	REF. LINE SIZE		WEIGHT LBS	REMARKS
									GAS	LIQUID		
CC-1	CU-1	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-2	CU-2	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-3	CU-3	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-4	CU-4	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-5	CU-5	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-6	CU-6	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-7	CU-7	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-8	CU-8	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-9	CU-9	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2
CC-10	CU-10	TRANE	4TXCC006	17.5"	7.00	0.30	3	16	7/8	3/8	52	1,2

NOTES:

1. FIELD VERIFY OVERALL REFRIGERANT LINE LENGTH AND CONFIRM REFRIGERANT LINE SIZES AND LENGTHS WITH MANUFACTURER.
2. PROVIDE HORIZONTAL CONVERSION KIT.

AIR PURIFICATION SYSTEM

TAG	MANUFACTURER	MODEL	LOCATION	AREA SERVED	CFM	ELECTRICAL				WEIGHT LBS	REMARKS
						POWER (W)	VOLTS	PHASE	HZ		
AP-1,2,3,4,5,6,7,8,9,10	RGF ENVIRONMENTAL GROUP	MICROCON-600	RETURN DUCT	SEE PLAN	600	225	120	1	60	46	1,2,3,4,5,6,7

NOTES

1) UNIT SHALL BE INSTALLED IN PARALLEL WITH THE MAIN RETURN DUCT (FOR EACH UNIT) IN THE CEILING AS PER MANUFACTURER'S GUIDELINES.
2) UNIT SHALL BE EQUIPPED WITH FILTRATION SYSTEM AND REME-LED OR HALO-LED SYSTEM CAPABLE OF BIPOLAR IONIZATION TO REDUCE VENTILATION DEMAND OF SPACE SERVED.
3) PROVIDE ELECTRICAL OUTLET WITHIN 7 FEET OF THE UNIT AS PER MANUFACTURER GUIDELINES.
4) MAINTAIN MINIMUM 6 FEET BETWEEN THE UNIT INLET AND OUTLET.
5) INTERLOCK THE AP UNIT WITH THE GAS FURNACE.
6) INSTALL AS PER MANUFACTURERS INSTRUCTIONS.
7) ALL PRICING AND ORDERS MUST BE DONE THROUGH RGF. CONTACT ROM LAUREANO, RLAUREANO@RGF.COM; 561-318-4679

EXHAUST FAN SCHEDULE

TAG	FLOW RATE	STATIC PRESSURE	ELECTRIC DATA					WEIGHT	dBA	INTERLOCK	BASIS OF DESIGN		REMARKS
		EXTERNAL	FAN SPEED	MOTOR SIZE			V/HZ/PH				MANUFACTURER	MODEL	
	CFM	IN W.G.	RPM	FLA	MCA	MOP		LBS					
EF-1	1600	1.5	1636	13.0	16.2	25	115/60/1	95	66	TIME CLOCK	GREENHECK	SQ-140-VG	1,2,3,4
EF-2	100	0.6	894	0.3	0.4	15	115/60/1	16	42	24/7	GREENHECK	SP-LP0810W	2,3,4,5

NOTES:

1. FAN SHALL RUN DURING OPERATING HOURS OF THE BUILDING.
2. PROVIDE WITH DISCONNECT SWITCH.
3. PROVIDE VIBRATION ISOLATION.
4. PROVIDE GRAVITY BACK DRAFT DAMPER.
5. IT ROOM EXHAUST FAN SHALL RUN 24/7

AIR TERMINAL

TAG	MANUFACTURER	MODEL	TYPE	CFM RANGE	NECK SIZE	NOMINAL FACE SIZE	REMARKS	WEIGHT
CDS-1	TITUS	TMSA	SUPPLY DIFFUSER	0-100	6"Ø	12x12	1-3	12 LBS
	TITUS	TMSA	SUPPLY DIFFUSER	100-225	8"Ø	24x24	1-3	12 LBS
	TITUS	TMSA	SUPPLY DIFFUSER	225-400	10"Ø	24x24	1-3	12 LBS
RG-1	TITUS	350RL	RETURN GRILLE	0-550	12x12	24x24	1-3	10 LBS
	TITUS	350RL	RETURN GRILLE	0-1400	20x20	24x24	1-3	12 LBS
EG-1	TITUS	350RL	EXHAUST GRILLE	0-100	6x6	12x12	1-3	6 LBS
EG-2	TITUS	350RL	EXHAUST GRILLE	0-250	8x8	12x12	1-3	8 LBS

NOTES:

1. BORDER TYPE TO BE COMPATIBLE WITH CEILING TYPE.
2. COLOR AND FINISH TO BE REVIEWED AND APPROVED BY THE ARCHITECT.
3. PROVIDE VOLUME BRANCH DAMPER. WHERE LOCATED IN INACCESSIBLE AREAS, PROVIDE CABLE OPERATED DAMPER LOCATED IN THE BRANCH, OPERABLE THROUGH THE FACE OF THE DIFFUSER (KEY OPERATED).

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Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Af	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp Pz * Ra	Az * Ra Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Voz/Ez)
DAYCARE-5 & 2	Educational Facilities	Daycare (through age 4)	941.0	26.0	10.0	0.18	260	169	0.8	537
										OA required per VRP

Zone Height (feet)	9.0
Desired Outside Air (Voz) IAQP (CF	260
Supply Air (Vs) (CFM)	1,500
Return Air (Vr)	1300
Recirc. Flow Factor (R)	0.87
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant

Air Changes Per Hour	10.6
Outside Air Per VRP	537 CFM
Outside Air Per IAQ	200 CFM
Outside Air Savings	337 CFM
OA Summer Drybulb	92.3
OA Summer Wetbulb	74.6
Coil Leaving Air Drybulb (F	55.0
Coil Leaving Air Wetbulb (F	55.0
OA MBH Saved Summer*	22.6
OA Tons Saved Summer*	1.9

VRP OA CFM per person	20.6
IAQ OA CFM per person	7.7
Winter Heating Savings	
OA Winter Design DB (F)	3
Supply Air DB Setpoint (F)	92
MBH Saved Winter	32.0
KW Saved Winter	9.5

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	2.25E-09	4.13E-09	Yes	1.29E-08	50%	OSHA
Acetone	250.0	8.05E-09	5.56E-09	Yes	1.29E-07	50%	NIOSH
Ammonia	25.00	1.84E-07	1.29E-07	Yes	1.46E-07	50%	OSHA
Benzene	1.0	9.3415E-09	6.2525E-09	Yes	1.46026E-07	50%	OSHA
2- Butanone (MEK)	200.0	1.87E-07	1.29E-07	Yes	2.92052E-06	50%	NIOSH
Carbon dioxide**	5000	4.6451E-05	4.9071E-05	Yes	2.49922E-05	0%	NIOSH
Chloroform	2.0	1.6619E-08	1.1649E-08	Yes	2.73422E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	1.72972E-06	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.00000E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.00000E+00	0%	NA
Methanol	200.0	7.2757E-09	2.0520E-08	Yes	1.1163E-07	0%	NIOSH
Methylene Chloride	25.0	5.2329E-07	4.0983E-07	Yes	8.0262E-06	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.00000E+00	0%	NOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.00000E+00	50%	OSHA
Tetrachloroethylene	100.0	5.9620E-07	4.6537E-07	Yes	9.1140E-06	50%	OSHA
Toluene	100.0	2.7356E-09	1.1378E-09	Yes	2.2806E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	2.4975E-05	1.9565E-05	Yes	3.8318E-04	50%	OSHA
Xylene	100.0	8.2453E-10	8.6754E-11	Yes	0.0000E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete

Is IAQ acceptable at reduced outside air levels?
Yes

All yellow shaded boxes require user input or review

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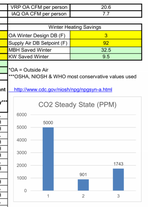
Date	23-08-2024
Job Name	LIGHTBRIDGE ACADEMY
Representative	-
Engineer	NY Engineers
Contractor	-

IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2
Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2



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Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Af	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp Pz * Ra	Az * Ra Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Voz/Ez)
DAYCARE-3 & 4	Educational Facilities	Daycare (through age 4)	1,048.0	32.0	10.0	0.18	320	186	0.8	635
										OA required per VRP

Zone Height (feet)	9.0
Desired Outside Air (Voz) IAQP (CF	260
Supply Air (Vs) (CFM)	1,500
Return Air (Vr)	1240
Recirc. Flow Factor (R)	0.83
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant

Air Changes Per Hour	9.0
Outside Air Per VRP	635 CFM
Outside Air Per IAQ	260 CFM
Outside Air Savings	375 CFM
OA Summer Drybulb	92.3
OA Summer Wetbulb	74.6
Coil Leaving Air Drybulb (F	55.0
Coil Leaving Air Wetbulb (F	55.0
OA MBH Saved Summer*	28.5
OA Tons Saved Summer*	2.4

VRP OA CFM per person	19.9
IAQ OA CFM per person	7.5
Winter Heating Savings	
OA Winter Design DB (F)	3
Supply Air DB Setpoint (F)	92
MBH Saved Winter	38.2
KW Saved Winter	11.2

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
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Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	2.0814E-09	8.4585E-10	Yes	1.2903E-08	50%	OSHA
Acetone	250.0	8.3675E-09	6.7890E-09	Yes	1.29903E-07	50%	NIOSH
Ammonia	25.00	1.9223E-07	1.5873E-07	Yes	3.05025E-06	50%	OSHA
Benzene	1.0	9.6927E-09	7.6713E-09	Yes	1.46022E-07	50%	OSHA
2- Butanone (MEK)	200.0	1.5654E-07	4.5966E-07	Yes	8.83965E-06	50%	NIOSH
Carbon dioxide**	5000	4.6515E-05	4.9071E-05	Yes	2.49922E-05	0%	NIOSH
Chloroform	2.0	1.7279E-08	1.4228E-08	Yes	2.73422E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.00000E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.00000E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.00000E+00	0%	NA
Methanol	200.0	7.4161E-09	1.9933E-08	Yes	1.1163E-07	0%	NIOSH
Methylene Chloride	25.0	5.3338E-07	3.9362E-07	Yes	8.0262E-06	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.00000E+00	0%	NOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.00000E+00	50%	OSHA
Tetrachloroethylene	100.0	5.5782E-07	3.7438E-07	Yes	9.1140E-06	50%	OSHA
Toluene	100.0	2.6445E-09	1.0845E-09	Yes	2.2806E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	2.3446E-05	1.5739E-05	Yes	3.8318E-04	50%	OSHA
Xylene	100.0	8.2453E-10	7.3880E-11	Yes	0.0000E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete

Is IAQ acceptable at reduced outside air levels?
Yes

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Representative	-
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Contractor	-

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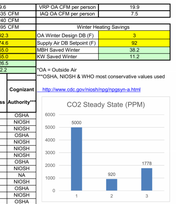

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Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Af	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp Pz * Ra	Az * Ra Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Voz/Ez)
DAYCARE-1 & 6	Educational Facilities	Daycare (through age 4)	1,161.0	36.0	10.0	0.18	360	214	0.8	718
										OA required per VRP

Zone Height (feet)	9.0
Desired Outside Air (Voz) IAQP (CF	260
Supply Air (Vs) (CFM)	1,500
Return Air (Vr)	1240
Recirc. Flow Factor (R)	0.83
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant

Air Changes Per Hour	8.6
Outside Air Per VRP	718 CFM
Outside Air Per IAQ	260 CFM
Outside Air Savings	458 CFM
OA Summer Drybulb	92.3
OA Summer Wetbulb	74.6
Coil Leaving Air Drybulb (F	55.0
Coil Leaving Air Wetbulb (F	55.0
OA MBH Saved Summer*	30.7
OA Tons Saved Summer*	2.6

VRP OA CFM per person	19.9
IAQ OA CFM per person	7.2
Winter Heating Savings	
OA Winter Design DB (F)	3
Supply Air DB Setpoint (F)	92
MBH Saved Winter	44.2
KW Saved Winter	13.0

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
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Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	2.0578E-09	2.5535E-09	Yes	1.29E-08	50%	OSHA
Acetone	250.0	8.3195E-09	8.4633E-09	Yes	1.29E-07	50%	NIOSH
Ammonia	25.00	1.9116E-07	1.9445E-07	Yes	1.46E-07	50%	OSHA
Benzene	1.0	9.6403E-09	7.2291E-09	Yes	1.46E-07	50%	OSHA
2- Butanone (MEK)	200.0	5.6305E-07	4.3345E-07	Yes	8.83E-06	50%	NIOSH
Carbon dioxide**	5000	4.6529E-05	4.9305E-05	Yes	2.49E-05	0%	NIOSH
Chloroform	2.0	1.7417E-08	1.3413E-08	Yes	2.73E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.00E+00	0%	NA
Methanol	200.0	7.1100E-09	1.9833E-08	Yes	1.11E-07	0%	NIOSH
Methylene Chloride	25.0	5.1137E-07	3.9362E-07	Yes	8.02E-06	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.00E+00	0%	NOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Tetrachloroethylene	100.0	5.5067E-07	4.4996E-07	Yes	9.11E-06	50%	OSHA
Toluene	100.0	2.7016E-09	1.2698E-09	Yes	2.28E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	2.3956E-05	1.8758E-05	Yes	3.83E-04	50%	OSHA
Xylene	100.0	8.2453E-10	8.5735E-11	Yes	0.00E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete

Is IAQ acceptable at reduced outside air levels?
Yes

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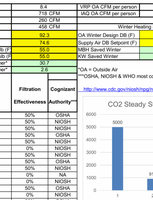

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Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Af	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp Pz * Ra	Az * Ra Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Voz/Ez)
DAYCARE-7	Educational Facilities	Daycare (through age 4)	742.0	25.0	10.0	0.18	250	134	0.8	479
										OA required per VRP

Zone Height (feet)	9.0
Desired Outside Air (Voz) IAQP (CF	170
Supply Air (Vs) (CFM)	1,200
Return Air (Vr)	1030
Recirc. Flow Factor (R)	0.86
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant

Air Changes Per Hour	10.8
Outside Air Per VRP	479 CFM
Outside Air Per IAQ	170 CFM
Outside Air Savings	309 CFM
OA Summer Drybulb	92.3
OA Summer Wetbulb	74.6
Coil Leaving Air Drybulb (F	55.0
Coil Leaving Air Wetbulb (F	55.0
OA MBH Saved Summer*	20.7
OA Tons Saved Summer*	1.7

VRP OA CFM per person	19.2
IAQ OA CFM per person	6.8
Winter Heating Savings	
OA Winter Design DB (F)	3
Supply Air DB Setpoint (F)	92
MBH Saved Winter	29.3
KW Saved Winter	8.8

*OA = Outside Air
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Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	2.2965E-09	8.3229E-10	Yes	1.29E-08	50%	OSHA
Acetone	250.0	8.5556E-09	6.3987E-09	Yes	1.29E-07	50%	NIOSH
Ammonia	25.00	1.8469E-07	1.4441E-07	Yes	3.05E-06	50%	OSHA
Benzene	1.0	9.9415E-09	7.2196E-09	Yes	1.46E-07	50%	OSHA
2- Butanone (MEK)	200.0	5.4758E-07	4.3266E-07	Yes	8.83E-06	50%	NIOSH
Carbon dioxide**	5000	4.6485E-05	4.9155E-05	Yes	2.49E-05	0%	NIOSH
Chloroform	2.0	1.6892E-08	1.3392E-08	Yes	2.73E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.00E+00	0%	NA
Methanol	200.0	6.9917E-09	1.9023E-08	Yes	1.11E-07	0%	NIOSH
Methylene Chloride	25.0	4.9713E-07	3.9286E-07	Yes	8.02E-06	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.00E+00	0%	NOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Tetrachloroethylene	100.0	5.6435E-07	4.4815E-07	Yes	9.11E-06	50%	OSHA
Toluene	100.0	2.8661E-09	1.3902E-09	Yes	2.28E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	2.3732E-05	1.8736E-05	Yes	3.83E-04	50%	OSHA
Xylene	100.0	8.2453E-10	9.3669E-11	Yes	0.0000E+00	50%	OSHA

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Is IAQ acceptable at reduced outside air levels?
Yes

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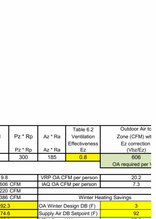

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Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Af	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp Pz * Ra	Az * Ra Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Voz/Ez)
DAYCARE-8	Educational Facilities	Daycare (through age 4)	881.0	25.0	10.0	0.18	250	159	0.8	511
										OA required per VRP

Zone Height (feet)	9.0
Desired Outside Air (Voz) IAQP (CF	180
Supply Air (Vs) (CFM)	1,000
Return Air (Vr)	1290
Recirc. Flow Factor (R)	0.88
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant

Air Changes Per Hour	11.6
Outside Air Per VRP	511 CFM
Outside Air Per IAQ	180 CFM
Outside Air Savings	331 CFM
OA Summer Drybulb	92.3
OA Summer Wetbulb	74.6
Coil Leaving Air Drybulb (F	55.0
Coil Leaving Air Wetbulb (F	55.0
OA MBH Saved Summer*	22.0
OA Tons Saved Summer*	1.8

VRP OA CFM per person	20.4
IAQ OA CFM per person	7.2
Winter Heating Savings	
OA Winter Design DB (F)	3
Supply Air DB Setpoint (F)	92
MBH Saved Winter	31.9
KW Saved Winter	9.4

*OA = Outside Air
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Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	2.1063E-09	6.2423E-10	Yes	1.29E-08	50%	OSHA
Acetone	250.0	8.8196E-09	6.3974E-09	Yes	1.29E-07	50%	NIOSH
Ammonia	25.00	2.0260E-07	1.4265E-07	Yes	3.05E-06	50%	OSHA
Benzene	1.0	1.0201E-08	7.2238E-09	Yes	1.46E-07	50%	OSHA
2- Butanone (MEK)	200.0	5.7744E-07	4.3305E-07	Yes	8.84E-06	50%	NIOSH
Carbon dioxide**	5000	4.6598E-05	4.9365E-05	Yes	2.49E-05	0%	NIOSH
Chloroform	2.0	1.8227E-08	1.3417E-08	Yes	2.73E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.00E+00	0%	NA
Methanol	200.0	7.4161E-09	1.9933E-08	Yes	1.11E-07	0%	NIOSH
Methylene Chloride	25.0	5.3338E-07	3.9362E-07	Yes	8.02E-06	50%	OSHA
Propane	1000.0	1.1242E-09	1.1242E-09	Yes	0.00E+00	0%	NOSH
Tetrachloroethane	5.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Tetrachloroethylene	100.0	6.0566E-07	4.4696E-07	Yes	9.11E-06	50%	OSHA
Toluene	100.0	2.7642E-09	1.2898E-09	Yes	2.28E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	2.5457E-05	1.8791E-05	Yes	3.83E-04	50%	OSHA
Xylene	100.0	8.2453E-10	8.5753E-11	Yes	0.0000E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete

Is IAQ acceptable at reduced outside air levels?
Yes

All yellow shaded boxes require user input or review

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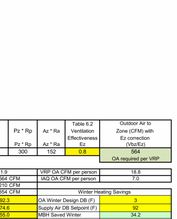
The University of Denmark conducted a study to confirm CO2 levels at 5,000 PPM had no impact on cognitive function. Zhang K, Wargocki P, Lian Z, Human Responses to Carbon Dioxide, a Follow-up Study at Recommended Exposure Limits in

Date	23-08-2024
Job Name	LIGHTBRIDGE ACADEMY
Representative	-
Engineer	NY Engineers
Contractor	-

IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2
Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2



1 = NIOSH CO2 Limit
2 = CO2 Level at Ventilation Rate OA Flow Rate
3 = CO2 Level at IAQ Procedure OA Flow Rate

GPS Air
3101 Yorkmont Rd
Suite 400
Charlotte, NC 28208
www.gpsair.com
VERSION 2.2 running ASHRAE 62.1-2019

Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Af	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 cfm/ft2 Ra	Pz * Rp Pz * Ra	Az * Ra Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Voz/Ez)
DAYCARE-11	Educational Facilities	Daycare (through age 4)	842.0	30.0	10.0	0.18	300	152	0.8	564
										OA required per VRP

Zone Height (feet)	9.0
Desired Outside Air (Voz) IAQP (CF	170
Supply Air (Vs) (CFM)	1,000
Return Air (Vr)	1290
Recirc. Flow Factor (R)	0.86
Ventilation Effectiveness (Ez)	0.8
Level of Physical Activity	**Sedentary**
Filter Location	B
HVAC Flow Type	Constant
Outdoor Air Flow Type	Constant

Air Changes Per Hour	11.9
Outside Air Per VRP	564 CFM
Outside Air Per IAQ	210 CFM
Outside Air Savings	354 CFM
OA Summer Drybulb	92.3
OA Summer Wetbulb	74.6
Coil Leaving Air Drybulb (F	55.0
Coil Leaving Air Wetbulb (F	55.0
OA MBH Saved Summer*	23.7
OA Tons Saved Summer*	2.0

VRP OA CFM per person	18.8
IAQ OA CFM per person	7.0
Winter Heating Savings	
OA Winter Design DB (F)	3
Supply Air DB Setpoint (F)	92
MBH Saved Winter	34.2
KW Saved Winter	10.0

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	2.1063E-09	6.3047E-10	Yes	1.29E-08	50%	OSHA
Acetone	250.0	8.8196E-09	6.4608E-09	Yes	1.29E-07	50%	NIOSH
Ammonia	25.00	2.0260E-07	1.4405E-07	Yes	3.05E-06	50%	OSHA
Benzene	1.0	1.0201E-08	7.2238E-09	Yes	1.46E-07	50%	OSHA
2- Butanone (MEK)	200.0	5.7744E-07	4.3305E-07	Yes	8.84E-06	50%	NIOSH
Carbon dioxide**	5000	4.6598E-05	4.9365E-05	Yes	2.49E-05	0%	NIOSH
Chloroform	2.0	1.8227E-08	1.3417E-08	Yes	2.73E-07	50%	NIOSH
Dioxane	100.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.0000E+00	0.0000E+00	Yes	0.00E+00	50%	NIOSH
Methane	NA	6.8698E-08	6.8698E-08	Yes	0.00E+00	0

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VERSION 2.2 running ASHRAE 62.1-2019

Zone Tag	Facility Type	Zone Use	Zone Floor Area (square ft) Az	Zone Max Occupancy Pz	Table 6.1 OA per Occupant Rp	Table 6.1 clm/ft2 Ra	Pz * Rp	Az * Ra	Table 6.2 Ventilation Effectiveness Ez	Outdoor Air to Zone (CFM) with Ez correction (Vbz/Ez)
CC-10 : FR-10	Educational Facilities	Daycare (through age 4)	1,659.0	3.0	10.0	0.18	30	299	0.8	411
										OA required per VRP

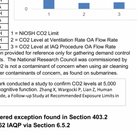
Zone Height (feet)	9.0		
Desired Outside Air Into IAQP (Cfm)	200		
Supply Air (Vs) (CFM)	1,500		
Return Air (Vr)	1250		
Recirc. Flow Factor (R)	0.83		
Ventilation Effectiveness (Ez)	0.8		
Level of Physical Activity	Sedentary		
Filter Location	B		
HVAC Flow Type	Constant		
Outdoor Air Flow Type	Constant		

Air Changes Per Hour	6.0	VRP OA CFM per person	136.9
Outside Air Per VRP	411 CFM	IAQ OA CFM per person	83.3
Outside Air Per IAQ	292 CFM		
Outside Air Savings	161 CFM	Winter Heating Savings	
OA Summer Drybulb	92.3	OA Winter Design DB (F)	3
OA Summer Wetbulb	74.6	Supply Air DB Setpoint (F)	92
Coil Leaving Air Drybulb (F	55.0	MBH Saved Winter	15.5
Coil Leaving Air Wetbulb (F	55.0	KW Saved Winter	4.5
OA MBH Saved Summer*	10.9		
OA Tons Saved Summer*	0.9		

Indoor Contaminants Generated By People & From Outdoors	Maximum Threshold Value Based on OSHA or NIOSH (PPM)	Steady State (lb/ft3) Using the VRP* (Prescribed OA) Ionization Off	Steady State (lb/ft3) Using the IAQ Method (Reduced OA) Ionization On	Is Steady State Level Acceptable at Reduced OA Levels?	Contaminant Generation Rate lb/person/min	Filtration Effectiveness	Cognizant Authority**
Acetaldehyde	100.0	1.366E-09	2.653E-10	Yes	1.290E-06	50%	OSHA
Acetone	250.0	1.373E-09	6.624E-10	Yes	1.296E-07	50%	NIOSH
Ammonia	25.00	2.793E-08	1.486?E-08	Yes	3.052E-06	50%	NIOSH
Benzene	1.0	1.832?E-09	7.913?E-10	Yes	1.480E-07	50%	OSHA
2- Butanone (MEK)	200.0	8.071E-08	4.300E-08	Yes	8.836E-06	50%	NIOSH
Carbon Dioxide**	5000	4.518?E-05	4.532E-05	Yes	2.489E-05	0%	NIOSH
Chloroform	2.0	2.556?E-09	1.340?E-09	Yes	2.734?E-07	50%	NIOSH
Dioxane	100.0	0.000?E+00	0.000?E+00	Yes	0.000?E+00	50%	OSHA
Hydrogen Sulfide	10.0	0.000?E+00	0.000?E+00	Yes	0.000?E+00	50%	NIOSH
Methane	NA	6.869?E-09	6.869?E-09	Yes	0.000?E+00	0%	NA
Methanol	200.0	1.019?E-09	1.674?E-09	Yes	1.116?E-07	0%	NIOSH
Methylene Chloride	25.0	7.342?E-08	3.907?E-08	Yes	8.026?E-06	50%	OSHA
Propane	1000.0	1.124?E-09	1.124?E-09	Yes	0.000?E+00	0%	NIOSH
Tetrachloroethane	5.0	0.000?E+00	0.000?E+00	Yes	0.000?E+00	50%	OSHA
Tetrachloroethylene	100.0	8.339?E-08	4.436?E-08	Yes	9.114?E-06	50%	OSHA
Toluene	100.0	1.483?E-08	3.150?E-10	Yes	1.285?E-08	50%	NIOSH
1,1,1 - Trichloroethane	350.0	3.496?E-08	1.864?E-08	Yes	3.823?E-06	50%	NIOSH
Xylene	100.0	6.243?E-10	1.012?E-10	Yes	0.000?E+00	50%	OSHA

Building materials and furnishings assumed to have no VOCs and off-gassing is complete
All yellow shaded boxes require user input or review

Is IAQ acceptable at reduced outside air levels? Yes



1 = NIOSH CO2 Limit
2 = CO2 Level at Ventilation Rate OA Flow Rate
3 = CO2 Level at IAQ Procedure OA Flow Rate

*Carbon dioxide has been provided for reference only for gathering demand control ventilation (DCV) setpoints. The National Research Council was commissioned by the US Navy to prove CO2 is not a contaminant of concern when using air cleaning devices to control the other contaminants of concern, as found on submarines.

The University of Denmark conducted a study to confirm CO2 levels at 5,000 PPM had no impact on cognitive function. Zhang X, Wargocki P, Lian Z. Human Responses to Carbon Dioxide, a Follow-up Study at Recommended Exposure Limits in

IMC 2006 & later allows for ASHRAE 62 IAQP through the engineered exception found in Section 403.2
Exhaust flow rates may differ from Table 6.5 based on ASHRAE 62 IAQP via Section 6.5.2

Date	
Job Name	LIGHTBRIDGE ACADEMY
Representative	-
Engineer	NY Engineers
Contractor	-

*OA = Outside Air
**OSHA, NIOSH & WHO most conservative values used
http://www.cdc.gov/niosh/npg/npgsyn-a.html

VENTILATION CALCULATION (ASHARE 62.1-2019/2024 OHIO MECHANICAL CODE)

SR. NO	ROOM TAG	AREA (Az)	OCCUPANCY /1000SQ.FT.	OCCUPANY AS PER CODE	FINAL OCCUPANCY AS PER PLAN (Pz)	CFM/SQ.FT (Ra)	CFM/PERSON (Rp)	OUTSIDE AIR CFM (Vbz)	VENTILATION EFFECTIVNESS (Ez=0.8)	ZONE OUTDOOR AIRFLOW CFM (Vaz')	AFTER IAQ ZONE OUTDOOR AIRFLOW CFM (Vaz)	(Vaz)	(Vpz)	PRIMARY OUTDOOR AIR FRACTION (Zp=Vaz/Vpz)	SYSTEM VENTILATION EFFICIENCY AS PER 2024 OMC 403.3.1.1.2.3.2 (Ev)	SELECTED EXHAUST CFM
1	DAYCARE 1	512	25	13	12	0.18	10	213	0.8	267	90					100
2	DAYCARE 2	435	25	11	14	0.18	10	219	0.8	274	95	200	1500	0.13	1	100
3	INFANT PANTRY	124	20	3	2	0.12	7.5	30	0.8	38	15					0
4	DAYCARE 3	523	25	14	16	0.18	10	255	0.8	319	120					100
5	DAYCARE 4	523	25	14	16	0.18	10	255	0.8	319	120	240	1500	0.16	0.99	100
6	DAYCARE 5	595	25	15	18	0.18	10	288	0.8	360	130					100
7	DAYCARE 6	596	25	15	18	0.18	10	288	0.8	360	130	260	1500	0.17	0.98	100
8	DAYCARE 7	742	25	19	25	0.18	10	384	0.8	480	170	170	1200	0.14	1	0
9	DAYCARE 8	881	25	23	25	0.18	10	409	0.8	512	180	180	1500	0.12	1	0
10	DAYCARE 9	950	25	24	30	0.18	10	471	0.8	589	210	210	1500	0.14	0.99	0
11	DAYCARE 10	1025	25	26	30	0.18	10	485	0.8	607	220	220	1500	0.15	0.98	0
12	DAYCARE 11	842	25	22	30	0.18	10	452	0.8	565	210	210	1500	0.14	1	0
13	VESTIBULE	98	0	0	0	0.06	0	6	0.8	8	10					0
14	OFFICE	207	5	2	2	0.06	5	23	0.8	29	30					0
15	CONF. ROOM	181	50	10	4	0.06	5	31	0.8	39	30					0
16	IT/STORAGE	77	0	0	0	0.12	5	10	0.8	13	10	150	1200	0.13	1.00	100
17	CORRIDOR 1A	632	0	0	0	0.06	0	38	0.8	48	50					0
18	UTILITY RM	77	5	1	0	0.06	5	5	0.8	7	10					50
19	FIRE	64	0	0	0	0.12	0	8	0.8	10	10					0
20	CORRIDOR 1B	642	0	0	0	0.06	0	39	0.8	49	180					0
21	STAFF LOUNGE	222	5	2	1	0.06	5	19	0.8	24	25					0
22	TOY STORE	59	0	0	0	0.12	5	8	0.8	10	10					0
23	LAUNDRY	95	0	0	0	0.12	0	12	0.8	15	15	250	1500	0.17	0.98	0
24	BUGGY	56	5	1	0	0.06	5	4	0.8	5	10					0
25	BONDING RM	63	5	1	0	0.06	5	4	0.8	5	10					0
26	TOILETS	678	0	0	0	0	0	0	0.8	0	0	0	0	0	0	950
	TOTAL	**10899**	-	-	**243**	-	-	**3956**	-	**4952**	**2090**	-	-	-	-	**1700**

NOTE:
1. REDUCED VENTILATION RATES ARE PROVIDED BASED ON EXCEPTION 1 OF SECTION 403.2 OF 2024 OMC USING ENGINEERED VENTILATION SYSTEM COMPRISES OF IONIZATION FILTRATION.

NY ENGINEERS
NEARBY ENGINEERS
382 NE 191ST STREET SUITE 49674,
MIAMI, FL 33179
PH-914.257.3455
WWW.NY-ENGINEERS.COM

Lightbridge Academy SM
Innovators in Educational Child Care

ALTERATION OF:

LIGHTBRIDGE ACADEMY

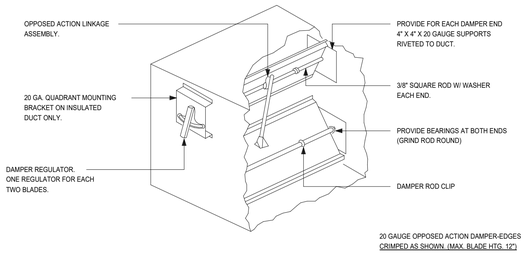
SHEET TITLE:

MECHANICAL VENTILATION SCHEDULE (2 OF 2)

REV.	DATE	REMARKS
1	11/12/2024	BLDG. DEPT. RESPONSES
	09/10/2024	ISSUED FOR PERMIT

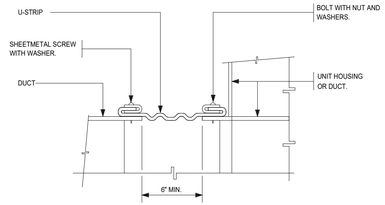
JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: Author
CHECKED BY: Checker

SHEET NO.
M302

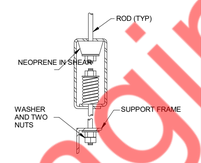


NOTE: 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

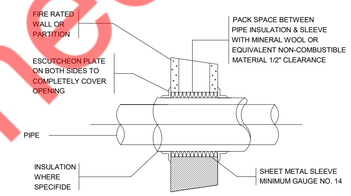
1 / M301 LOW PRESSURE BALANCING DAMPER
N.T.S



2 / M301 FLEXIBLE CONNECTION (DUCT-EQUIPMENT)
N.T.S

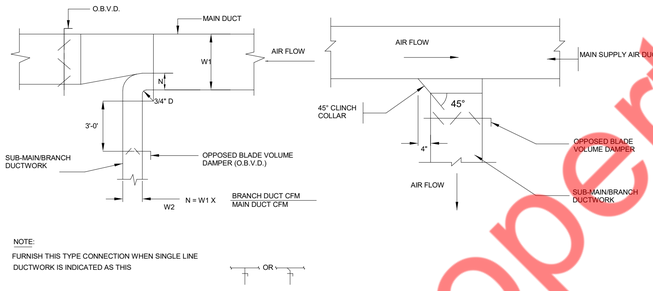


3 / M301 VIBRATION ISOLATOR DETAIL
N.T.S



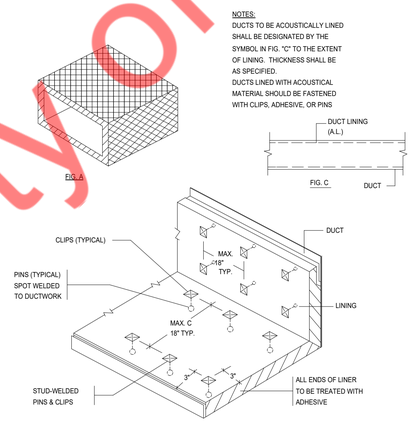
NOTE:
1.) THE INSTALLATION OF FIRE STOPPING MATERIALS SHALL BE SUBJECT TO CONTROLLED INSPECTION IN ACCORDANCE WITH C26-106.3.

4 / M301 PIPE SLEEVE THRU RATED WALL
N.T.S

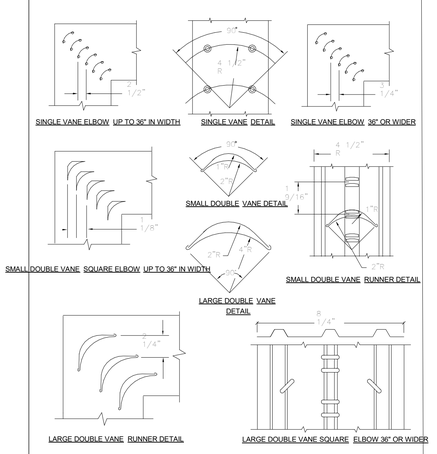


NOTE:
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE DUCTWORK IS INDICATED AS THIS

5 / M301 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
N.T.S



6 / M301 ACOUSTICAL TREATMENT DUCT LINING
N.T.S



7 / M301 LOW VELOCITY DUCTWORK ELBOWS
N.T.S

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382 NE 191ST STREET SUITE 49674,
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WWW.NY-ENGINEERS.COM

Lightbridge Academy℠
Innovators in Educational Child Care

ALTERATION OF:

LIGHTBRIDGE ACADEMY

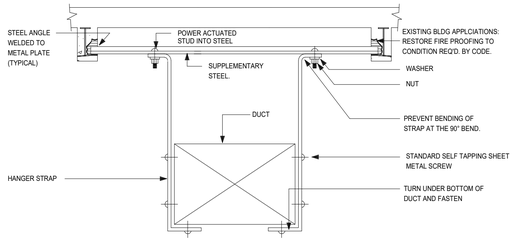
SHEET TITLE:

MECHANICAL DETAILS (1 OF 3)

REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

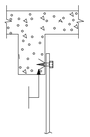
JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
M401

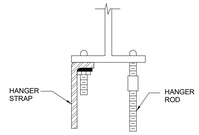


NOTES:

1. DUCTS SHALL NOT BE HUNG FROM OR SUPPORTED BY HUNG CEILING.
2. FOR ALL DUCTS, HANGERS SHALL BE TURNED UNDER AND FASTENED TO TO THE BOTTOM OF DUCT AS SHOWN ABOVE.
3. FRICTION OR CADDY CLIP ATTACHMENT TO STRUCTURE IS NOT PERMITTED.

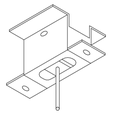


B.S.A. # 469-74-SM EXPANSION BOLT

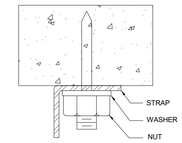


POWER ACTUATED STUDS INTO STEEL (STRUCTURE OR DECK)

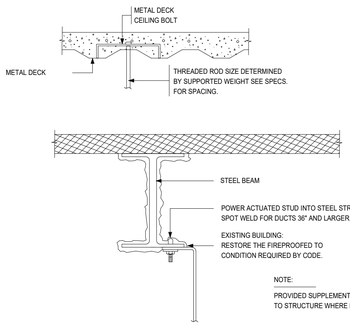
DUCT HANGER SCHEDULE		
DUCT CROSS SECTIONAL AREA	STRAP HANGER SIZE	MAX. SPACING
UNDER 2 SQ FT.	1" X 1/16"	6'-0" O.C.
2 TO 4 SQ FT.	1" X 1/8"	8'-0" O.C.
4 TO 8 SQ FT.	1" X 1/8"	6'-0" O.C.
OVER 8 SQ FT.	1" X 1/8"	4'-0" O.C.

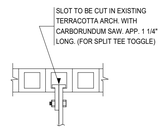


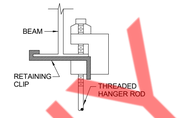
MANUFACTURED CONCRETE INSERT



FLAT BAR CONCRETE INSERT

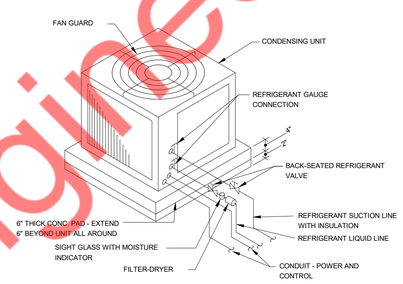






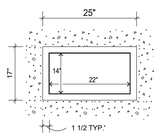
"C" CLAMP W/LOCK NUT

1 M302 DUCT HANGING DETAILS N.T.S



2 M302 CONDENSING UNIT MOUNTED ON GRADE N.T.S

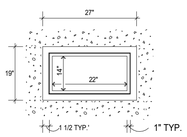
UNLINED DUCT



22X14 DUCT (SHEETMETAL)
25X17 SLAB OPENING

- SLAB OPENING = DUCT DIMENSION + 3"
- IF SPACE IS LIMITED, CAN BE DUCT DIMENSION + 1" IF INSULATION IS NOT REQUIRED (CHECK WITH ENGINEER)

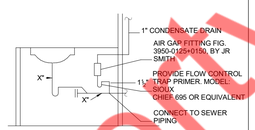
LINED DUCT



22X14 REQUIRED FREE AIRFLOW
24X16 DUCT (SHEETMETAL)
27X19 SLAB OPENING

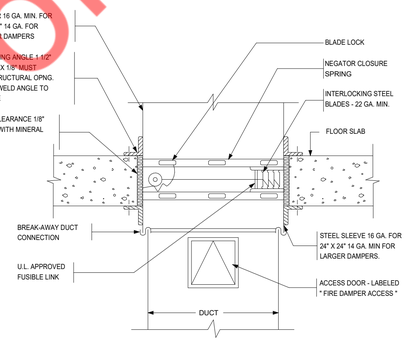
- SLAB OPENING = FREE AIRFLOW DIMENSION + 5"
- IF SPACE IS LIMITED, CAN BE FREE AIRFLOW DIMENSION + 3"

3 M302 DUCT SIZE/SLAB OPENING CONVENTION N.T.S

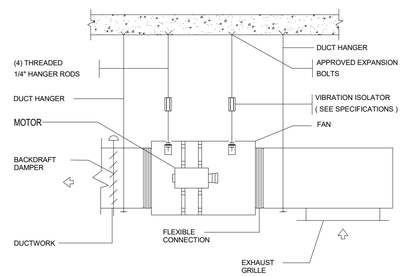


NOTE:
LOCATE AIR GAP FITTING AND PIPING WITHIN SINK/LAVATORY ENCLOSURE

4 M302 AIR GAP FITTING DETAIL N.T.S



5 M302 HORIZONTAL FIRE DAMPER DETAIL N.T.S



6 M302 INLINE FAN HANGING SUPPORT DETAIL N.T.S

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Lightbridge Academy SM
Innovators in Educational Child Care

ALTERATION OF:

LIGHTBRIDGE ACADEMY

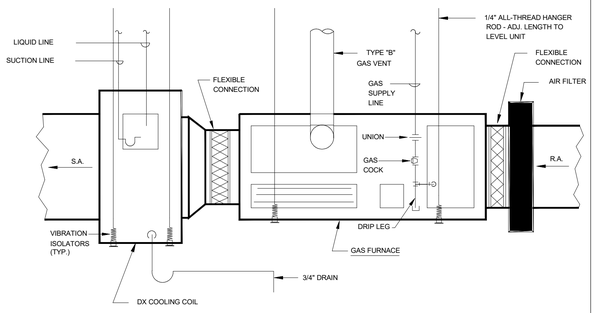
SHEET TITLE:

MECHANICAL DETAILS (2 OF 3)

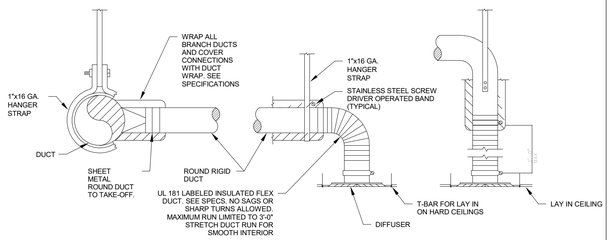
REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	Author
CHECKED BY:	Checker

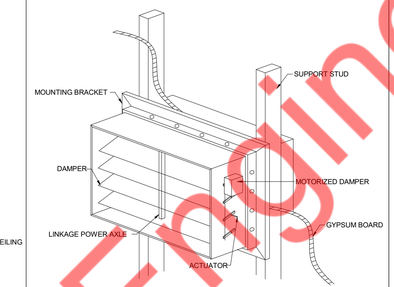
SHEET NO.
M402



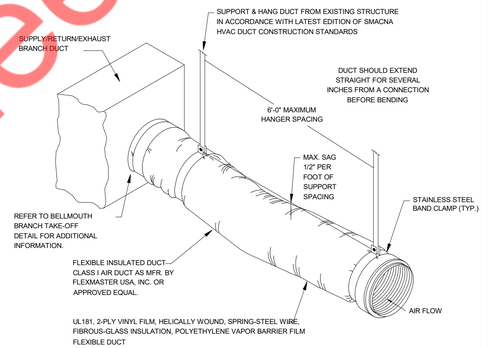
1 M303 HORIZONTAL FURNACE WITH COOLING COIL DETAIL N.T.S



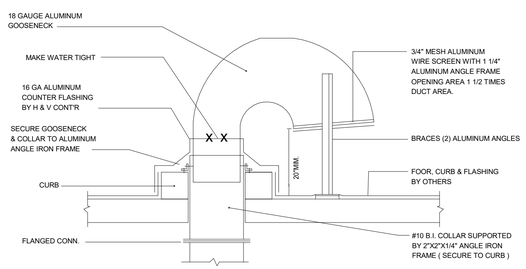
2 M303 TYPICAL DIFFUSER CONNECTION DETAIL N.T.S



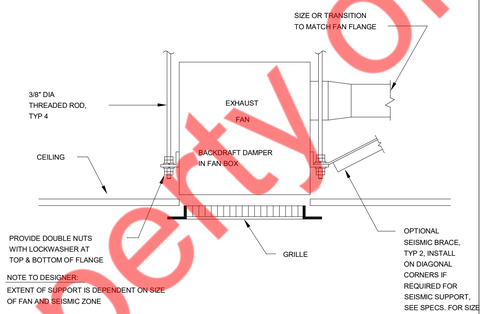
3 M303 MOTORIZED DAMPER DETAIL N.T.S



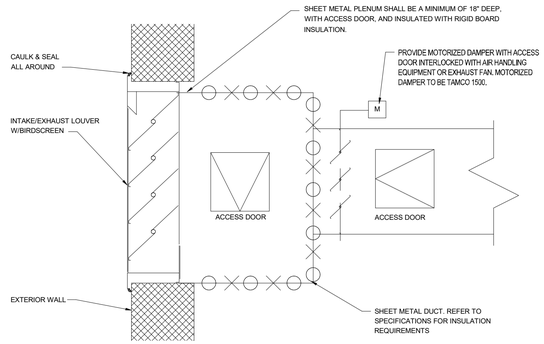
4 M303 FLEXIBLE DUCT SUPPORT DETAIL N.T.S



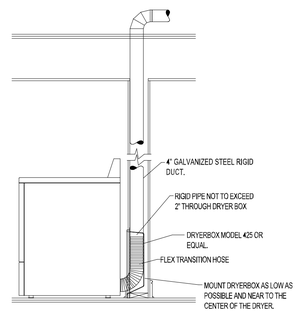
5 M303 TYPICAL DETAIL OF ROOF GOOSENECK N.T.S



6 M303 CEILING EXHAUST FAN N.T.S



7 M303 LOUVER DETAIL N.T.S



8 M303 CLOTHES DRYER BOX DETAIL N.T.S

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382 NE 191ST STREET SUITE 49674,
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PH-914.257.3455
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Lightbridge Academy℠
Innovators in Educational Child Care

ALTERATION OF:

LIGHTBRIDGE ACADEMY

SHEET TITLE:

MECHANICAL DETAILS (3 OF 3)

REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	Author
CHECKED BY:	Checker

SHEET NO.
M403

ELECTRICAL DRAWING / REVISION LOG

		DATE:	ISSUE:			
●	NEW OR REVISED ISSUE					
○	NON REVISED ISSUE					
NUMBER	NAME		●			
E-001	ELECTRICAL COVER SHEET		●			
E-002	ELECTRICAL GENERAL NOTES		●			
E-003	ELECTRICAL POWER AND LIGHTING NOTES		●			
E-101	ELECTRICAL POWER PLAN		●			
E-201	ELECTRICAL LIGHTING PLAN		●			
E-301	ELECTRICAL SPECIFICATIONS (1 OF 2)		●			
E-302	ELECTRICAL SPECIFICATIONS (2 OF 2)		●			
E-401	ELECTRICAL DETAILS (1 OF 4)		●			
E-402	ELECTRICAL DETAILS (2 OF 4)		●			
E-403	ELECTRICAL DETAILS (3 OF 4)		●			
E-404	ELECTRICAL DETAILS (4 OF 4)		●			
E-501	ELECTRICAL RISER DIAGRAM		●			
E-601	ELECTRICAL PANEL SCHEDULES		●			

ELECTRICAL SYMBOLS LEGEND

J	JUNCTION BOX
S	SINGLE POLE, 120/277V LIGHT SWITCH: COMMERCIAL GRADE 'A' REPRESENTS CONTROL DESIGNATION.
S3	SINGLE POLE, 120/277V 3-WAY LIGHT SWITCH: COMMERCIAL GRADE 'a' REPRESENTS CONTROL DESIGNATION.
OS	OCCUPANCY (AUTO ON/AUTO OFF) SENSOR SWITCH. WATTSTOPPER #DW-100. (VS INDICATES VACANCY MODE (MANUAL ON/AUTO OFF))
OS	OCCUPANCY (AUTO ON/AUTO OFF) SENSOR DIMMER SWITCH. WATTSTOPPER #PW-311 (VS INDICATES VACANCY MODE (MANUAL ON/AUTO OFF))
D	SINGLE POLE, 120/277V DIMMER SWITCH: COMMERCIAL GRADE 'a' REPRESENTS CONTROL DESIGNATION.
VS	CEILING MTD. VACANCY SENSOR. WATTSTOPPER #DT-300 W/ BZ-150 POWERPACK. 'a' REPRESENTS CONTROL DESIGN. (MANUAL ON/AUTO OFF).
OS	CEILING MTD. OCCUPANCY SENSOR. WATTSTOPPER #UT-300 SERIES W/ BZ-150 POWERPACK. 'a' REPRESENTS CONTROL DESIGN.
	120V 20A DUPLEX RECEPTACLE COMMERCIAL GRADE.
	120V 20A GFI DUPLEX RECEPTACLE COMMERCIAL GRADE. MOUNTED @ 42" A.F.F. (U.O.N.)
	120V 20A QUAD RECEPTACLE COMMERCIAL GRADE.
	120V 20A CEILING MTD. DUPLEX RECEPTACLE COMMERCIAL GRADE.
TH A	THERMAL DISCONNECT SWITCH. SIZE AS REQUIRED.
FU A/B/C	UNFUSED DISCONNECT SWITCH. 'A'=NEMA RATING, 'B'=SWITCH RATING, 'C'=NUMBER OF POLES.
F A/B/C/D	FUSED DISCONNECT SWITCH. 'A'=NEMA RATING, 'B'=SWITCH RATING, 'C'=FUSE SIZE, 'D'= NUMBER OF POLES.
XXXXX	SURFACE MOUNTED ELECTRICAL PANELBOARD.
	TELEPHONE OUTLET. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE CEILING.
	DATA OUTLET. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE CEILING.
	COMBINATION TELEPHONE/DATA OUTLET. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE CEILING.
P	P.A. SYSTEM/MUSIC SPEAKER. EC TO PROVIDE 4X4 BACK BOX & 3/4"C STUBBED ABOVE HUNG CEILING.
WI-FI	WI-FI BOOSTER
S a,b	WATTSTOPPER LOW VOLTAGE 2 BUTTON ANALOG SWITCH LVSWI-102. 'A','B' REPRESENT CONTROL DESIGNATION.
S a,b,c	WATTSTOPPER LOW VOLTAGE 3 BUTTON ANALOG SWITCH LVSWI-103. 'A','B','C' REPRESENT CONTROL DESIGNATION.
S a,b,c,d	WATTSTOPPER LOW VOLTAGE 4 BUTTON ANALOG SWITCH LVSWI-104. 'A','B','C','D' REPRESENT CONTROL DESIGNATION.

FIRE ALARM DEVICE LEGEND

	FIRE ALARM 30 CD STROBE NOTIFICATION DEVICE U.O.N
F	MANUAL FIRE ALARM PULL STATION (PROVIDE COVER WHERE ACCESSIBLE TO CHILDREN, INCLUDING CLASSROOMS AND HALLS)
F	FIRE ALARM 75 CD SPEAKER/STROBE NOTIFICATION DEVICE, U.O.N.
F WP	OUTDOOR RATED FIRE ALARM 75 CD SPEAKER/STROBE NOTIFICATION DEVICE
R	RELAY
IAM	INTERFACEABLE ADDRESSABLE MODULE
IAM	IAM WITH RELAY
K	TEST/RESET KEY SWITCH W/ LED
SD	SMOKE DETECTOR
SD/CO	COMBO CARBON MONOXIDE & SMOKE DETECTOR EQUIPPED WITH TEMPORAL 4 SOUNDER BASE
CO	CARBON MONOXIDE DETECTOR EQUIPPED WITH TEMPORAL 4 SOUNDER BASE
HD	HEAT DETECTOR
DSD	DUCT SMOKE DETECTOR
FSD	FIRE SMOKE DAMPER LOCATION. PROVIDE IAM W/RELAY AT FSD AND SMOKE DETECTOR WITHIN 5FT OF FSD.
MF	MONITOR MODULE FOR WATER FLOW
TS	MONITOR MODULE FOR TAMPER SWITCH
DR	MONITOR MODULE WITH 120V RATED RELAY FOR DOOR RELEASE.
FACP	FIRE ALARM CONTROL PANEL
RAAP	FIRE ALARM REMOTE ANNUNCIATOR PANEL

SECURITY DEVICE LEGEND

FR	FACIAL RECOGNITION SYSTEM SCANNER, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
	CAMERA. PROVIDE 3/4" CONDUIT TO SERVER ROOM WHERE WIRING IS EXPOSED.
MD	MOTION DETECTOR. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING. SENSOR TO BE PROVIDED ON EXTERIOR DOOR.
KP	KEYPAD DOOR ENTRY. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
PB	PANIC BUTTON, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
DR	DOOR RELEASE BUTTON. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
DB	DOOR BELL, PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.
SA	SECURITY ALARM CONTROL KEYPAD. PROVIDE BACKBOX & 1" EC STUBBED AND BUSHED ABOVE ACCESSIBLE CEILING.

NOTE: ALL CONDUIT, BACK BOXES, AND WIRING TO BE PROVIDED AND INSTALLED BY CONTRACTOR. ALL CAMERA SYSTEMS TO BE PROVIDED BY LIGHTBRIDGE/FRANCHISEE. ALL SECURITY SYSTEMS TO BE PROVIDED BY CONTRACTOR. CONTRACTOR IS ALSO RESPONSIBLE FOR ALL LOW VOLTAGE WIRING AND PROCURING OF ALL THE ASSOCIATED ACCESSORIES FOR THE SAME INCLUDING TERMINATIONS, PLUGS, PLATES, JACKS, ETC. BASE BID ACCORDINGLY.

ELECTRICAL ABBREVIATIONS

A	AMPERE
A/C	AIR CONDITIONING
A.F.F.	ABOVE FINISH FLOOR
A.R.	AS REQUIRED
ARCH	ARCHITECT
B.B.	BASE BUILDING
BLDG	BUILDING
C, CDT	CONDUIT
C/B	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CLG	CEILING
CRAC	COMPUTER ROOM AIR CONDITIONER
D	DEMOLISH
DEPT.	DEPARTMENT
DJ	DOOR JAM
DN	DOWN
DP	DISTRIBUTION PANEL
DWG	DRAWING
E, EX	EXISTING
EC	EMPTY CONDUIT
EM	EMERGENCY
EQUIP	EQUIPMENT
ER	EXISTING TO BE RELOCATED
ETR	EXISTING TO REMAIN
FIXT	FIXTURE
FL	FLOOR
FLUOR	FLUORESCENT
G, GND	GROUND
GALV	GALVANIZED
GFI	GROUND FAULT INTERRUPTER
HVAC	HEATING, VENTILATING & AIR CONDITIONING
IG	ISOLATED GROUND
LP	LIGHTING PANEL
KW	KILOWATT
LS	LIFE SAFETY
MANF	MANUFACTURER
MAX	MAXIMUM
MECH	MECHANICAL
MIN	MINIMUM
M.O.A.	MULTI-OUTLET ASSEMBLY
MTD	MOUNTED
N	NEW
NL	NIGHT LIGHT
N.I.C	NOT IN CONTRACT
No., #	NUMBER
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
POTS	PLAIN OLD TELEPHONE SERVICE
R, RE	RELOCATED EXISTING EQUIPMENT
REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL
SPEC.	SPECIFICATION
SW	SWITCH
TC	TIME CLOCK
TEL	TELEPHONE
TRAC	TECHNOLOGY ROOM AIR CONDITIONER
T/F, XFMR	TRANSFORMER
TYP.	TYPICAL
U.O.N	UNLESS OTHERWISE NOTED
UP	UTILITY PANEL
V	VOLT
W/	WITH
WP	WEATHER PROOF WHILE IN USE

HVAC SMOKE CONTROL DEVICES

1. DUCT SMOKE DETECTOR:
   - A. THE ELECTRICAL CONTRACTOR SHALL REFER TO THE MECHANICAL DOCUMENTS FOR QUANTITIES AND LOCATIONS OF DUCT SMOKE DETECTORS.
   - B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE REQUIRED NUMBER OF DUCT SMOKE DETECTORS FOR INSTALLATION BY THE MECHANICAL CONTRACTOR.
   - C. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL WIRING, PROGRAMMING, CONNECTION, REMOTE TRIGGERED INDICATION DEVICES AND TEST SWITCHES.
   - D. EACH DUCT SMOKE DETECTORS SHALL HAVE AN ASSOCIATED REMOTE TRIGGERED INDICATOR DEVICE AND TEST SWITCH WHICH SHALL BE INSTALLED AND TO BE COORDINATED WITH ARCHITECT FOR EXACT LOCATION.
   - E. ARRANGE FOR FAN SHUTDOWN BY FIRE ALARM SYSTEM.
   - F. REGARDLESS, IF INDICATED ELSEWHERE, PROVIDE SUFFICIENT NUMBER OF DUCT SMOKE DETECTORS TO COVER ASSOCIATED DUCTWORK CONFIGURATION IF A SINGLE DUCT DETECTOR CANNOT BE INSTALLED.
   - G. ALL UNITS 2,000 CFM OR GREATER SHALL BE PROVIDED WITH DUCT SMOKE DETECTOR.
   - H. UNITS 15,000 CFM OR GREATER SHALL BE PROVIDED WITH DUCT DETECTORS IN BOTH SUPPLY AND RETURN.
2. FIRE SMOKE DAMPERS:
   - A. THE ELECTRICAL CONTRACTOR SHALL REFER TO THE MECHANICAL DOCUMENTS FOR QUANTITIES AND LOCATIONS OF ALL FIRE SMOKE DAMPERS.
   - B. THE ELECTRICAL CONTRACTOR SHALL PROVIDE WIRING FROM EACH FIRE SMOKE DAMPER BACK TO THE MAIN FIRE ALARM PANEL AND ARRANGE FOR EACH DAMPER TO OPERATE IN RESPONSE TO ACTIVATION OF THE FIRE ALARM SYSTEM.
   - C. THE DAMPERS SHALL BE CONTROLLED VIA A COMMAND FROM THE FIRE ALARM SYSTEM PANEL.
   - D. PROVIDE CONTROL WIRING FROM THE MAIN FIRE ALARM PANEL AND ARRANGE TO OPEN/CLOSE OR POSITION DAMPERS AS PER THE SEQUENCE OF OPERATIONS SPECIFIED BY THE MECHANICAL ENGINEER'S DOCUMENTS.

TYPICAL DEVICE MOUNTING HEIGHTS (U.O.N.)

RECEPTACLES (U/CN)	18" AFF
RECEPTACLES (COUNTER)	42" AFF
LIGHT SWITCHES	48" AFF TO TOP OF DEVICE
DISCONNECT SWITCHES	NEC 404.8(A)
TELEPHONE OUTLETS	50" AFF (U.O.N)
COMPUTER OUTLETS	18" AFF (U.O.N)
CLOCK OUTLETS	84" AFF
FIRE ALARM PULL STATION	42" AFF TO BOTTOM OF DEVICE / 44" AFF TO CENTER OF DEVICE
FIRE ALARM AUDIO/VISUAL ALARM	88" AFF T0 BOTTOM OF DEVICE (80" AFF MIN TO BOTTOM OF LENS/96" AFF MAX)
EXIT LIGHTS (WALL MTD)	12" ABOVE DOOR
EMERGENCY LIGHTS(WALL MTD)	90" AFF
TV OUTLETS	68" AFF (U.O.N)
AUDIO OUTLETS	90" AFF (U.O.N)
DOOR RELEASE BUTTON	48" AFF (U.O.N)
PA ANNUNCIATOR PANEL	48" AFF TO TOP OF DEVICE
PA SPEAKERS	88" AFF TO BOTTOM OF DEVICE
PANIC BUTTON	48" AFF (U.O.N)

NOTE: DIMENSIONS ARE TO DEVICE CENTERLINE (U.O.N.)

POWER CONDUCTORS AND CABLES AND INSTALLATION METHODS:

ALL OF THE BELOW ARE GENERAL REFERENCE ONLY. RACEWAYS AND WIRING METHODS MUST BE UTILIZED ONLY WHERE AND WHEN PERMITTED BY CODE.

FEEDER/ BRANCH CIRCUITS	LOCATION	CONDUCTORS/CABLES
FEEDERS	CONCEALED IN CEILINGS, WALLS, PARTITIONS	CONDUCTORS IN EMT, MC CABLE
FEEDERS	CONCEALED IN CONCRETE, BELOW SLAB-GRADE, UNDERGROUND	CONDUCTORS IN PVC/RGS CONDUITS
FEEDERS	OUTDOOR, EXPOSED, DAMP OR WET LOCATIONS	CONDUCTORS IN RGS CONDUITS
FEEDERS	SERVICE ENTRANCE	SCHEDULE 40 PVC WITH GRS ELBOW AND STUB UPS THROUGH CONCRETE SLABS
BRANCH CIRCUITS	EXPOSED, INCLUDING CRAWL SPACES	CONDUCTORS IN EMT CONDUITS
BRANCH CIRCUITS	CONCEALED IN CEILINGS, WALLS AND PARTITIONS.	CONDUCTORS IN EMT CONDUIT, AC CABLE/ MC CABLE

GENERAL LIGHTING NOTES

REFER TO LIGHTING CONSULTANT AND ARCHITECTURAL DRAWINGS FOR FIXTURE SCHEDULES AND INFORMATION RELATED TO LIGHTING. OBTAIN LATEST CONTROL AND LUTRON DRAWINGS AND COORDINATE REQUIRED CIRCUITING.

CODE COMPLIANCE

1	OCCUPANCY TYPE	INSTITUTIONAL, I-4
2	GOVERNING CODES AND REGULATIONS.	NATIONAL ELECTRICAL CODE, NEC 2023 ENERGY CODE: 2021 IECC NFPA-72, 2022 EDITION

CODE COMPLIANT INSTALLATION MEANS/METHODS AND MATERIAL USED

ALL REFERENCES IN THE CONSTRUCTION DOCUMENTS, INCLUDING SPECIFICATIONS, TO THE TYPE OF MATERIALS AND COMMON INSTALLATION PRACTICES SHALL BE USED AS A GUIDELINE AND MAY BE MODIFIED BY THE CONTRACTOR. ANY MODIFICATION SHALL COMPLY WITH APPLICABLE CODE REQUIREMENTS (SHARED NEUTRAL, GROUNDING, COMBINING CIRCUITRY, COPPER VERSUS ALUMINUM, ETC.) AND OTHER DIRECTIVES, AND REGULATIONS MANDATED BY LOCAL AUTHORITIES HAVING JURISDICTION.

SEC, A/V, TELE/COM NOTE

CONTRACTOR IS RESPONSIBLE FOR PROVIDING EMPTY CONDUITS,SLEEVES, STUB-UPS AND BACK BOXES AS WELL AS POWER CIRCUITS, DEVICES AND OTHER APPURTENANCES AS NECESSARY FOR A COMPLETE, OPERATIONAL SECURITY, A/V AND TELE/COM SYSTEM FOR THE BUILDING AS SPECIFIED THEREIN. ALL ASSOCIATED SECURITY, A/V AND TELE/COM WORK IS PART OF THIS CONTRACT AND SHALL BE INCLUDED IN THE ELECTRICAL CONTRACTOR'S BID.

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Lightbridge Academy℠
Innovators in Educational Child Care

PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL COVER SHEET

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
E-001

GENERAL NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR ALL WORK, MATERIAL, AND LABOR TO SATISFY A COMPLETE AND WORKING SYSTEM WHETHER SPECIFIED OR IMPLIED.

2. THE CONTRACTOR SHALL SECURE ALL PERMITS OR APPLICATIONS AND PAY ANY AND ALL FEES AS REQUIRED.

3. ALL WORK ON THE DRAWINGS SHALL BE CONSIDERED AS NEW UNLESS IF EXPLICITLY CALLED OUT AS EXISTING. UPON COMPLETION OF ALL ELECTRICAL WORK, ELECTRICAL CONTRACTOR SHALL ADJUST AND TEST ALL CIRCUITS, OUTLETS, SWITCHES, LIGHTS, MOTORS, AND ANY OTHER ELECTRICAL ITEMS INSTALLED.

4. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC, SIZES AND LOCATION OF EQUIPMENT AND WIRING ARE SHOWN TO SCALE WHERE POSSIBLE, BUT MAY BE DISTORTED FOR CLARITY ON THE DRAWINGS. FINAL LOCATION OF OUTLETS AND EQUIPMENT SHALL BE AS APPROVED BY THE ARCHITECT OR HIS REPRESENTATIVE OR OWNERS AGENTS. IT IS NOT WITHIN THE SCOPE OF DRAWINGS TO SHOW ALL NECESSARY BENDS, OFFSETS, PULL BOXES AND OBSTRUCTIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL HIS WORK TO CONFORM TO THE STRUCTURE, PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAN.

5. FIELD MOUNTED DEVICES SUCH AS SWITCHES, MOTOR STARTERS, RECEPTACLES, ETC., ARE SHOWN IN THEIR APPROXIMATE LOCATION. SWITCH MOUNTING HEIGHT SHALL BE 48" ABOVE FINISHED FLOOR AND RECEPTACLE MOUNTING HEIGHT SHALL BE 18" ABOVE FINISHED FLOOR.

6. ALL RECEPTACLES SHALL BE GROUNDING TYPE.

7. ALL RECEPTACLES INSTALLED IN BATHROOMS AND KITCHENS SHALL HAVE GROUND-FAULT CIRCUIT INTERRUPTER PROTECTION AS REQUIRED BY THE NATIONAL ELECTRIC CODE 210.8(A)(1) & 210.8(A)(6).

8. ALL ELECTRIC MATERIALS AND EQUIPMENT FOR THE PROJECT SHALL BE NEW AND U.L. OR EQUALLY APPROVED.

9. CONTRACTOR TO CONFIRM EXACT LOCATION OF METERS WITH ELECTRIC UTILITY.

10. SUBMIT TO THE OWNER CERTIFICATES OF INSPECTIONS IN DUPLICATE FROM AN APPROVED INSPECTION AGENCY UPON COMPLETION.

11. BIDDERS, BEFORE SUBMITTING A PROPOSAL, SHALL VISIT AND CAREFULLY EXAMINE THE AREAS AFFECTED BY THIS WORK TO BECOME FAMILIAR WITH CONDITIONS AND WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH EXAMINATION BEEN MADE.

12. FURNISH AND INSTALL WIRING FOR EQUIPMENT FURNISHED BY OTHERS, AS SHOWN ON ARCHITECTURAL, HVAC, PLUMBING AND/OR ELECTRICAL DRAWINGS. COORDINATE WITH OTHER TRADES FOR DETAILS OF INSTALLATION AND WIRING REQUIREMENTS. THE TERM "WIRING" AS USED HEREIN SHALL INCLUDE FURNISHING AND INSTALLING CONDUIT, WIRES, JUNCTION/OUTLET BOXES, DISCONNECTS, OVERCURRENT PROTECTION AND FINAL CONNECTIONS. COORDINATE FINAL CONDUCTOR SIZES, QUANTITIES, VOLTAGE REQUIREMENTS, AND OVERCURRENT DEVICE AND OUTLET RATINGS WITH ACTUAL EQUIPMENT TO BE FURNISHED TO THE SITE PRIOR TO FINALIZING WIRING INSTALLATION. MINOR ADJUSTMENTS TO WIRING REQUIREMENTS NECESSARY TO ACCOMMODATE ACTUAL FURNISHED EQUIPMENT SHALL BE PROVIDED AT NO ADDITIONAL COST TO OWNER.

13. VERIFY LOCATIONS AND QUANTITY OF ALL ELECTRICAL EQUIPMENT WITH ARCHITECTURAL DRAWINGS OR INTERIOR DETAILS. IN CENTERING OUTLETS AND LOCATING BOXES OR OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS, MECHANICAL EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILING, ETC., AND CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.

14. VERIFY THAT NO CONFLICTS EXIST WHICH WOULD PROHIBIT THE INSTALLATION OF AND ALL MECHANICAL, TELEPHONE, ELECTRICAL, LIGHTING, PLUMBING AND SPRINKLER EQUIPMENT (INCLUDING ALL REQUIRED PIPING, DUCTWORK AND CONDUITS) DUE TO CLEARANCE REQUIREMENTS FOR MAINTENANCE AND ACCESS TO ALL TRADES EQUIPMENT AS PER N.E.C. DEDICATED SPACE REQUIREMENTS.

15. ALL WORK SHALL BE PERFORMED SUCH AS TO LEAST INTERFERE OR INCONVENIENCE NORMAL OPERATIONS OF ADJACENT SPACES.

16. ALL WORKS SHOWN ON THE DRAWINGS SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR, UNLESS OTHERWISE INDICATED.

17. SEE MECHANICAL CONTRACT DOCUMENTS FOR EXACT QUANTITY, LOCATION AND ELECTRICAL CHARACTERISTICS OF MECHANICAL EQUIPMENT.

18. SEE PLUMBING/FIRE PROTECTION CONTRACT DOCUMENTS FOR EXACT QUANTITY, LOCATION AND ELECTRICAL CHARACTERISTICS OF PLUMBING/FIRE PROTECTION EQUIPMENT.

19. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL FINAL CONNECTIONS.

20. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR ALL CONNECTION TO EQUIPMENT TERMINALS, IF NOT AN INTEGRAL PART OF THE EQUIPMENT, AND SPLICES SHALL BE BY MEANS OF APPROVED COMPRESSION TYPE COPPER CONNECTORS.

21. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS AND LOCATION OF LIGHT FIXTURES ON PLAN. COORDINATE FIXTURE LOCATIONS WITH FIRE PROTECTION AND MECHANICAL/CONTRACTOR. NOTIFY ARCHITECT OF ANY CONFLICTS.

22. SEE ARCHITECTURAL FOR EXACT QUANTITY & LOCATIONS OF LIGHTING FIXTURES AND TYPE OF CEILING CONSTRUCTION. WHERE DISCREPANCIES IN LOCATION OCCUR BETWEEN ARCHITECTURAL AND ENGINEERING DRAWINGS, THE ARCHITECTURAL DRAWINGS GOVERN.

23. SEE ARCHITECTURAL ELEVATIONS AND DETAILS FOR EXACT QUANTITY & LOCATIONS AND MOUNTING HEIGHTS OF RECEPTACLES AND OUTLETS FOR ELECTRICAL DEVICES, WHERE APPLICABLE.

24. COORDINATE LOCATION OF ALL DEVICES (I.E.. DETECTORS, FIXTURES, AND ALL OTHER CEILING MOUNTED DEVICES) WITH OTHER TRADES (I.E.. DUCTWORK, SPRINKLERS, ETC.).

25. LIGHTING AND APPLIANCE CIRCUIT NUMBERS NOTED ON PLANS ARE INTENDED AS A GUIDE. FINAL NUMBERING SYSTEM TO BE NOTED ON AS-BUILT DRAWINGS AND ON TYPED PANELBOARD DIRECTORY CARDS.

26. WHEREVER A CIRCUIT OR HOMERUN IS NOTED (I.E. AT EACH LOCATION WHERE A JUNCTION/PULL BOX WITH A HOMERUN NOTATION IS INDICATED FOR AN ITEM OF EQUIPMENT, AT EACH LOCATION WHERE A DISCONNECT SWITCH FOR A MOTOR IS INDICATED WITH THE FEEDER SIZING PER SCHEDULE, ETC.) CONNECT THE ITEM WITH THE REQUIRED CONDUIT AND WIRE FROM SOURCE TO LOAD.

27. QUANTITY AND SIZE OF WIRE (CABLE) AND SIZE OF CONDUIT SHALL BE AS REQUIRED BY CODE IF NOT SPECIFICALLY INDICATED, NOTED SIZES ARE FOR REFERENCE AND ARE MINIMUMS. INCREASE WIRE SIZE AS REQUIRED FOR VOLTAGE DROP.

28. THE TYPE OF CONDUIT SHALL BE AS FOLLOWS FOR ALL FEEDERS AND DISTRIBUTION CIRCUITS, UNLESS OTHERWISE SPECIFIED.

APPLICATION	TYPE OF CONDUIT
BURIED IN CONCRETE OR MASONRY, OR OUTDOORS	GALV. RIGID STEEL
SERVICE ENTRANCE	PVC
SUPPLY TO DISTRIBUTION PANELS AND HVAC EQUIPMENT	EMT OR MC (OR NM FOR TYPES III, IV AND V CONSTRUCTION)
BRANCH CIRCUITS	EMT OR MC (OR NM FOR TYPES III, IV AND V CONSTRUCTION)

29. PROVIDE ALL NECESSARY CONNECTIONS.
30. PROVIDE ALL REQUIRED GROUNDING. ALL GROUND WIRE SHALL BE ENCLOSED IN CONDUIT.

31. PROVIDE ALL AUXILIARY STEEL MEMBERS AS REQUIRED FOR THE SUPPORT OF ELECTRICAL WORK TO BUILDING STRUCTURE. SECURE ALL SUPPORTS TO BUILDING STRUCTURE AS REQUIRED.

32. RACEWAY AND CONDUIT ROUTING SHOWN IS DIAGRAMMATIC AND INDICATES GENERAL INTENT, ACTUAL ROUTING MUST BE COORDINATED WITH FIELD CONDITIONS AND ADJUSTED AS REQUIRED. FINAL ROUTING OF CONDUITS AND RACEWAY SHALL BE DETERMINED BY THE ELECTRICAL CONTRACTOR

33. UNLESS OTHERWISE INDICATED ALL RACEWAYS SHALL BE INSTALLED CONCEALED IN FINISHED AREAS.

34. RUN EXPOSED RACEWAYS PARALLEL TO OR AT RIGHT ANGELS TO WALLS.

35. POWER WIRING SHALL BE COPPER CONDUCTOR WITH "THHN OR THWN" INSULATION RATED 600 VOLTS MINIMUM CONDUCTOR SIZE, MINIMUM WIRE SIZE OF POWER WIRING SHALL BE #12 AWG. LIGHTING AND RECEPTACLE BRANCH CIRCUIT WIRING SHALL BE #12 AWG UNLESS OTHERWISE NOTED ON DRAWINGS OR SCHEDULES INCREASE CONDUIT SIZE TO SUIT AS REQUIRED TO COMPLY WITH VOLTAGE DROP REQUIREMENTS AND NOT TO EXCEED 3% OF VOLTAGE DROP FROM CIRCUIT BREAKER TO THE FURTHEST OUTLET. QUANTITY OF CONDUCTORS SHALL BE AS REQUIRED.

36. FURNISH FISH WIRE IN EACH RACEWAY RUN IN WHICH WIRING IS NOT INSTALLED.

37. WIRING TO AND FROM AN ITEM SHALL BE SIZED THE SAME UNLESS OTHERWISE REQUIRED. PIPE SLEEVES SHALL BE PROVIDED WHERE CONDUITS ARE ROUTED THROUGH FOUNDATION WALLS.

38. PIPE SLEEVES SHALL BE GROUTED IN WALLS. SEALANT SHALL BE APPLIED AROUND THE CONDUIT IN THE SLEEVE IN ORDER TO PREVENT INGRESS OF MOISTURE. THE WALL PENETRATION SHALL BE COMPLETELY WATERPROOFED.

39. BOLT ON TYPE LUGS SHALL BE FASTENED WITH TWO BOLTS MINIMUM.

40. INTERCONNECT DEVICES/FIXTURES WITH SAME CIRCUIT NUMBER WITH REQUIRED WIRE AND CONDUIT AND ENERGIZE FROM CIRCUIT IN ASSOCIATED PANEL.

41. PROVIDE ALL REQUIRED PULL, JUNCTION, OUTLET BOXES AND TROUGHS.

42. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE.

43. PROVIDE BACKBOXES FOR ALL DEVICES, EQUIPMENT, ETC.

44. PROVIDE BLANK COVER PLATES OVER ALL UNUSED OPENINGS IN PANELBOARDS, PULL AND JUNCTION BOXES AND TROUGHS,

45. INSTALL AND CONNECT EVERY STARTER AND VARIABLE FREQUENCY DRIVE FURNISHED BY OTHER TRADES/VENDORS ON THIS PROJECT.

46. RATING OF DISCONNECT SWITCHES TO MATCH OVERCURRENT PROTECTIVE DEVICE U.O.N.

47. EXIT LIGHTS, EMERGENCY BATTERY PACKS & NIGHT LIGHTS SHALL NOT BE SWITCHED. CONNECT TO UNSWITCHED LEG OF ASSOCIATED CIRCUIT.

48. CIRCUITS FOR COMPUTER RECEPTACLES AND LIGHTING SHALL BE PROVIDED WITH A SEPARATE GROUND WIRE.

49. EACH BRANCH CIRCUIT SERVING SHALL BE PROVIDED WITH GROUND WIRE AS REQUIRED.

50. PROVIDE ALL NECESSARY TEMPORARY AND INTERIM ELECTRICAL POWER WORK (PANELS, LIGHTING FIXTURES, DISCONNECT SWITCHES, RECEPTACLES, WIRE, CONDUITS, BREAKERS, CONNECTIONS, FUSES, FUEL, ETC.) REQUIRED TO INSTALL THE PERMANENT WORK.

51. WHENEVER EXCAVATION OR CUTTING OF SLABS ARE PERFORMED, THE CONTRACTOR SHALL HIRE AN EXPERT TO PERFORM SUBSURFACE SCANS TO IDENTIFY AND FLAG UTILITIES, SO THEY ARE NOT DAMAGED. NOTIFY THE APPROPRIATE AGENCIES AND PERFORM A MARK-OUT PRIOR TO ANY EXCAVATION.

52. LOCATE JUNCTION AND PULL BOXES TO BE CONCEALED IN FINISH SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. PROVIDE PULL BOXES WHERE NECESSARY FOR WIRE PULLING. COORDINATE ALL BOX LOCATIONS WITH OTHER TRADES. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE.

53. UPON COMPLETION OF ALL ELECTRICAL WORK, ELECTRICAL CONTRACTOR SHALL BALANCE ALL PANELBOARDS AFFECTED TO WITHIN 10 % DEVIATION BETWEEN PHASES.

54. AFTER COMPLETION OF WORK, CLEAN UP ALL RESULTANT DEBRIS AND REMOVE FROM THE SITE.

55. ALL PENETRATIONS THROUGH FIRE RATED WALLS OR FLOORS SHALL BE SEALED TO PREVENT THE SPREAD OF SMOKE AND FIRE. THE FIRE RATING OF THE PENETRATION SEALING METHOD SHALL MATCH THE RATING OF THE WALL OR FLOOR. PROVIDE ONLY UL LISTED MATERIAL AND COMPONENTS.

56. PROVIDE GFI TYPE PROTECTION FOR ANY DEVICE WITHIN 6' OF SINK, WATER OR LIQUIDS AND LOCATED OUTSIDE OF THE BUILDING.

57. THE CONTRACTOR SHALL TAG EACH AND EVERY PANELBOARD, DISCONNECT SWITCH MOTOR STARTER OR CONTROLLER AND CONTROL DEVICE INSTALLED OR WIRED UNDER THIS CONTRACT, TAGGING SHALL BE BY MEANS OF ENGRAVED PHENOLIC NAMEPLATES (WHITE LETTERING, BLACK BACKGROUND). EMERGENCY DISTRIBUTION SYSTEM COMPONENTS SHALL UTILIZE WHITE LETTERING ON RED BACKGROUNDS.

58. THE ELECTRICAL CONTRACTOR SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS:

A. THE NATIONAL ELECTRIC CODE, STATE LAWS, AND ALL OTHER REGULATIONS GOVERNING WORK OF THIS NATURE.
B. UNDERWRITERS LABORATORIES, INC. (UL)
C. OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
D. AMERICAN DISABILITIES ACT (ADA), 2010
E. ALL LOCAL JURISDICTION DIRECTIVES AND REQUIREMENTS.
F. APPLICABLE NFPA SECTIONS.

59. WHERE DISCREPANCIES IN EQUIPMENT, DEVICE, AND FIXTURE LOCATIONS OCCUR BETWEEN ARCHITECTURAL AND ENGINEERING DRAWINGS, ARCHITECTURAL DRAWINGS GOVERN.

60. ALL ABOVE COUNTER RECEPTACLE OUTLETS IN THE KITCHEN(S) SHALL BE GFI TYPE.

61. "BACK-TO-BACK" ELECTRICAL OUTLETS IN ADJACENT ROOMS SHALL BE INSTALLED AS FOLLOWS:

A. BOXES LOCATED ON OPPOSITE SIDES OF WALLS OR PARTITIONS SHALL BE SEPARATED BY A MINIMUM HORIZONTAL DISTANCE OF 24 in. THIS MINIMUM SEPARATION DISTANCE BETWEEN BOXES MAY BE REDUCED WHEN WALL OPENING PROTECTIVE MATERIALS (CLIV) ARE INSTALLED ACCORDING TO THE REQUIREMENTS OF THE CLASSIFICATION.

62. UNLESS INDICATED OTHERWISE, ALL CURRENT CARRYING CONDUCTORS SHALL BE COPPER.

63. PROVIDE CABLE SUPPORT BOXES IN ALL VERTICAL CONDUIT RUNS AS PER CODE REQUIRED SPACING.

64. GROUNDING

A. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL GROUNDING SYSTEMS (AS REQUIRED) IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE.
B. GROUND SHALL CONSIST OF CONNECTING THE NEUTRAL CONDUCTOR OF THE EQUIPMENT TO A GROUND SOURCE.

65. GROUND CONTINUITY SHALL BE MAINTAINED THROUGHOUT.

66. DISTRIBUTION EQUIPMENT SHALL BE BRACED TO WITHSTAND THE AVAILABLE SHORT CIRCUIT CURRENT.

67. NOTIFY ENGINEER OF CONFLICTS BETWEEN DRAWINGS AND SPECIFICATIONS BEFORE SUBMITTAL OF BID PROPOSAL. THE ENGINEER'S DECISION WILL GOVERN EITHER BEFORE OR AFTER BIDDING.

68. FURNISH ALL PERMITS AND FILINGS AS REQUIRED AS A PART OF THIS CONTRACT.

69. COLOR OF ALL WIRING DEVICES (SWITCHES, RECEPTACLES, PLATES, ETC.) SHALL BE APPROVED BY THE ARCHITECT PRIOR TO PURCHASE.

70. ELECTRICAL CONTRACTOR SHALL COORDINATE FINAL LOCATION OF REMOTE CONTROL OVERRIDE RELAY SWITCHES IN FIELD WITH ARCHITECT OR REFER TO ARCHITECT'S DRAWINGS.

71. FURNISH ALL PERMITS AND FILINGS AS REQUIRED AS PART OF THIS CONTRACT. PAY ALL REQUIRED APPLICATION AND FILING FEES.

72. UNLESS OTHERWISE DIRECTED BY ARCHITECT, PROVIDE STAINLESS STEEL COVER PLATES FOR UNUSED JUNCTION BOXES REQUIRED BY BUT NOT LIMITED TO TELECOMMUNICATION, SECURITY, AUDIO VISUAL SYSTEM DEVICES.

73. DISTRIBUTION SYSTEM SHALL BE FULLY RATED. SHORT CIRCUIT INTERRUPTING CAPACITY FOR ALL PANELBOARDS SHALL NOT BE LESS THAN INDICATED IN THE CONTRACT DOCUMENTS AND SHALL BE INCREASED AS REQUIRED BY THE SHORT CIRCUIT COORDINATION AND ARC FLASH HAZARD ANALYSIS STUDY WITHOUT ADDITIONAL COST TO THE OWNER.

74. USE RIGID GALVANIZED STEEL FOR ALL BENDS AND STUB-UPS IN UNDERGROUND CONDUITS.

75. SERVICE ENTRANCE

A. COMPLY WITH ALL OF THE CONTRACT DOCUMENTS, INCLUDING DRAWINGS, SCHEDULES, GENERAL AND SUPPLEMENTARY CONDITIONS, GENERAL REQUIREMENTS.

B. THE WORK COVERED BY THIS SECTION OF THE SPECIFICATIONS SHALL INCLUDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES TO FURNISH AND INSTALL NEW SERVICE EQUIPMENT AS DESCRIBED HEREIN AND SHOWN ON THE DRAWINGS.

C. THIS CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE UTILITY COMPANY (SERVICE LAYOUT, ETC.) AND SPECIFICATIONS FOR THE ACCURATE AND TIMELY COMPLETION OF THE SERVICE WORK.

D. THIS CONTRACTOR SHALL MAKE APPLICATION FOR THE REQUIRED PERMITS AND APPROVALS. THE NEW SERVICE FACILITIES IN THE NAME OF THE OWNER AND BEAR ALL COSTS IN RELATION TO THE INSTALLATION OF THE PERMANENT ELECTRIC SERVICE FOR THE BUILDING. THE ELECTRICAL CONTRACTOR SHALL:

1) FURNISH AND INSTALL ALL SERVICE EQUIPMENT AS REQUIRED.
2) FURNISH AND INSTALLED REQUIRED RACEWAY AND CABLE FROM UTILITY TO NEW SERVICE EQUIPMENT.

E. THE WORK OF THE ELECTRICAL CONTRACTOR SHALL GENERALLY BE AS FOLLOWS:

1) BOND AND GROUND ALL CABLES, CONDUITS, AND ELECTRICAL EQUIPMENT IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY, THE ELECTRICAL CODE AND ALL AUTHORITIES HAVING JURISDICTION.
2) INSTALL ALL SERVICE AND METERING EQUIPMENT, METERING CURRENT TRANSFORMERS AND ASSOCIATED METER WIRING. PROVIDE AND INSTALL ANY METERING COMPONENTS AND MATERIAL NOT PROVIDED BY THE UTILITY COMPANY. PROVIDE FOR CONNECTIONS TO TOTALIZING METERS IF PRESENT.
3) INSTALL ALL MATERIALS PER UTILITY COMPANY SPECIFICATIONS.

F. THE CONTRACTOR SHALL, BEFORE SUBMITTING HIS BID, CONSULT WITH REPRESENTATIVE OF THE UTILITY COMPANY TO DETERMINE THE EXTENT OF HIS WORK REGARDING THE ELECTRIC SERVICE AND THEIR REQUIREMENTS FOR INSTALLATION OF SAME. HE SHALL PAY ANY AND ALL CHARGES IN CONNECTION WITH THE ELECTRIC SERVICE AS REQUIRED BY THE UTILITY COMPANY. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY, THE ELECTRIC CODE AND ALL OTHER MUNICIPAL AGENCIES AND DEPARTMENTS HAVING JURISDICTION. NO ALLOWANCE WILL BE MADE IF THE CONTRACTOR FAILS TO CONSULT THE UTILITY COMPANY REGARDING SAME.

G. ALL PRODUCTS SHALL BE AS RECOMMENDED AND APPROVED BY UTILITY COMPANY. CONTRACTOR SHALL SECURE THE APPROVAL OF THE UTILITY COMPANY FOR ALL EQUIPMENT PRIOR TO INSTALLATION.

H. PROVIDE 6" DIAMETER SLEEVES (GRS) THRU FOUNDATION WALL FOR ELECTRICAL SERVICE CONDUITS. FOUNDATION WALL PENETRATION SHALL BE DONE USING CORE DRILL. QUANTITY OF SLEEVES AS REQUIRED. PROVIDE MINIMUM 2 SPARE SLEEVES.

I. PROVIDE WATERPROOF LINK SEAL AROUND RIGID STEEL CONDUIT AT BOTH THE EXTERIOR AND INTERIOR OF THE FOUNDATION WALL. HYDRAULIC NON-SHRINK GROUT SHALL BE APPLIED IN THE EXTERIOR AND INTERIOR AFTER INSTALLATION OF LINK SEAL. PROVIDE ADDITIONAL MATERIALS IF REQUIRED BY ARCHITECT.

J. PROVIDE 4"AWG COPPER GROUND CONDUCTOR CONNECTED TO RE-BAR IN BUILDING FOOTING AND EXTEND TO MAIN SWITCHBOARD LOCATION. LEAVE SUFFICIENT SLACK TO CONNECT TO MAIN SWITCHBOARD GROUND BUS. CONDUCTOR SHALL NOT BE SPLICED. CONNECT TO RE-BAR VIA EXOTHERMIC WELD CONNECTION. RE-BAR MUST BE MINIMUM 1/2" DIAMETER AND 20 FEET IN LENGTH.

76. PROVIDE CONDUIT EXPANSION/DEFLECTION COUPLING BETWEEN BUILDINGS AND WHERE SUBJECT TO VIBRATION.

77. PROVIDE CONDUIT EXPANSION FITTINGS AT EVERY CONCRETE AND STRUCTURAL EXPANSION OR CONTROL JOINT .

78. ALL NORMAL POWER EXTERIOR ELECTRICAL INSTALLATIONS SHALL BE WEATHERPROOF, NEMA 3R TYPE. ALL EMERGENCY POWER EXTERIOR ELECTRICAL INSTALLATIONS SHALL BE WEATHERPROOF, NEMA 4X TYPE.

79. PROVIDE GROUND FAULT PROTECTION AS REQUIRED BY THE ELECTRICAL CODE.

80. ALL RECEPTACLES SERVED FROM THE EMERGENCY SYSTEM SHALL HAVE THE PANELBOARD AND CIRCUIT NUMBER SERVING THEM MARKED ON A FACEPLATE.

81. SHORT CIRCUIT, COORDINATION AND ARC FLASH STUDY SHALL BE PREPARED BY THE ENGINEER LICENSED IN THE STATE AND SUBMITTED TO THE ENGINEER OF RECORD FOR REVIEW AND APPROVAL. EQUIPMENT SHALL BE NOT BE PURCHASED PRIOR TO EQUIPMENT APPROVAL.

82. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ELECTRICAL WIRING TO ALL ELECTRICAL HEATING EQUIPMENT SUCH AS BUT NOT LIMITED TO CABINET UNIT HEATERS, UNIT HEATERS, HEAT TRACING, ELECTRIC FIN TUBE RADIATOR, ELECTRIC RADIANT FLOOR, ELECTRIC RADIAN HEATERS, ETC. REFER TO MECHANICAL AND PLUMBING DRAWINGS FOR ADDITIONAL INFORMATION.

83. PROVIDE CONDUIT EXPANSION/DEFLECTION FITTINGS BETWEEN BUILDINGS, AND WHERE SUBJECT TO VIBRATION.

84. CONTRACTOR TO ARRANGE WIRING FOR INTERFACING 3 PHASE TO SINGLE PHASE WIRING AND BALANCING THE LOAD.

85. PROVIDE PANIC HARDWARE FOR ALL DOORS IN MAIN ELECTRICAL ROOMS. DOORS SHALL SWING OUT OF THE ROOM AND SHALL BE EQUIPPED WITH CRASH-BAR TYPE OPENING DEVICES ON THE INSIDE AND PASSAGE HANDLES ON THE OUTSIDE.

86. ALL EQUIPMENT AND DEVICES LOCATED IN FIRE ALARM CONTROL ROOM SHALL BE INSTALLED NO LESS THAN 3 FEET ABOVE FINISHED FLOOR AND ABOVE FLOOD LEVEL.

87. ALL ELECTRICAL EQUIPMENT SHALL BE INSTALLED ABOVE BASE FLOOD ELEVATION.

88. SHOP DRAWINGS SHALL IDENTIFY ALL OPTIONS PROVIDED AND LIST ALL DEVIATIONS FROM SPECIFICATIONS AND DRAWINGS. IF THERE ARE NO DEVIATIONS FROM SPECIFICATION, INCLUDE A STATEMENT THAT SHOP DRAWING IS IN EXACT COMPLIANCE WITH SPECIFICATIONS.

89. UNLESS INDICATED OTHERWISE ALL DISCONNECTS, STARTERS AND VARIABLE FREQUENCY DRIVES (VFD'S) SHALL BE LOCATED 10 FEET FROM ASSOCIATED EQUIPMENT. FOR OUTDOOR EQUIPMENT, PROVIDE NEMA 3R DISCONNECTS, STARTERS AND VFD'S. ALL ELECTRICAL DEVICES SHALL BE INDEPENDENTLY SUPPORTED.EXTERIOR MOUNTED VFD'S SHALL BE PROVIDED WITH INTERNAL HEATER.

90. FOR EQUIPMENT REQUIRING EMERGENCY SHUT OFF, PROVIDE EMERGENCY PUSHBUTTON AND ASSOCIATED CONTROL WIRING AS PER MANUFACTURER RECOMMENDATIONS.

91. PROVIDE CONTROL WIRING FOR ALL REMOTE EQUIPMENT. COORDINATE EXACT REQUIREMENTS WITH THE EQUIPMENT MANUFACTURER.

92. ELECTRICAL DEVICES AND INSTALLATIONS SHALL COMPLY WITH APPLICABLE ENERGY CONSERVATION CODE SECTIONS.

93. FOR EACH ELECTRICAL PANELBOARD PROVIDE INSTALLED CLOSED CELL NEOPRENE FOAM TAPE PANEL AND DRYWALL AROUND ACCESS DOOR.

94. ALL CONDUIT PENETRATIONS SHALL BE SEALED. GAPS SHALL BE FILLED WITH BACKER ROD AS NECESSARY AND FILLED WITH MINIMUM OF 25-YEAR SEALANT COMPATIBLE WITH SURFACES. WHERE SMOOTH SURFACE ALLOW, MECHANICAL GASKET SEALS MAY BE USED WHEN APPROVED BY THE ARCHITECT.

95. ALL SPACES, EXCEPT THOSE INTENDED FOR 24 HOUR OPERATION, OR WHERE AUTOMATIC SHUTOFF WOULD ENDANGER THE SAFETY OF THE OCCUPANTS, MUST HAVE OCCUPANCY SENSORS OR AUTOMATIC BI-LEVEL LIGHTING CONTROLS.

97. NOT USED.

98. PROVIDE 4" HIGH HOUSEKEEPING PAD FOR EACH FLOOR (FREE) STANDING ELECTRICAL EQUIPMENT. PAD SHALL EXTEND 3" BEYOND FOOTPRINT OF THE EQUIPMENT UNLESS OTHERWISE DIRECTED BY ARCHITECT, PROVIDE STAINLESS STEEL COVER PLATES FOR UNUSED JUNCTION BOXES.

99. ALL EMERGENCY AND STANDBY POWER FEEDERS SHALL BE A LISTED ELECTRICAL CIRCUIT PROTECTIVE SYSTEM WITH A MINIMUM OF 2 HOUR FIRE RATING, UNLESS PERMITTED OTHERWISE BY APPLICABLE ELECTRICAL CODE.

100. ALL JUNCTION BOXES ON DEMISING WALL SHALL BE PUT TO PACKED SEALED.

103. SPECIAL PURPOSE RECEPTACLE OUTLET NEMA CONFIGURATION SHALL MATCH ASSOCIATED EQUIPMENT PLUG RATING.

104. THE SPACE EQUAL TO THE WIDTH AND DEPTH OF THE EQUIPMENT AND EXTENDING FROM THE FLOOR TO THE HEIGHT OF SIX FEET ABOVE THE EQUIPMENT OR TO THE STRUCTURAL CEILING SHALL BE DEDICATED TO THE ELECTRICAL INSTALLATION. NO PIPING, DUCTS, LEAK PROTECTION APPARATUS OR OTHER EQUIPMENT FOREIGN TO THE ELECTRICAL INSTALLATION SHALL BE LOCATED IN THIS ZONE. WORKING CLEARANCES AROUND ELECTRICAL EQUIPMENT SHALL BE PROVIDED AS PER NEC SECTION 110.26. NO STORAGE IS PERMITTED WITHIN WORKING CLEARANCE SPACE.

105. VOLTAGE DROP SHALL NOT EXCEED 5% FROM POINT OF SERVICE TO THE FURTHEST ELECTRICAL OUTLET OR DEVICE. 20 AMP HOME RUN CIRCUITS MORE THAN 75 FEET FROM THE PANEL- BOARD SHALL BE MADE WITH #10 AWG OR LARGER AS REQUIRED TO LIMIT VOLTAGE DROP TO 2% MAXIMUM.

106. ALL COMMUNICATION WIRING SHALL BE INSTALLED AS PER NEC 2017, SECTION 800.

107. CODE COMPLIANT ARC-FLASH WARNING LABELS SHALL BE PROVIDED AS PER RESULTS OF SHORT CIRCUIT AND COORDINATION STUDY.

108. PERFORMANCE AND WITNESSING OF TESTS

A. THE CONTRACTOR SHALL FURNISH ALL INSTRUMENTS AND QUALIFIED PERSONNEL OR FIRM TO PERFORM ALL REQUIRED TESTS.

B. ALL NEW AND RECONNECTED ELECTRICAL CIRCUIT SHALL BE TESTED TO INSURE CIRCUIT CONTINUITY, INSULATION RESISTANCE, PROPER SPLICING AND GROUNDING IN ACCORDANCE WITH THE LATEST STANDARDS AS STATED ABOVE. BEFORE CONNECTING POWER CABLES TO MOTORS, THE INSULATION RESISTANCE OF ALL MOTOR WINDINGS SHALL BE TESTED IN ACCORDANCE WITH THE ABOVE STANDARDS.

C. ANY CONTRACTOR FURNISHED AND/OR INSTALLED SPLICE, RECOMMENDED VOLTAGE AND INSULATION RESISTANCE TESTS, SHALL BE CONNECTED OR REPLACED BY THE CONTRACTOR AT HIS EXPENSE.

D. NO EQUIPMENT SHALL BE ENERGIZED UNTIL ALL TESTS AND ADJUSTMENTS HAVE BEEN MADE.

E. THREE COPIES OF ALL TEST RESULTS SHALL BE DELIVERED TO THE OWNER.

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Lightbridge Academy℠
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PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL GENERAL NOTES

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
E-002

FIRE ALARM NOTES

1. ALL ROUTING OF CABLES FOR FIRE ALARM SYSTEM SHALL BE DIRECTED AND APPROVED BY ARCHITECT.
2. THE FIRE ALARM RISER DIAGRAM SHOWN IS AN INDICATION OF THE WORK REQUIRED AND SHALL BE USED FOR ESTIMATING PURPOSES ONLY AND IS NOT A POINT-TO-POINT WIRING DIAGRAM.
3. THE OPERATION OF THE FIRE ALARM INSTALLATION DOES NOT CONSTITUTE AN ACCEPTANCE OF THE WORK BY THE OWNER. FINAL ACCEPTANCE IS TO BE MADE AFTER THE CONTRACTOR HAS DEMONSTRATED THAT THE WORK FULFILLS THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS AND HAS FURNISHED ALL REQUIRED CERTIFICATES OF APPROVAL FROM THE STATE AUTHORITIES, MUNICIPAL AUTHORITIES FIRE DEPARTMENT AND UNDERWRITERS.
4. INCLUDE ALL FEES FOR FILING APPROVALS, AND SELF CERTIFICATION OF THE FIRE ALARM INSTALLATION.
5. SYSTEM SHALL INCLUDE ELEVATOR RECALL AND FAN SHUTDOWN FUNCTIONS PER THE SEQUENCE OF OPERATION. UTILIZE INTELLIGENT DEVICES AND MODELS AS SHOWN ON THE DRAWINGS.
6. THE FOLLOWING SPECIAL INSPECTIONS SHALL BE PERFORMED BY THE ELECTRICAL CONTRACTOR:
   A. FIRE ALARM TEST.
7. THE FIRE ALARM CONTRACTOR SHALL PROVIDE AN ADDRESSABLE RELAY AT EACH AHU AND EF. CONTRACTOR TO PROVIDE WIRING TO THE STARTER OR VFD TO ENSURE SHUTDOWN NO MATTER WHAT POSITION DEVICE IS IN (I.E. HAND, AUTO, ETC.) THE BMS SYSTEM MUST ALSO RECEIVE A SIGNAL FROM THIS RELAY SO THAT A "SECONDARY SHUTDOWN" CAN BE PERFORMED TO PREVENT UNNECESSARY ALARMS.
8. DEVICES AND OUTLETS WHERE SUBJECTED TO PHYSICAL DAMAGE (GYMNASIUM, PLAYFIELD, ETC.) SHALL BE PROPERLY PROTECTED BY MEANS OF GUARDMESH, PLEXIGLAS COVERS, ETC.
9. ALL WIRING, POWER, CONDUCTORS, CONDUITS ETC. SHALL MEET NATIONAL ELECTRICAL CODE 2017 ARTICLE 760.
10. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2018 PENNSYLVANIA INTERNATIONAL BUILDING CODE AND NFPA 72 2016 EDITION.
11. ALL FIRE ALARM CIRCUITS SHALL BE SIZED TO A MAXIMUM OF 80% OF CAPACITY.
12. ALL FIRE ALARM CIRCUITS SHALL BE WIRED NFPA (CLASS B) WITH THE EXCEPTION OF THE NETWORK CIRCUIT WHICH SHALL BE NFPA (CLASS A). ALL AUDIBLE AND VISUAL CIRCUITS SHALL BE CLASS B.
13. CONDUITS MAY NOT ENTER THE TOP OF ANY FIRE ALARM EQUIPMENT CABINET.
14. ALL FIRE ALARM EQUIPMENT SHALL BE INSTALLED WITH AESTHETICS IN MIND. CABINETS SHALL BE SEMI FLUSH MOUNTED AND CABLE TRAYS SHALL BE HIDDEN.
15. ALL FIRE ALARM WIRE SHALL BE CLEARLY LABELED IN JUNCTION BOXES AND CABINETS. ALL TERMINALS SHALL BE NUMBERED AND LABELED. ALL CONNECTIONS SHALL BE EITHER SOLDERED, APPROVED TERMINAL STRIPS OR SCOTCH LOCKS.
16. ALL LOW VOLTAGE FIRE ALARM CONDUCTORS SHALL BE PROTECTED BY EITHER BUILDING CONSTRUCTION OR CONDUIT TO 8 FEET ABOVE THE FINISHED FLOOR. LOADING DOCKS, GARAGES, SUPPRESSION AND EXTINGUISHING SYSTEM WIRING, MECHANICAL AND ELECTRICAL ROOMS AND OTHER LOCATIONS SUBJECT TO MECHANICAL DAMAGE SHALL BE IN FULL RIGID CONDUIT.
17. FIRE ALARM CABLES SHALL NOT BE MIXED WITH NON FIRE ALARM CABLING. LOW VOLTAGE FIRE ALARM CABLING SHALL NOT BE MIXED OR WIRED NEAR ANY AC CIRCUIT.
18. ALL NOTIFICATION CIRCUITS SHALL BE A MINIMUM OF 14 AWG AND ALL OTHER LOW VOLTAGE FIRE ALARM CIRCUITS SHALL BE 18 AWG MINIMUM.
19. VERTICAL RISER CABLE FOR ALL SYSTEMS THAT INCLUDE STAGED EVACUATION (ANYTHING OTHER THAN A GENERAL ALARM SEQUENCE) SHALL BE A 2 HOUR RATED ASSEMBLY.
20. POLARITY SHALL BE OBSERVED ON ALL CIRCUITS. T-TAPPING SHALL NOT BE ALLOWED ON ANY NOTIFICATION CIRCUITS (HORN, STROBE OR SPEAKER). T-TAPPING SHALL NOT BE PERMITTED ON ADDRESSABLE CIRCUITS WITHOUT THE EXPRESS PERMISSION OF THE ENGINEER.
21. ALL WIRING SHALL BE INSPECTED TO ASSURE THERE ARE NO OPENS, SHORTS OR EARTH GROUNDS.
22. SHIELDED CONDUCTORS OR RUNNING IN SEPARATE RACEWAY SHALL BE AS INSTRUCTED BY THE FIRE ALARM MANUFACTURER'S DOCUMENTATION. ALL NON-POWER LIMITED WIRING, INCLUDING CIRCUITS FOR CENTRALIZED AMPLIFIERS SHALL BE RUN IN A SEPARATE RACEWAY (NOTE: CENTRALIZED AMPLIFIERS "AMP RACKS" ARE NOT PERMITTED ON NEW SYSTEMS).
23. ALL FIRE ALARM CONTROL PANELS SHALL BE GROUNDED USING A MINIMUM #10AWG GREEN THHN OR EQUIVALENT, CONNECTED TO THE BUILDING ELECTRIC SERVICE GROUND BUS. THE GROUND SHALL BE CONTINUED TO ALL OTHER FIRE ALARM EQUIPMENT CABINETS.
24. A CENTRAL STATION DIALER AND TWO DEDICATED PHONE LINES SHALL BE PROVIDED. THE DIALER SHALL BE CAPABLE OF SENDING DEDICATED SIGNALS FOR THE FOLLOWING EVENTS: ALARM, MANUAL STATION, WATERFLOW, SUPERVISORY, TROUBLE, FIRE PUMP RUNNING AND PUMP TROUBLE. IF A SEPARATE CENTRAL STATION DIALER IS PROVIDED (NOT PANEL MOUNTED), INCLUDE SEPARATE FDS.
25. ALL AREA OR DUCT SMOKE DETECTORS SHALL BE PHOTO-ELECTRIC TYPE.
26. SMOKE DETECTORS MUST BE MOUNTED AT LEAST 3 FT AWAY FROM ANY AIR REGISTER.
27. ALL CEILING MOUNT DEVICES MUST BE SECURELY FASTENED TO BUILDING CONSTRUCTION.
28. DEVICE LOCATIONS MUST BE READILY ACCESSIBLE TO ALLOW FOR MAINTENANCE AND REPAIR.
29. DUCT MOUNTED SMOKE DETECTORS SHALL BE MOUNTED ON THE DUCTWORK IN STRICT ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. ALL DUCT DETECTORS SHALL BE PROVIDED WITH A REMOTE LED.
30. MANUAL STATIONS SHALL BE MOUNTED 48 INCHES ABOVE THE FINISHED FLOOR TO THE HANDLE OF THE STATION AND SHALL BE PAINTED FIRE DEPARTMENT RED. ALL MANUAL STATION SHALL BE INSTALLED SO THAT THEY ARE KEPT UN-OBSTRUCTED AT ALL TIMES.
31. NOTIFICATION DEVICES THAT INCLUDE A STROBE SHALL BE MOUNTED 80 INCHES OFF THE FINISHED FLOOR TO THE BOTTOM OF THE STROBE, NOT THE ELECTRICAL BOX.
32. ALL AUXILIARY RELAYS FOR FAN SHUTDOWN, DOOR RELEASE, DAMPER CONTROL, ELEVATOR CONTROL, ETC SHALL BE WIRED A MAXIMUM OF 3 FT FROM THE CONTROLLED DEVICE. THE AUXILIARY RELAY SHALL FUNCTION WITHIN THE REQUIRED VOLTAGE AND CURRENT OF THE CONTROLLED DEVICE. SLAVE OR INTERPOSING RELAYS SHALL BE INCLUDED AND POWERED BY THE FIRE ALARM CONTROL PANEL IN A FAIL-SAFE (FIRE FUNCTION) POSITION. POWER TO THE INTERPOSING RELAY SHALL BE MONITORED BY THE FIRE ALARM SYSTEM.
33. THE FIRE DEPARTMENT SHALL APPROVE THE PLANS PRIOR TO THE BEGINNING OF ANY WORK.
34. LOCATIONS OF ALL FIRE ALARM EQUIPMENT SHALL BE SUBJECT TO THE FIRE DEPARTMENT APPROVAL. NO CHANGE OR MODIFICATION TO THE SYSTEM OR PLANS SHALL BE PERMITTED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER OF RECORD. IF ANY CHANGES ARE MADE TO THE DRAWINGS PRIOR TO OR DURING INSTALLATION, AS BUILT PLANS SHALL BE PREPARED BY THE ENGINEER AND FILED WITH THE APPROPRIATE AGENCIES FOR FINAL ACCEPTANCE.
35. THE CONTRACTOR SHALL RETAIN A NC STATE PE TO SIGN AND SEAL ALL NECESSARY DOCUMENTS REQUIRED FOR INSPECTION AND TO OBTAIN A FINAL LETTER OF APPROVAL. THIS SHALL INCLUDE A SIGNED AND SEALED AS-BUILT DRAWING, STATEMENT OF OPERATION, AN NFPA PROGRAMMING MATRIX. THESE DOCUMENTS SHALL BE SUBMITTED AS NECESSARY TO THE FIRE DEPARTMENT AND DEPARTMENT OF BUILDINGS TO OBTAIN A FIRE ALARM INSPECTION. IF A LETTER OF DEFECT IS ISSUED, THE CONTRACTOR SHALL CORRECT ALL ITEMS AND SUBMIT A SIGNED AND SEALED CORRECTIONS TO THE FIRE DEPARTMENT TO OBTAIN A FINAL LETTER OF APPROVAL AT NO ADDITIONAL COST.
36. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY AND ALL ABANDONED FIRE ALARM CABINETS, DEVICES, AND WIRE. PAINT, PATCH AND CLEANUP SHALL ALSO BE INCLUDED.
37. ALL MANUAL PULL STATIONS SHALL BE FURNISHED WITH PROTECTIVE COVERS WITH LOCAL HORN WITH BATTERY BACKUP. LOCAL HORN SHALL NOT BE CONNECTED TO FIRE ALARM.
38. ALL FIRE ALARM WIRING SHALL BE INSTALLED IN CONDUIT UNLESS CONCEALED IN CEILING AND WALL VOIDS. ALL WIRING SHALL BE UL APPROVED FOR ITS USE AND INSTALLATION.
39. ALL FIRE ALARM SYSTEM JUNCTION BOXES, CABINETS, ENCLOSURES, ETC. MUST BE IDENTIFIED AS PER NFPA 72 AND N.E.C. REQUIREMENTS.
40. SHOP DRAWINGS FOR FIRE ALARM SYSTEMS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL PRIOR TO SYSTEM INSTALLATION, AND SHALL INCLUDE, BUT NOT BE LIMITED TO; ALL OF THE FOLLOWING:
   A. A FLOOR PLAN THAT INDICATES THE USE OF ALL ROOMS.
   B. LOCATIONS OF ALARM-INITIATING DEVICES.
   C. LOCATIONS OF ALARM NOTIFICATION APPLIANCES, INCLUDING CANDELA RATINGS FOR VISIBLE ALARM NOTIFICATION APPLIANCES.
   D. LOCATION OF FIRE ALARM CONTROL UNIT, TRANSPONDERS AND NOTIFICATION POWER SUPPLIES.
   E. ANNUNCIATORS.
   F. POWER CONNECTION.
   G. BATTERY CALCULATIONS.
   H. CONDUCTOR TYPE AND SIZES.
   I. VOLTAGE DROP CALCULATIONS.
   J. MANUFACTURERS' DATA SHEETS INDICATING MODEL NUMBERS AND LISTING INFORMATION FOR EQUIPMENT, DEVICES AND MATERIALS.
   K. DETAILS OF CEILING HEIGHT AND CONSTRUCTION.
   L. THE INTERFACE OF FIRE SAFETY CONTROL FUNCTIONS.
   M. CLASSIFICATION OF THE SUPERVISING STATION.

POWER DISTRIBUTION NOTES

1. UNLESS OTHERWISE NOTED, ALL ELECTRICAL OUTLETS AND EQUIPMENT LOCATED WITHIN AREA DESIGNATED ON ELECTRICAL PLANS SHALL BE CIRCUITED TO ELECTRICAL PANELS LOCATED IN THE SAME AREA. THE ELECTRICAL CONNECTIONS SHALL BE AS FOLLOWS:
   A. APL PANELS:
      - LIGHTING (120V) AND RECEPTACLE OUTLETS.
      - MISCELLANEOUS APPLIANCE LOADS SMALLER THAN 10kVA.
      - MECHANICAL SYSTEM EQUIPMENT RATED FOR 120V OR 208V SYSTEM OPERATION.
   B. PPL PANELS:
      - MISCELLANEOUS APPLIANCE LOADS AND MECHANICAL SYSTEM MOTORS RATED FOR 208V SYSTEM OPERATION.
2. EQUIPMENT INSTALLATION
   A. MOTOR CONTROL EQUIPMENT (MOTOR STARTERS, VFD'S, ETC.) FOR ALL HVAC AND PLUMBING SYSTEMS SHALL BE FURNISHED BY RESPECTIVE TRADE AND INSTALLED AS PART OF ELECTRICAL WORK AS REQUIRED. INCLUDE THIS WORK FOR EACH HVAC AND PLUMBING SYSTEM MOTOR THAT IS NOT A PART OF A PACKAGE SYSTEM. PROVIDE DISCONNECT SWITCH SIZED AS REQUIRED FOR EACH MECHANICAL EQUIPMENT MOTOR UNLESS COMBINATION MOTOR STARTER OR VFD IS PROVIDED AT MOTOR LOCATION.
   B. REFER TO HVAC AND PLUMBING DRAWINGS FOR MORE INFORMATION REGARDING MOTOR CONTROL EQUIPMENT AND ALL MECHANICAL EQUIPMENT EXACT LOCATIONS, TYPES (MOTOR STARTERS OR VFD'S), SIZES AND QUANTITIES.
3. CIRCUITRY GROUND RULES:
   A. PROVIDE CIRCUITRY FOR ALL "NON-STANDARD" WIRING DEVICES (OTHER THAN 20A, 120V OUTLETS) ON THE BASIS OF ONE RECEPTACLE PER CIRCUIT (OVERCURRENT DEVICE IN PANEL SIZED TO MATCH AMPERE RATING OF "NON-STANDARD" WIRING DEVICE WIRED TO THE PANEL AS REQUIRED.
   B. PROVIDE ONE (1) DEDICATED CIRCUIT FOR EACH HVAC AND PLUMBING ITEM (SUPPLY AND EXHAUST FANS, PUMPS RATED FOR 120V OR 208V SYSTEM OPERATION, ELECTRICAL HEATERS, ETC.), SECURITY, IT AND AV EQUIPMENT AND DEVICES. REFER TO HVAC, PLUMBING, SECURITY, IT AND AV DRAWINGS FOR FINAL LOCATIONS, SIZES AND QUANTITIES OF THESE ITEMS. THE CIRCUITS PROVISIONS SHALL BE AS FOLLOWS:
      1) ELECTRICAL LOADS RATED FOR 120V, 1 PH SYSTEM OPERATION:
         - 2#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT.
         - 1P-20A OVERCURRENT PROTECTION DEVICE IN THE NEAREST `APL' PANEL.
      2) ELECTRICAL LOADS RATED FOR 208V, 1 PH SYSTEM OPERATION:
         - 2#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT.
         - 2P-20A OVERCURRENT PROTECTION DEVICE IN THE NEAREST `APL' PANEL.
      3) ELECTRICAL LOADS RATED FOR 208V, 3 PH SYSTEM OPERATION:
         - 3#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT.
         - 3P-20A OVERCURRENT DEVICE IN THE NEAREST `PPL' PANEL.
      4) ELECTRICAL LOADS RATED FOR 208V, 3 PH SYSTEM OPERATION:
         - 3#12 & 1#12G CONDUCTORS IN 3/4" CONDUIT.
         - 3P-20A OVERCURRENT DEVICE IN THE NEAREST `PPL' PANEL.
      5) ALL OTHER LOADS:
         - AS SHOWN ON PANEL SCHEDULES AND/OR AS REQUIRED.
   C. UNLESS OTHERWISE NOTED, EACH 20A CIRCUIT SHALL BE PROVIDED WITH #12 AWG CONDUCTORS (QUANTITIES AS REQUIRED FOR THE CONNECTED LOAD) IN 3/4" CONDUIT (MINIMUM). WIRE SIZE SHALL BE INCREASED AS REQUIRED TO ACCOMMODATE VOLTAGE DROP. VOLTAGE DROP SHALL BE LIMITED TO 2% FOR EACH FEEDER AND 3% FOR BRANCH CIRCUITRY.
   D. PROVIDE ONE (1) 20A, 120V BRANCH CIRCUIT FOR MAXIMUM OF FOUR (4) 20A, 120V COMPUTER RECEPTACLE OUTLETS.
   E. PROVIDE CIRCUITRY FOR CONVENIENCE RECEPTACLES ON THE BASIS OF EIGHT (8) DUPLEX RECEPTACLES PER 20 AMP CIRCUIT WIRED TO THE NEAREST NORMAL LIGHTING AND APPLIANCE PANEL.
   F. PROVIDE DEDICATED 120V, 20A CIRCUIT TO EACH SOLENOID VALVE.
   G. PROVIDE WIRING FROM EACH SOLENOID VALVE TO BMS AND FIRE ALARM PANEL.
4. PROVIDE CABLE SUPPORT BOXES AND PULL BOXES AS REQUIRED. SIZE AS PER ASSOCIATED SECTIONS OF APPLICABLE ELECTRICAL CODE.
5. PROVIDE ALL CONVENIENCE AND SPECIAL DEDICATED OUTLETS, HARDWIRED CONNECTIONS.
6. WITH ALL ASSOCIATED CIRCUITRY AND OVERCURRENT DEVICES AS REQUIRED FOR EACH DEVICE OR EQUIPMENT THAT REQUIRES ELECTRICAL POWER. REFER TO ARCHITECTURAL, MECHANICAL, LOW VOLTAGE SYSTEM SYSTEM INCLUDING SECURITY, IT AND AV, ETC. CONTRACT DOCUMENTS FOR EXACT LOCATIONS, QUANTITIES AND POWER REQUIREMENTS FOR SUCH ITEMS.
7. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS, QUANTITIES, AND MOUNTING HEIGHTS OF ALL ELECTRICAL DEVICES.
8. LOCATING AND ROUTING CIRCUITRY:
   A. ALL CIRCUITRY SHALL BE RUN CONCEALED EXCEPT AS FOLLOWS:
      1) HORIZONTALLY AT THE CEILING OF PERMANENTLY UNFINISHED SPACES WHICH ARE NOT ASSIGNED TO MECHANICAL OR ELECTRICAL EQUIPMENT.
      2) HORIZONTALLY AND VERTICALLY IN MECHANICAL EQUIPMENT SPACES.
      3) HORIZONTALLY AND VERTICALLY IN ELECTRIC EQUIPMENT ROOMS.
      4) WHERE SPECIFICALLY ALLOWED BY THE ARCHITECT AND OWNER.
9. FINAL LOCATIONS OF NEW ELECTRICAL PANELS NOT BEING INSTALLED IN ELECTRICAL SPACES SHALL BE COORDINATED WITH THE ARCHITECT.
10. BRANCH CIRCUIT SIZES AND MAX LENGTHS SHALL COMPLY WITH VOLTAGE DROP REQUIREMENTS AND SATISFY LOADS
11. ALL FREE STANDING ELECTRICAL EQUIPMENT SHALL BE PROVIDED WITH 3" HIGH CONCRETE PAD.
12. MISCELLANEOUS LOW VOLTAGE SYSTEMS:
   A. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING EMPTY CONDUITS, RACEWAYS, BOXES, ETC. FOR VARIOUS LOW VOLTAGE SYSTEMS SUCH AS:
      1) TELECOMMUNICATION
      2) CABLE TV
      3) SECURITY
      4) AUDIO/VISUAL
      5) OTHER SYSTEMS AS REQUIRED.
   B. SPECIFIC REQUIREMENTS OF EACH SYSTEM SHALL BE AS OUTLINED IN RELEVANT LOW VOLTAGE SYSTEM CONTRACT DOCUMENTS.
   C. ALL THE ABOVE SYSTEMS' CENTRAL EQUIPMENT, DEVICES AND VARIOUS COMPONENTS, WIRING AND CONNECTIONS ARE FURNISHED AND INSTALLED SEPARATE FROM ELECTRICAL WORK.
   D. THE CONTRACTOR SHALL PROVIDE ALL POWER CIRCUITRY AS REQUIRED FOR LOW VOLTAGE SYSTEMS' CENTRAL EQUIPMENT AND DEVICES. FINAL LOCATIONS AND POWER REQUIREMENTS FOR THESE ITEMS SHALL BE COORDINATED WITH RESPECTIVE CONSULTANTS.
13. SECURITY AND COMMUNICATION SYSTEM
   A. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR EMPTY CONDUIT ROUGH-IN.
   B. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND INSTALLING ALL 120 VOLT POWER WIRING.
   C. PROVIDE FIRE ALARM SYSTEM TIE-IN WHERE REQUIRED.
   D. THIS CONTRACTOR SHALL CONTACT SYSTEM PROVIDER/VENDOR TO VERIFY HIS FULL SCOPE OF WORK.
   E. PROVIDE JUNCTION BOX WITH BUSHED HOLE COVERPLATE FOR EACH CCTV CAMERA.
   F. PROVIDE ALL REQUIRED OUTLETS AND OUTLET TYPES IN THE TELECOM ROOMS AS PER TELECOMMUNICATION DRAWINGS. SEE `T' SERIES DRAWINGS FOR EXACT SCOPE OF WORK.

LIGHTING NOTES

1. GENERAL:
   A. ELECTRICAL DRAWINGS INDICATE LIGHTING POWER AND CIRCUITING REQUIREMENTS ONLY. LIGHTING LAYOUTS AND LOCATION OF CONTROL DEVICES INCLUDING OCCUPANCY/VACANCY SENSORS SHALL BE AS PER ARCHITECTURAL AND/OR LIGHTING CONSULTANT DRAWINGS.
   B. CONNECT EXIT SIGNS TO A DEDICATED 20A CIRCUIT, ONE CIRCUIT PER FLOOR. PROVIDE ON-POSITION LOCK-OUT ON THE CIRCUIT BREAKER.
   C. LIGHTING FIXTURES IN MORE THAN ONE ROOM OR AREA MAY BE CONNECTED TO THE SAME 20A CIRCUIT.
   D. PROVIDE EMERGENCY BYPASS RELAY FOR EACH GROUP OF EMERGENCY LIGHTS CONTROLLED BY WALL SWITCH SUCH THAT THE SWITCH WILL BE BYPASSED AND EMERGENCY LIGHTS WILL COME ON IN THE EVENT OF FAILURE OF NORMAL POWER.
   E. LIGHTING CONTROL SHALL COMPLY WITH APPLICABLE ENERGY CONSERVATION CODE REQUIREMENTS, INCLUDING DAYLIGHT ZONES. DAYLIGHT ZONE SHALL INCLUDE ANY FIXTURE WITHIN FIFTEEN FEET FROM THE WINDOW. ALL FIXTURES WITHIN DAYLIGHT ZONE SHALL BE SEPARATELY SWITCHED FROM FIXTURES THAT ARE NOT IN THE DAYLIGHT ZONE. COORDINATE THE EXTENT OF DAYLIGHT ZONE WITH LIGHTING CONSULTANT.
   F. OCCUPANCY SENSORS - AUTO 'ON' AND AUTO 'OFF'
      1) LOW VOLTAGE CEILING AND/OR WALL MOUNTED
      2) DUAL TECHNOLOGY (ULTRASOUND, INFRARED) ONLY.
   H. VACANCY SENSOR-MANUAL 'ON' AND AUTO 'OFF'
      1) LOW VOLTAGE CEILING AND/OR WALL MOUNTED
      2) DUAL TECHNOLOGY (ULTRASOUND, INFRARED) ONLY.
      3) PROVIDE IN FOLLOWING SPACES:
         a) CONFERENCE/MEETING ROOM
         b) OFFICES SMALLER THAN 200 S.F. IN AREA.
   I. EMERGENCY LIGHTING FIXTURES SHALL BE FED FROM EMERGENCY CIRCUIT
   J. EMERGENCY FIXTURES NOT REQUIRED OR INTENDED FOR CONTINUOUS OPERATION SHALL BE CONTROLLED BY OCCUPANCY SENSORS WITH MANUAL SWITCH WITH BYPASS RELAY.
   K. NORMAL LIGHTING FIXTURES SHALL BE FED FROM NORMAL POWER CIRCUITS AND SHALL BE CONTROLLED BY A CEILING MOUNTED OCCUPANCY/VACANCY SENSOR. A LOCAL SWITCH AND RELAY PANEL.
   L. ALL SPACES, EXCEPT THOSE INTENDED FOR 24 HOUR OPERATION, OR WHERE AUTOMATIC SHUTOFF WOULD ENDANGER THE SAFETY OF THE OCCUPANTS, MUST HAVE OCCUPANCY SENSORS OR AUTOMATIC BI-LEVEL LIGHTING CONTROLS.
2. OFFICES:
   A. LIGHTING SHALL BE CONTROLLED BY LOCAL WALL MOUNTED SWITCHES AND OCCUPANCY OR VACANCY SENSOR(S).
3. RESTROOMS:
   A. EMERGENCY LIGHTING FIXTURES: MINIMUM TWO LIGHTING FIXTURES IN EACH RESTROOM SHALL BE FED FROM EMERGENCY CIRCUIT AND CONTROLLED BY RELAY PANEL.
   B. NORMAL LIGHTING FIXTURES SHALL BE FED FROM NORMAL POWER CIRCUITS AND SHALL BE CONTROLLED BY A CEILING MOUNTED OCCUPANCY SENSOR, A SWITCH AND RELAY PANEL.
4. MECHANICAL/ELECTRICAL/EQUIPMENT ROOMS:
   A. CONTROL VIA LOCAL MANUAL ON/OFF SWITCH.
   B. CIRCUITS ON LIFE SAFETY PANEL.
5. CORRIDORS, OPEN PUBLIC SPACES:
   A. CONTROLLED VIA CEILING OCCUPANCY SENSORS.
   B. PARTIAL AUTOMATIC ON/AUTOMATIC OFF. LIGHTING POWER OF EACH DESIGNATED LUMINAIRE SHALL DIM TO 50% WHEN NO ACTIVITY IS DETECTED FOR 20-MINUTES
   C. PROVIDE LOCAL OVERRIDE SWITCH.
7. EXIT SIGNS:
   F. EXIT SIGNS SHALL BE FED FROM UNSWITCHED LEG OF THE EMERGENCY CIRCUITS. EXIT SIGNS SHALL NOT BE SWITCHED.
8. CLOSETS/STORAGE ROOM >50 SQFT & <1000 SQFT (VS CONTROLLED)
   A. CONTROLLED VIA WALL VACANCY SENSOR SWITCH OR CEILING OCCUPANCY SENSOR.
   B. MANUAL ON/AUTOMATIC OFF. 20-MINUTES OFF SETTING.
   C. PROVIDE LOCAL OVERRIDE SWITCH.
9. EXTERIOR (TIME CONTROLLED AND PHOTOSENSOR)
   A. CONTROLLED VIA TIME SCHEDULE DEVICE AND PHOTOCELL. SHALL OPERATE AS PHOTOCELL ON AND TIME SCHEDULE OFF. COORDINATE WITH OWNER FOR SCHEDULE.
   B. PROVIDE SYSTEM OVERRIDE SWITCH. MAXIMUM OVERRIDE 2HRS.
10. SAFE AREAS FIXTURE SHALL BE PROVIDED WITH EMERGENCY FIXTURES SHALL (NOT BE SWITCHED) AND SHALL PROVIDE MINIMUM 5 FOOT CANDLES AT THE FLOOR LEVEL, STAIRS, STEPS, RAMPS AND ESCALATORS WITHIN THE SAFE AREA.
11. LIGHTING SYSTEM
   A. PROVIDE LIGHTING FIXTURES, EXIT SIGNS, LIGHT SWITCHES, OCCUPANCY SENSORS, DIMMING SYSTEMS AND OTHER DEVICES AND EQUIPMENT FOR LIGHTING AND LIGHTING CONTROL SYSTEMS AS REQUIRED.
   B. FINAL CONNECTION TO LIGHTING FIXTURES SHALL BE MADE USING 90 DEGREE CELSIUS WIRE. PROVIDE ALL CONDUIT AND WIRE, BOXES CEILING OUTLETS, FIXTURE WHIPS, LIGHTING CONTROL DEVICES AND COVER PLATES REQUIRED TO IMPLEMENT THE CIRCUITING AS REQUIRED.
   C. ALL FLUORESCENT FIXTURES SHALL BE EQUIPPED WITH ENERGY EFFICIENT LAMPS AND ELECTRONIC BALLASTS.
   D. WHERE MORE THAN ONE SWITCH OCCURS IN THE SAME LOCATION, THEY SHALL BE INSTALLED IN A GANG-TYPE BOX UNDER ONE COVER PLATE.
   E. PROVIDE GROUND WIRE WITH ALL FLEXIBLE CONDUIT CONNECTION TO EACH LIGHTING FIXTURE.
   F. REFER TO ARCHITECTURAL DRAWINGS FOR SYMBOLS AND LOCATIONS OF LIGHTING CONTROL DEVICES SUCH AS LIGHTING SWITCHES, OCCUPANCY SENSORS, LIGHT SENSORS, ETC.
   G. REFER TO LIGHTING CONSULTANT AND LIGHTING CONTROL SYSTEM LOAD SCHEDULES FOR INFORMATION REGARDING LIGHTING ZONES.
   H. SEE SPECIFICATIONS FOR LIGHTING FIXTURE DESCRIPTIONS, OPERATING VOLTAGE AND LAMPING.
   I. SEE SPECIFICATIONS FOR LIGHTING CONTROL STRATEGY FOR ALL AREAS.
   J. SEE ARCHITECTURAL REFLECTED CEILING PLANS AND DETAILS TO CONFIRM EXACT LOCATION OF ALL FIXTURES AND MOUNTING.
   K. PROVIDE ONE CENTRAL PHOTOCELL AND RELATED CONTROL PANEL TO CONTROL ALL EXTERIOR LIGHTING.
   L. PROVIDE ALL CONDUIT, WIRE AND BOXES AS WELL AS CEILING OUTLETS AND WHIPS REQUIRED TO ENERGIZE LIGHTING FIXTURES AS SHOWN.
   M. CIRCUIT NUMBERS ARE FOR REFERENCE ONLY AND INDICATE DESIGN INTENT ONLY.
   N. ALL BRANCH CIRCUIT WIRING SHALL BE RUN CONCEALED IN WALLS AND ABOVE HUNG CEILING, U.O.N. FINAL CONNECTIONS TO LIGHTING FIXTURES SHALL BE MADE WITH WIRING HAVING 90°C RATED INSULATION.
   O. LIGHTING FIXTURES USED AS EMERGENCY "NIGHT LIGHT", EMERGENCY LIGHTING IN STAIRS AND EXIT SIGNS SHALL BE UNSWITCHED.
   P. FOR ADDITIONAL LIGHTING INFORMATION SEE ARCHITECTURAL DRAWINGS.
   Q. LIGHTING FIXTURES LOADS CIRCUITED FROM 20A/1P CIRCUIT BREAKER SHALL NOT EXCEED 1500 WATT FOR 120V AND 3000 WATT FOR 277V DISTRIBUTION .
   R. SYMBOLS FOR LIGHTING FIXTURES ARE BASED ON ARCHITECTS DRAWINGS. INCLUDED FOR COORDINATION AND INFORMATION PURPOSES ONLY. REFER TO ARCHITECTS DRAWINGS FOR EXACT TYPE, SYMBOLS, LOCATION AND QUANTITY OF FIXTURES.
   S. PROVIDE DIMMING BALLAST OR COMPATIBLE LED DRIVER FOR ALL LIGHTING FIXTURES REQUIRED TO BE DIMMED.
   T. REFER TO ARCHITECTURAL DRAWINGS FOR FIXTURE INFORMATION RELATED TO LIGHTING. OBTAIN LATEST CONTROL AND LUTRON DRAWINGS AND COORDINATE REQUIRED CIRCUITING.
   U. 80 PERCENT OF LIGHT FIXTURES MUST BE 'ENERGY STAR' QUALIFIED OR HAVE 'ENERGY STAR' QUALIFIED LAMPS INSTALLED.
   V. UNLESS PERMITTED OTHERWISE, ALL SPACES SHALL BE PROVIDED WITH CEILING MOUNTED OCCUPANCY VACANCY SENSORS FOR AUTOMATIC CONTROL AND ASSOCIATED WALL SWITCHES FOR MANUAL OVERRIDE. PROVIDE ONE OCCUPANCY/VACANCY SENSOR PER 400 SQUARE FEET.

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PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL POWER AND LIGHTING NOTES

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
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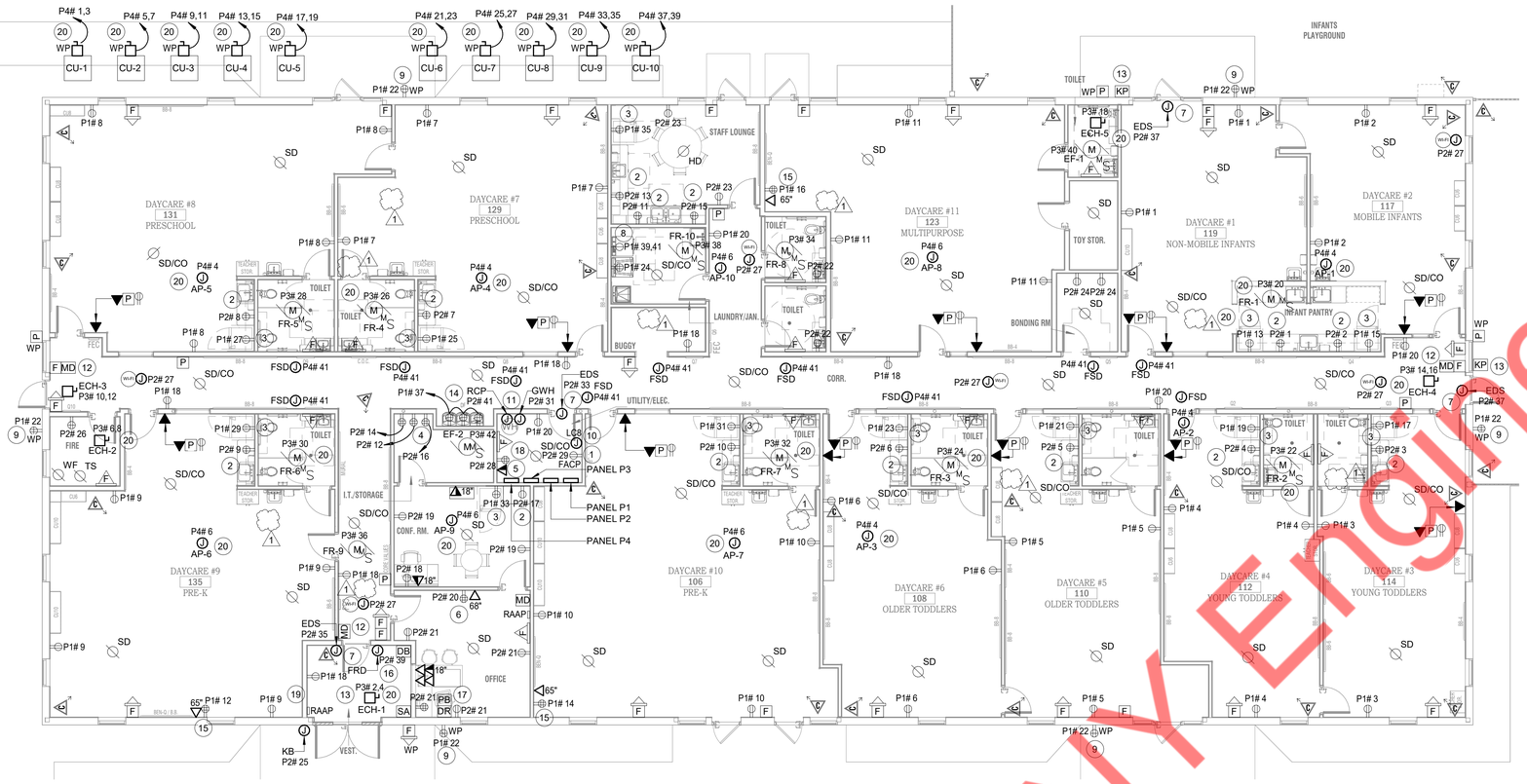

1 ELECTRICAL POWER PLAN
1/8" = 1'-0"

ELECTRICAL POWER PLAN GENERAL NOTES:

1. MOUNTING HEIGHTS FOR WALL OUTLETS AS PER "TYPICAL DEVICE MOUNTING HEIGHTS" TABLE ON ELECTRICAL COVER SHEET AND "TYPICAL MOUNTING HEIGHT DETAIL" ON ELECTRICAL DETAILS SHEET. ANY CHANGES TO OUTLET MOUNTING HEIGHTS SHALL BE COORDINATED WITH OWNER.
2. ALL WIRING/CABLING AND OTHER TELCO/DATA DEVICES SHALL BE PROVIDED BY TELCO/DATA CONTRACTOR. GENERAL CONTRACTOR SHALL VERIFY THE LOCATIONS OF DEVICES AND PROVIDE ROUGH-INS. PROVIDE BACKBOX AND CONDUIT TO ABOVE CEILING IF PARTOTION IS INSULATED. COORDINATE WITH ARCHITECTURAL DRAWINGS.
3. MAXIMUM VOLTAGE DROP FOR FEEDER AND BRANCH CIRCUIT CONDUCTORS COMBINED, SHALL NOT EXCEED A 5% VOLTAGE DROP.
4. PROVIDE SERVICE EQUIPMENT AIC MARKING PER NEC 110.24(A) AND 110.24 (B) FOR MODIFICATIONS IF REQUIRED.
5. RECEPTACLES DESIGNATED WITH A SYMBOL "CP" SHALL BE EQUIPPED WITH A CHILD PROOF COVER PLATE PER NEC 406.12. ALL RECEPTACLES SHALL BE TAMPER RESISTANT.
6. FURNISH AND INSTALL SWITCH RECEPTACLE CONTROL SYSTEM. ALL DUPLEX RECEPTACLES LOCATED IN ALL DAYCARE/OFFICE SHALL CONSIST AT LEAST ONE RECEPTACLE FOR EACH OUTLET TO BE CONTROLLED. COORDINATE WITH OWNER FOR TIME SCHEDULE PROGRAM IN SYSTEM.
7. LANDLORD/CONTRACTOR SHALL PROVIDE AND INSTALL COMPUTER ROUGH-INS IN OFFICE AND CONFERENCE ROOM AS PER THE APPROVED PLANS.
8. CONTRACTOR SHALL COORDINATE DEVICE LOCATIONS & INSTALLATION OF SECURITY SYSTEM WITH LIGHTBRIDGE.
9. TEL/DATA OUTLET SHALL BE LOCATED AT 50" A.F.F.
10. ALL BRANCH CIRCUIT HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO THE PANEL & CIRCUIT NUMBER AS INDICATED.
11. CONTRACTOR TO REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF WHITEBOARDS.
12. ALL RECEPTACLES IN PANTRY AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8 (B). PROVIDE GFI RATED BREAKER AT PANEL FOR KITCHEN EQUIPMENTS.
13. E.C. SHALL VERIFY THE EXACT ELECTRICAL REQUIREMENTS INCLUDING RECEPTACLES, CIRCUIT BREAKER, PLUG, CORD & CABLE FOR ALL KITCHEN/PANTRY EQUIPMENT IN COORDINATION WITH EQUIPMENT SUPPLIER/MANUFACTURER/ARCHITECT /OWNER IN FIELD AND PROVIDE THE ELECTRICAL CONNECTION PER REQUIREMENT. BASE BID ACCORDINGLY.

POWER PLAN ABBREAVIATIONS:

KB	KNOX BOX
EDS	ELECTRIC DOOR STRIKE
FRD	FACIAL RECOGINATION DEVICE
RAAP	REMOTE ALARM ANNUNCIATOR PANEL
KP	KEYPAD
MD	MOTION DETECTOR
FACP	FIRE ALARM CONTROL PANEL
GWH	GAS WATER HEATER
RCP	RECIRCULATION PUMP
DR	DOOR RELEASE
PB	PANIC BUTTON
DB	DOOR BELL
MD	MOTION DETECTOR
WA	WASHER
DR	DRYER

ELECTRICAL POWER PLAN KEY NOTES:

1. APPROXIMATE LOCATION OF FIRE ALARM CONTROL PANEL. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER/FIRE MARSHAL.
2. COUNTER-TOP RECEPTACLE TO BE MOUNTED 42" AFF AFF TO CENTER. E.C. SHALL COORDINATE WITH ARCHITETC/ONWER FOR FINAL LOCATION AND MOUNTING DETAILS OF THE SAME.
3. RECEPTACLE FOR REFRIGERATOR TO BE MOUNTED AT 18" AFF. E.C. SHALL COORDINATE WITH ARCHITETC/ONWER FOR FINAL LOCATION AND MOUNTING DETAILS OF THE SAME.
4. COORDINATE COMPUTER/SERVER CLOSET REQUIREMENTS WITH IT VENDOR. (3) QUAD RECEPTACLES MOUNTED AT 48" AFF. EQUIPMENT SHALL BE MOUNTED ON FULL WALL FIRE RATED BACK BOARD.
5. FULL WALL FIRE RATED PLYWOOD BACKBOARD. MOUNT BLACKBOX UNIT AND ACCESSORIES ON BACKBOARD. (2) 4" CONDUITS FOR TELEPHONE SERVICE AT TENANT'S TEL/DATA BACKBOARD. COORDINATE REQUIREMENTS WITH LOCAL TELEPHONE DISTRIBUTION BOARD. MAINTAIN REQUIRED CLEARANCES.
6. REFER TO WATCHMEGROW TV SETUP DETAIL ON E-404 FOR INSTALLATION REQUIREMENTS.
7. PROVIDE 120V CIRCUIT FOR ACCESS CONTROL PANEL FOR ELECTRIC DOOR STRIKE SYSTEM. REFER TO PANEL SCHEDULE FOR CIRCUITING. DOOR STRIKE LOCATIONS AS SHOWN ON PLAN.
8. COORDINATE EXACT ELECTRICAL REQUIREMENTS AND RECEPTACLE TYPE FOR WASHER/DRYER WITH MANUFACTURER PRIOR TO BID AND INSTALLATION.
9. COORDINATE EXACT ELECTRICAL REQUIREMENTS AND RECEPTACLE TYPE FOR EXTERIOR OULETS WITH MANUFACTURER PRIOR TO BID AND INSTALLATION.
10. E.C. SHALL FURNISH AND INSTALL LIGHTING RELAY PANEL (WATTSTOPPER LC8 OR APPROVED EQUAL). REFER TO ELECTRICAL DETAILS SHEET FOR FURTHER REQUIREMENTS.
11. POWER FOR WATER HEATER AND RECIRC. PUMP. COORDINATE EXACT CONTROL REQUIREMENTS WITH PLUMBING CONTRACTOR/EQUIPMENT MANUFACTURER PRIOR TO BID AND INSTALLATION.
12. CONTRACTOR SHALL FIELD VERIFY FINAL LOCATION FOR ALL MOTION DETECTOR SYSTEMS PRIOR TO INSTALLATION.
13. CONTRACTOR SHALL FIELD VERIFY FINAL MOUNTING HEIGHT AND LOCATION OF KEYPAD TO BE INSTALLED AT DOORS PRIOR TO BID AND INSTALLATION.
14. EC TO COORDINATE EXACT REQUIREMENTS FOR DRINKING FOUNTAIN WITH MANUFACTURER PRIOR TO BID AND INSTALLATION.
15. REFER TO INTERACTIVE WHITEBOARD DETAIL ON SHEET E-404 AND DRAWING G103 FOR INSTALLATION REQUIREMENTS.
16. J-BOX FOR POWER FOR FACIAL RECOGNITION SYSTEM IN THE WALL. REFER TO DRAWING A-101 FOR PLACEMENT DETAIL, AND E-404 FOR FURTHER DETAILS. COORDINATE EXACT REQUIREMENTS WITH LOW VOLTAGE SYSTEM CONSULTANT.
17. CONTRACTOR SHALL FIELD VERIFY FINAL MOUNTING LOCATION OF DOOR RELEASE/PANIC BUTTON, MOUNTING HEIGHT SHALL BE 48" AFF.
18. ALL EQUIPMENT SHALL BE MOUNTED ON FIRE RATED PLYWOOD BACKBOARD IN THIS ROOM.
19. E.C. SHALL COORDINATE FINAL LOCATION OF DOOR BELL WITH ARCHITECT/OWENR IN FIELD. COORDINATE MODEL/MAKE WITH ARCHITECT/OWNER.
20. E.C. TO COORDINATE WITH MECHANICAL CONTRACTOR/EQUIPMENT MANUFACTURER FOR POWER REQUIREMENT OF NEW MECHANICAL UNITS PRIOR TO BID AND INSTALLATION.

ELECTRICAL GENERAL REQUIREMENTS:

TELEPHONE:
1. CONTRACTOR SHALL PROVIDE AND INSTALL TELEPHONE CABLES AT LOCATIONS SHOWN ON PLANS.
2. CONTRACTOR SHALL TERMINATE ALL CABLING TO I.T. CLOSET AND PROVIDE ALL JACKS & PLATES.

RECEPTACLES:
1. ALL RECEPTACLES SHALL BE TAMPER RESISTANT AS MANUFACTURED BY "PASS & SEYMOUR". CHILD PROOF GFCI RECEPTACLE.

PANEL BOARDS:
1. CIRCUIT BREAKERS SHALL HAVE A COMMON TRIP ON ALL MULTI-POLE BREAKERS AND CONTRACTOR TO PROVIDE LABELING.
2. BUS AND HARDWARE SHALL BE BRACED FOR INTERRUPTING CAPACITY AS SHOWN ON PANEL BOARD SCHEDULE. BREAKERS SHALL MATCH AIC RATING OF PANEL AT PANEL VOLTAGE. ALL BUSSING SHALL BE COPPER.
3. PROVIDE EACH PANEL BOARD WITH GREEN CODED GROUND BAR, FOR GREEN EQUIPMENT GROUND WIRES. EACH BAR TO HAVE A MINIMUM CAPACITY FOR THE NUMBER OF POLES IN PANEL WITH SOLDER-LESS. BOX LUGS FOR WIRE SIZE NO. 12 MINIMUM TO NO. 4 MAXIMUM. ONE WIRE PER LUG. LOCATE BAR ADJACENT TO NEUTRAL BAR BOLT OR WELD TO BACK BOX.
4. MAIN CIRCUIT BREAKERS & SWITCH BOARDS WHERE REQUIRED, MUST BE APPROVED BY LOCAL UTILITY.

RECEPTACLES CONTINUED:
5. PROVIDE 208Y/120V PANEL-BOARDS WITH AN ISOLATED NEUTRAL BAR. THERE SHALL BE AS MANY TERMINALS AS THERE ARE CIRCUIT POLES. THE TERMINAL FOR THE FEEDER NEUTRAL SHALL MATCH THE SIZE OF THE FEEDER PHASE TERMINATION(S).
6. CONTRACTOR SHALL LABEL ALL CIRCUIT BREAKERS.
7. CONTRACTOR SHALL INSTALL ALL DISTRIBUTION DEVICES, INCLUDING J-BOXES. SWITCHES AND RECEPTACLES PER LOCAL BUILDING CODES AND THE APPROVED PLANS. EACH CLASSROOM LIGHTING SYSTEM SHALL BE SEPARATELY SWITCHED AND THE LOCATION OF LIGHT SWITCHES SHALL BE CONVENIENT TO THE ENTRANCE OF EACH CLASSROOM, SHARED TOILET BETWEEN CLASSROOMS SHALL BE SWITCHED FOR THREE WAY OPERATIONS.

OUTLET BOXES:
1. GALVANIZED STAMPED STEEL FOR ALL INTERIOR LOCATIONS. MOUNT ALL BOXES SO THAT COVERS AND PLATES WILL MOUNT FLUSH WITH THE WALL AND CEILING FINISH SURFACE. PROVIDED PLASTER RINGS AS NECESSARY. GOOF RINGS ARE ACCEPTABLE.
2. SUITABLE GALVANIZED BARS, ROD GANGERS OR CADDY CLIPS SHALL BE USED THROUGHOUT THE WORK. WOODEN SUPPORTS, STRIPES, TIE WIRES, OR MAKESHIFT DEVICES SHALL NOT BE USED.
3. BOXES SHALL NOT BE LESS THAN 1 DEEP. IN GENERAL OUTLET BOXES SHALL BE OF SUFFICIENT DEPTH SO THAT CONDUIT ENTERING WITHIN TILE WALLS NEED NOT BE OFFSET SO THAT TILES HAVE TO BE CHIPPED OR ALTERED. ALL BOXES SHALL BE SET LEVEL AND PLUMB.
4. PROVIDE RAIN TIGHT CAST METAL BOXES WITH THREADED CONDUIT HOLES AND CAST METAL FACE PLATES, COVERS SHALL MAINTAIN RATING WHILE IN USE.
5. REFER TO "TYPICAL DEVICE MOUNTING HEIGHTS" TABLE ON ELECTRICAL COVER SHEET AND "TYPICAL MOUNTING HEIGHT DETAIL" ON ELECTRICAL DETAILS SHEET FOR MOUNTING HEIGHTS. ANY CHANGES TO OUTLET MOUNTING HEIGHTS SHALL BE COORDINATED WITH OWNER.
6. WHEN INSTALLED (IN MASONRY WALLS), LOCATE BOTTOM OF BOX AT NEAREST MASONRY JOINT TO DIMENSION INDICATED. WHERE OUTLETS OCCUR ABOVE COUNTERS, OR CABINETS, CORRELATE HEIGHT OF OUTLET WITH EQUIPMENT SO DEVICE WILL CLEAR ALL TRIM.
7. ALL RECEPTACLE AND SWITCH PLATES SHALL BE WHITE.

SAFETY SWITCHES:
1. SAFETY SWITCHES, FUSIBLE HEAVY DUTY.

METER CENTER:
1. WHERE REQUIRED, METER MUST BE APPROVED BY LOCAL UTILITY.

WIRING DEVICES:
1. PROVIDE SPECIFICATION GRADE WIRING DEVICES OF 20 AMP RATING MINIMUM. AS REQUIRED ON THE PLANS. SWITCHES SHALL BE QUIET TYPE.
2. SWITCHES, WHERE REQUIRED SHALL BE MOUNTED ON THE STRIKE SIDE OF DOORS AS FINALLY HUNG.
3. DEVICES SHALL HAVE SMOOTH NYLON PLATE-FIT & TYPE AS REQUIRED BY DEVICE. OUTLETS WITHOUT DEVICES. EXCEPT TELEPHONE, TO HAVE BLANK PLATES. FASTEN PLATES IN PLACE BY OVAL, HEAD, SCREWS MATCHING PLATE.

PUBLIC ANNOUNCEMENT SYSTEM:
1. PUBLIC ANNOUNCEMENT SYSTEM SHALL BE WIRED FOR THE FOLLOWING ZONES:
A. ZONE 1-CLASSROOMS
B. ZONE 2-CORRIDOR
C. ZONE 3-PLAYGROUND
D. ZONE 4 - MULTI-PURPOSE ROOM
2. CONTRACTOR IS RESPONSIBLE FOR FULL SYSTEM INCLUDING ALL WIRING . TERMINATIONS, PLUGS, PLATES AND MATERIALS.

VOICE/DATA, TELEPHONE, CCTV, SECURITY:
1. SEE PROJECT MANUAL FOR SPECIFICATIONS.
2. GC'S LOW-VOLTAGE (VOICE/DATA, TELEPHONE, CCTV, SECURITY) CONTRACTOR TO PROVIDE WIRING, TERMIANTION, PLUGS, PLATES, & MATERIALS NEEDED TO PROVIDED A FULLY FUNCTIONING SYSTEM.
3. CONTRACTOR SHALL TERMINATE ALL CABLING TO I.T. CLOSET.

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Lightbridge Academy℠
Innovators in Educational Child Care

PROJECT

LIGHTBRIDGE ACADEMY

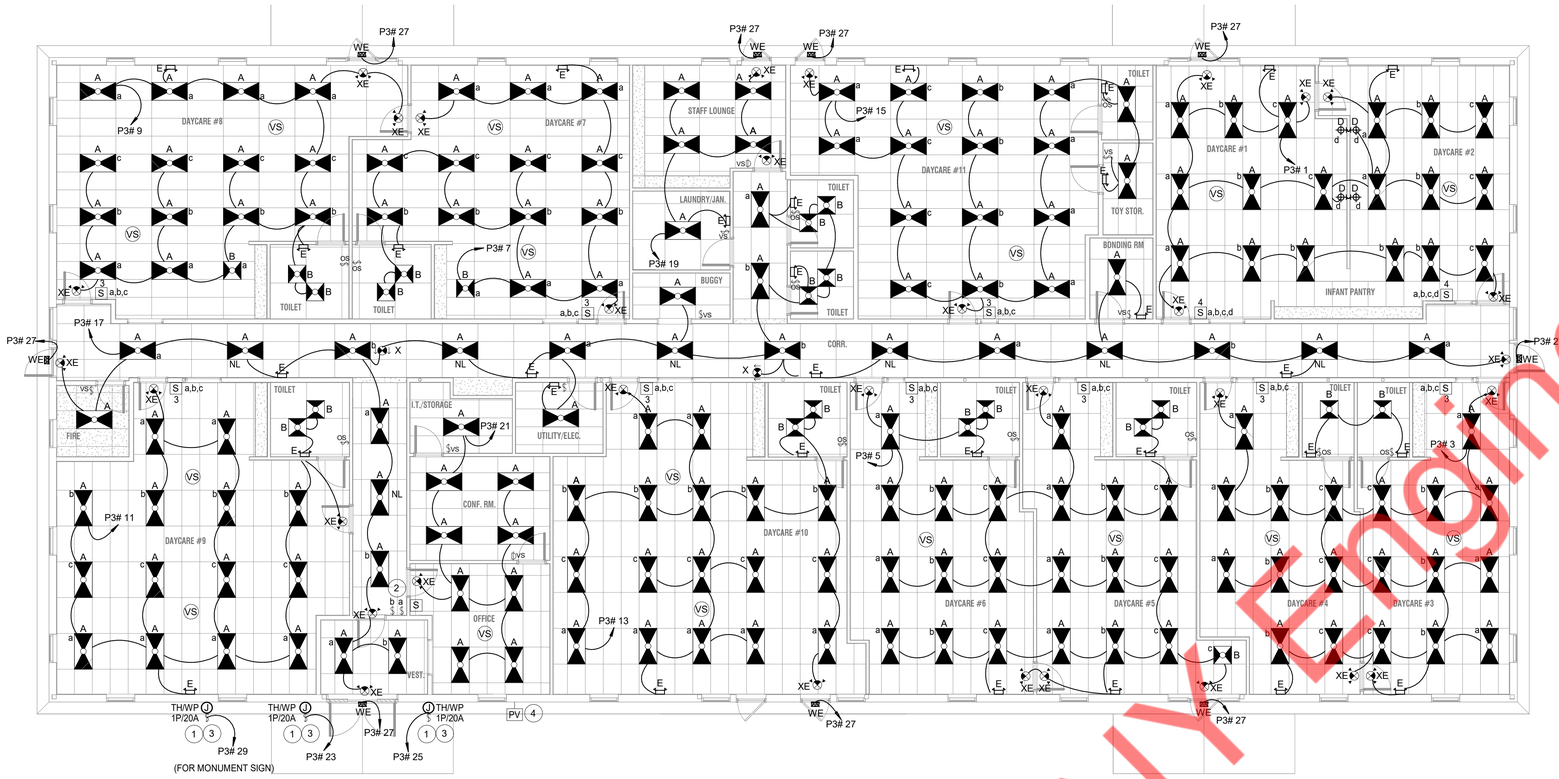
SHEET TITLE:

ELECTRICAL POWER PLAN

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT
1	11/12/2024	BLDG. DEPT. RESPONSES

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
E-101



1 ELECTRICAL LIGHTING PLAN
1/8" = 1'-0"

ELECTRICAL LIGHTING GENERAL NOTES:

1. CONTRACTOR SHALL ADJUST THE EMERGENCY AND EXIT LIGHTING QUATITIES/LOCATION AS REQUIRED TO MEET THE LOCAL AHJ REQUIREMENTS.BASE BID ACCORDINGLY.
2. PROVIDE AN UN-SWITCHED HOT LEG TO ALL NIGHT LIGHT, EMERGENCY AND EXIT FIXTURES.
3. CONTRACTOR SHALL PROVIDE THE LIGHTING CONTROLS AND ALL REQUIRED DEVICES/ACCESSORIES/WIRING AS PER IECC 2015 CODE REQUIREMENTS.
4. PROVIDE AN UN-SWITCH HOT LEG TO ALL EMERGENCY AND EXIT FIXTURES.
5. ANY ACCESS/MAINTENANCE DOORS IN CEILING SHALL NOT BE BLOCKED BY ANY DUCT, PIPES, ELECTRICAL CONDUITS/WIRES, OR OTHER HARD TO REMOVE OBJECTS. AT LEAST ONE SWITCH SHALL BE LOCATED AT THE USUAL POINT OF ENTRY AND EXIT OR AS REQUIRED BY CODE.
6. CONTRACTOR SHALL LOCATE VACANCY SENSOR WITH OVERRIDE WALL SWITCH AT HEIGHT AND LOCATION BEST SUITED FOR OPTIMUM PERFORMANCE. COORDINATE WITH ARCHITECT PRIOR TO ROUGH-IN.
7. ALL LIGHTING FIXTURE TYPES AND LAYOUTS TO BE VERIFIED WITH ARCHITECT/OWNER.FOR EXACT LOCATION AND MOUNTING HEIGHTS OF ALL LIGHTING FIXTURES SWITCHES AND JUNCTION BOXES, SEE ARCHITECTURAL DRAWINGS.
8. EACH SPACE THAT IS ENCLOSED BY CEILING-HEIGHT PARTITIONS MUST HAVE AT LEAST ONE CONTROL DEVICE THAT INDEPENDENTLY CONTROLS THE GENERAL LIGHTING IN THE SPACE. EACH CLASSROOM LIGHTING SYSTEM SHALL BE SEPARATELY SWITCHED AND THE LOCATIONS OF LIGHT SWITCHES SHALL BE CONVENIENT TO THE ENTRANCE OF EACH CLASSROOM, SHARED TOILET BETWEEN CLASSROOMS SHALL BE SWITCHED FOR THREE WAY OPERATION.

ELECTRICAL LIGHTING KEY NOTES:

1. EXTERIOR LIGHTING AND/OR SIGNAGE SHALL BE CONTROLLED VIA PHOTOCELL AND ALSO TIME SCHEDULE. SIGNAGE LIGHTING MUST BE SHUT OFF FROM THE HOURS OF MIDNIGHT TO 6AM. COORDINATE EXACT LOCATION OF EXTERIOR SIGNAGE PRIOR TO BID AND INSTALLATION.
2. EC TO FURNISH AND INSTALL MOMENTARY SWITCHES (WATTSTOPPER DCC2 W/BZ-150 POWERPACK OR APPROVED EQUAL) FOR CORRIDOR LIGHTING.
3. COORDINATE EXACT LOCATION/QUANTITY OF SIGNAGE & EXTERIOR LIGHTING WITH ARCHITECT/OWNER PRIOR TO INSTALLATION.
4. COORDINATE EXACT LOCATION OF PHOTOCELL WITH ARCHITECT/OWNER PRIOR TO INSTALLATION.

LIGHTING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	MANF.	MODEL	LAMPS NO.	LAMPS TYPE	VOLTS	WATTS	MOUNTING	REMARKS
A	2X4 LED RECESSED TROFFER LIGHT FIXTURE	LITHONIA LIGHTING	2BLT4-30L-ADP-120-MP850	1	LED	120V	30W	RECESSED	FIXTURES TAGGED WITH "NL" SHALL BE WIRED AS A NIGHT LIGHT.
B	2X2 LED RECESSED TROFFER LIGHT FIXTURE	LITHONIA LIGHTING	2BLT2-33L-ADP-120-MP850	1	LED	120V	30W	RECESSED	FIXTURES TAGGED WITH "NL" SHALL BE WIRED AS A NIGHT LIGHT.
	EXTERIOR SURFACE MOUNTED UP/DOWN WALL FIXTURE	PROGRESS LIGHTING	P5675-20/30K	2	LED	120V	34W	WALL	COORDINATE MTG. HT. WITH ARCHITECT. PROVIDE COVER LENS.
XE	COMBINATION EXIT AND EMERGENCY LED LIGHTING FIXTURE	LITHONIA LIGHTING	ECR-LED-M6	2	LED	120-277V	4.3	SURFACE	PROVIDE 90 MINUTE BATTERY BACK UP
X	LED EXIT SIGN	LITHONIA LIGHTING	EXR-LED-M6	N/A	LED	120-277V	3.3	SURFACE	ARROWS DENOTE DIRECTIONAL FIXTURE AS NEEDED.PROVIDE 90 MINUTE BATTERY BACK UP
WE	EXTERIOR EMERGENCY FIXTURE	LITHONIA LIGHTING	AFF-OEL-UVOLT-LTP-FCT-CW	1	LED	120-277V	15W	SURFACE	PROVIDE 90 MINUTE BATTERY BACK UP WITH COLD WEATHER OPTION.
D	INTERIOR SURFACE MOUNTED WALL FIXTURE	KICHLER SHAILENE	45572OZ	1	LED	120V	10W	WALL	USE 60W MAX LED EQUIVALENT BULB. 2700K. TO BE MOUNTED AT 72" AFF. OLDE BRONZE FINISH.
	6" RECESSED DOWNLIGHT	PRESCOLITE	LF6LEDG4-6LFLED6G435KWT	1	LED	120-277V	19.1	RECESSED	FIXTURES SPECIFIED WITH "EM" SHALL BE FURNISHED WITH EMERGENCY BATTERY PACK OPTION.
E	EMERGENCY LED LIGHTING FIXTURE	LITHONIA LIGHTING	ELM6L LTP LED	2	LED	120-277V	10.6	SURFACE	PROVIDE 90 MINUTE BATTERY BACK UP
	JELLY JAR FIXTURE (WEATHERPROOF)	LITHONIA LIGHTING	OLVTWM	1	LED	120-277V	15W	WALL	PROVIDE RED GLOBE FIXTURE
	4' GENERAL PURPOSE STRIP LIGHT	COLUMBIA	MPS4-40ML-CW-EDU	-	LED	120-277V	40.1	SURFACE	-

LIGHTING CONTROL NARRATIVE

OPEN AREAS/CORRIDORS (OCCUPANCY SENSOR CONTROLLED):

1. CONTROLLED VIA OCCUPANCY SENSORS.
2. AUTOMATIC ON/AUTOMATIC OFF. 20-MINUTE OFF SETTING PROVIDE LOCAL OVERRIDE SWITCH

CLASSROOMS/CLOSETS/STORAGE/OFFICE (VACANCY SENSOR CONTROLLED):
1. CONTROLLED VIA OCCUPANCY SENSORS IN VACANCY MODE.
2. MANUAL ON/AUTOMATIC OFF. 20-MINUTE OFF SETTING
3. PROVIDE LOCAL OVERRIDE SWITCH.

RESTROOMS (OCCUPANCY SENSOR CONTROLLED):
1. CONTROLLED VIA OCCUPANCY SENSORS.
2. AUTOMATIC ON/AUTOMATIC OFF. 20-MINUTE OFF SETTING PROVIDE LOCAL OVERRIDE SWITCH

UTILITY ROOMS (MANUALLY ON/OFF):
1. CONTROLLED VIA LOCAL MANUAL ON/OFF SWITCH.

NOTE:
E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR FINAL LIGHTING CONTROL REQUIREMENTS AND PROVIDE ALL LIGHTING CONTROLS IN COMPLIANCE WITH IECC-2018 CODE AND ACCORDINGLY PROVIDE REQUIRED DEVICES, ACCESORIES, WIRING WITH NO ADDITIONAL COST FOR PROPER FUNCTIONING AND OPERATION OF LIGHTING SYSTEM.

ADDITIONAL LIGHTING COORINATION NOTE:

THE NUMBER OF LIGHTING ZONES IN EACH CLASSROOM CORRESPONDS THE NUMBER OF BZ-150 POWERPACKS REQUIRED PER CLASSROOM. POWERPACKS TO BE PLACED ABOVE CEILING IN CLASSROOMS. REFER TO LIGHTING CONTROL DIAGRAM ON DRAWING E-403 FOR FURTHER COORDINATION AND DEVICES REQUIRED

LIGHTING FIXTURE SCHEDULE GENERAL NOTES:

1. FIXTURES RATED FOR A HIGHER MAXIMUM WATTAGE SHALL BE FURNISHED WITH A CUSTOM MAXIMUM WATTAGE LABEL FROM THE MANUFACTURER. THE LABEL SHALL LIST THE MAXIMUM WATTAGE SHOWN IN THIS FIXTURE SCHEDULE.
2. REFER TO ARCHITECTURAL DRAWINGS FOR FINAL LIGHTING FIXTURE SCHEDULES AND EXACT FIXTURE LOCATIONS.
3. ALL COLOURS, TRIMS, AND FINISH SHALL BE APPROVED BY ARCHITECT.

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PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL LIGHTING PLAN

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
E-201

ELECTRICAL SPECIFICATIONS

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS.THE CONTRACTOR SHALL ALLOW IN THEIR PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.

C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION,MAINTANANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWING MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

E. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.

F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK.CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.

G. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.

H. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.

I. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.

J. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS.REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

L. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

M. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

O. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, EMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

1. "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
2. "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
3. "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE,AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
4. "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
5. "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.
6. "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION,INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
7. "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
8. "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING HOURS. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.

C. QUALITY ASSURANCE

1. QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
2. GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.
3. HEIGHTS OF OUTLETS:
   a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
      - RECEPTACLES AND TELEPHONES: 1 FT-6 IN.
      - WALL SWITCHES: 4 FT-0 IN.
      - WALL FIXTURES: 7 FT-0 IN.
      - MOTOR CONTROLLERS: 5 FT-0 IN.
      - CLOCKS: 7 FT 6 IN
   b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.
   c. REFER TO ARCHITECTURAL AND/OR INTERIOR DESIGNER'S PLANS FOR DEVICE HEIGHTS IN NON BOH SPACES

D. PRODUCT DELIVERY, STORAGE AND HANDLING

1. MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
2. ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

1. NAMEPLATES: PROVIDE BLACK LAMACOID SHEET WITH 3/4 IN.WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL,CABINET,TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE.NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.
2. CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.
3. INSERTS AND SUPPORTS:
   a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
      - SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
      - MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
      - CLIP FORM NAILS FLUSH WITH INSERTS.
      - MAXIMUM LOADING 75 PERCENT OF RATING.
   b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY),CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.
   c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
   d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

H. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

I. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE 2017 NATIONAL ELECTRICAL CODE (NEC) AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THIS CONTRACT UNLESS OTHERWISE AMENDED,MODIFIED, SUPPLIED OR SPECIFIED HEREIN.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE-2015 EDITION. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

1. PROJECT NAME AND LOCATION
2. NAME OF ARCHITECT AND ENGINEER
3. ITEM IDENTIFICATION
4. APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1. SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
2. SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1. SAFETY/DISCONNECT SWITCHES
2. FUSES
3. CIRCUIT BREAKERS
4. PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).
5. RACEWAYS
6. WIRE AND CABLE
7. WALL SWITCHES
8. INSERTION RECEPTACLES
9. MOMENTARY CONTACT SWITCHES
10. TIME SWITCHES
11. LIGHTING FIXTURES.

E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT,CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC GMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

7. FUSES:

A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

B. MOTOR CIRCUITS - ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.

D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL- MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

1. 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.
2. 120/240 VOLTS, 225-AMP FRAME: 22,000 AMPS MINIMUM

8. DISTRIBUTION PANELBOARDS, CIRCUIT BREAKER TYPE:

A. THREE PHASE, 4 OR 5 WIRE, COPPER BUS BARS, WITH 2, 3, OR 4 WIRE BRANCHES, AS NOTED. CAPACITY OF PANEL AND CIRCUITS, AS NOTED BELOW. PANELBOARD TO HAVE GROUND BUS SAME SIZE AS PHASE BUSES.

B. CABINETS: CODE GAUGE GALVANIZED SHEET STEEL PRIMED AND PAINTED WITH TRIM AND DOOR, TYPE AS NOTED, LAP AND RIVET CORNERS OR FORM AS APPROVED.

C. TRIM: ONE PIECE FULL FINISH PRIMED AND PAINTED SHEET STEEL. TRIM SHALL BE MOUNTED WITH A CONTINUOUS PIANO HINGE CONFIGURED IN SUCH A MANINER THAT IT SHALL BE POSSIBLE TO GAIN FULL ACCESS TO CIRCUIT BREAKERS AND WIRING GUTTERS WITHOUT REMOVING THE TRIM. PROVIDE A MULTI-PIN CYLINDER LOCK (YALE, CORBIN OR EQUAL) TO LATCH THE TRIM. KEYS SHALL BE MILLED.

D. HARDWARE: MULTI-PIN, CYLINDER LOCKS WITH MILLED KEYS. ALL PANELS SHALL BE KEYED ALIKE. DOOR OVER 48" HIGH SHALL BE EQUIPPED WITH A CHROME PLATED VAULT HANDLE, BUILT-IN LOCK AND 3-POINT CATCH FASTENING DOOR AT TOP, BOTTOM AND CENTER.

E. HINGES: CONCEALED, CONTINUOUS PIANO HINGE AS DESCRIBED ABOVE.

F. DIRECTORY HOLDER: MEAL FRAME WITH NONBREAKABLE TRANSPARENT COVER AND DIRECTORY CARD. ENTRIES TO BE TYPEWRITTEN BY ELECTRICAL CONTRACTOR. PROVIDE AN ENGRAVED LAMINATED NAMEPLATE ADJACENT TO EACH BRANCH BREAKER. MOUNT WITH SELF TAPPING MACHINE SCREWS.

G. FURNISH MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING NOT PERMITTED. SECURE LUGS TO BUS BY STUD BOLTS.

H. PANELBOARD CONSTRUCTION FOR BOLTED TYPE BREAKERS. MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, RMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. INDIVIDUAL CIRCUIT BREAKERS SHALL HAVE MINIMUM 100A FRAME, TRIPS SIZED AS SHOW ON THE PLANS.

I. MINIMUM GUTTER SPACES: PANELS WITH 225 AMPERE MAINS, 5-¾" MINIMUM, 400 AMPERES AND OVER, MINIMUM GUTTERS 8". FOR PANELS WITH THROUGH FEEDERS, INCREASE GUTTER WIDTH BY 2" MINIMUM AND PROVIDE A SHEET STEEL BARRIER BETWEEN THE PANEL GUTTER AND THE THROUGH FEEDER PORTION OF THE BACK BOX. BRANCH CIRCUIT BREAKERS SHALL BE MECHANICALLY INTERLOCKED WHEN SHOWN ON DRAWINGS.

J. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

9. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.

B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS, COVERS TO BE PAD-LOCKABLE.

C. PANELBOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.

D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).

E. DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.

F. DISCONNECTS

1. DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.
2. SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANICALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.
3. SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.
4. SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1. DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

1. PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.
2. NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼" HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "OMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

B. MATERIALS

1. RACEWAYS:
   a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED.
   b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.
   c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.
   d. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
   e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
2. FITTINGS AND ACCESSORIES:
   a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.
   b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.
   c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.
   d. BUSHINGS: METALLIC INSULATED TYPE.

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Lightbridge Academy℠
Innovators in Educational Child Care

PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL SPECIFICATIONS (1 OF 2)

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
E-301

ELECTRICAL SPECIFICATIONS (CONT.)

3. BOXES:
   a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.

   b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 277/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.

C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB FOR THROUGH-THE-FLOOR SYSTEMS. UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED. EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS.FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL, FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR, MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

D. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTIURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.

INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN TABLE 300.19(A).

E. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

F. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

G. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.

PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

11. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).

E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. WHEN USED IN LIEU OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF HOSPITAL GRADE 'BX'.

F. METAL-CLAD CABLE, NFPA 70 ARTICLE 330 TYPE MC:

1. INTERLOCKED FLEXIBLE GALVANIZED STEEL ARMOR SHEATH, CONFORMING TO UL REQUIREMENTS FOR TYPE MC METAL CLAD CABLE.
2. INSULATED COPPER CONDUCTORS, SUITABLE FOR 600 VOLTS, RATED 90°C, ONE OF THE TYPES LISTED IN NFPA 70 TABLE 310.13(A) OR OF A TYPE IDENTIFIED FOR USE IN TYPE MC CABLE.
3. INTERNAL FULL SIZE COPPER GROUND CONDUCTOR WITH GREEN INSULATION.
4. ACCEPTABLE COMPANIES: AFC CABLE SYSTEMS INC., SOUTHWIRE, GENERAL CABLE.
5. CONNECTORS FOR MC CABLE: AFC FITTING INC.'S AFC SERIES, ARLINGTON INDUSTRIES INC.'S SADDLE GRIP, OR THOMAS & BETTS CO.'S TITE-BITE WITH ANTI-SHORT BUSHINGS.

G. COLOR CODING SHALL BE AS FOLLOWS:

120/208 VOLT SYSTEM:	277/480 VOLT SYSTEM:
BLACK FOR A PHASE	BROWN FOR A PHASE
RED FOR B PHASE	ORANGE FOR C PHASE
BLUE FOR C PHASE	YELLOW FOR C PHASE

1. NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.

WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

H. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.

I. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

J. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 277/480 VOLT SYSTEMS, EXCEPT 480 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

K. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.

L. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

M. PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.

12. WIRING DEVICES:

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).

C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.

1. SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING, 15A, 125V, NEMA 5-20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
2. USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE: TAMPER RESISTANT,

D. INSERTION RECEPTACLES SHALL BE HOSPITAL GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT. GROUNDED, EXCEPT AS NOTED.

1. HEALTH CARE FACILITIES:
   a. DUPLEX, 20 AMP, 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8300 HOSPITAL GRADE.
   b. SINGLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8310 HOSPITAL GRADE.
2. GROUND FAULT INTERRUPTER RECEPTACLES:
   a. 20 AMP DUPLEX FEED-THROUGH TYPE. SIMILAR TO NO. GF8300.

E. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

F. COLORS: COORDINATE COLORS WITH ARCHITECT.

G. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

13. LIGHTING FIXTURES:

A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.

E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.

F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.

G. FLUORESCENT LIGHTING FIXTURES, INCLUDING GENERAL CONSTRUCTION, LAMPS AND BALLASTS SHALL CONFORM TO THE ENERGY EFFICIENCY REQUIREMENTS OF CONSOLIDATED EDISON CO. AND QUALITY FOR A UTILITY REBATE TO OWNER UNDER CON EDISON'S ENLIGHTENED ENERGY LIGHTING REBATE PROGRAM. CONTRACTOR SHALL COORDINATE REBATE PROGRAM WITH CON EDISON AND ARRANGE FOR CON EDISON TO PERFORM A SURVEY TO INVENTORY ALL EXISTING FIXTURES PRIOR TO DEMOLITION.

H. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED FOR USE IN NEW YORK CITY. AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.

14. TELEPHONE CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.

C. OUTLETS SHALL BE:

1. WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.

F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.

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Innovators in Educational Child Care

PROJECT

LIGHTBRIDGE ACADEMY

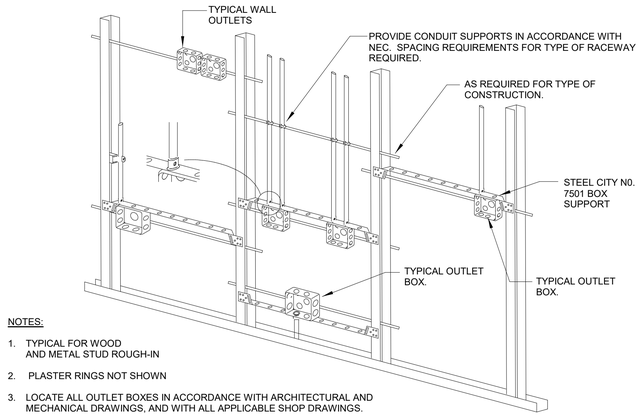
SHEET TITLE:

ELECTRICAL SPECIFICATIONS (2 OF 2)

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
E-302



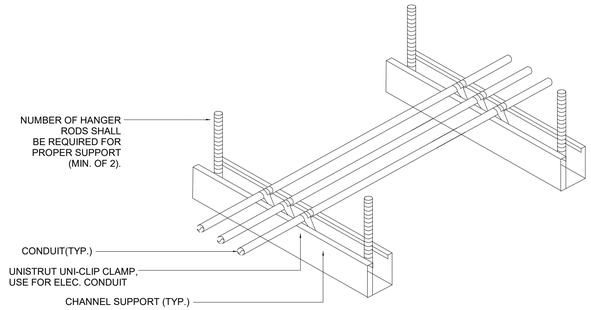
NOTES:

1. TYPICAL FOR WOOD AND METAL STUD ROUGH-IN
2. PLASTER RINGS NOT SHOWN
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.
4. IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

1 / E401 DETAIL TYPICAL ROUGH-IN REQUIREMENTS
N.T.S

NOTE:

THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS,APPLICABLE CODES AND STANDARDS.



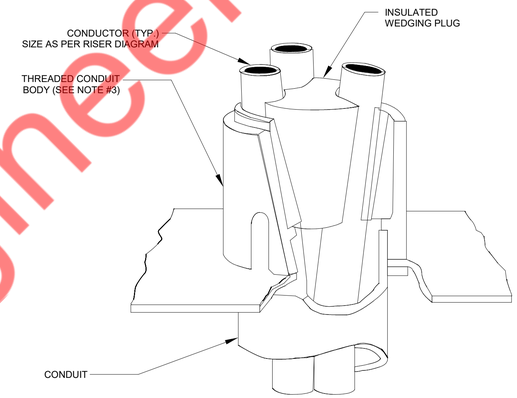
NOTES:

1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.

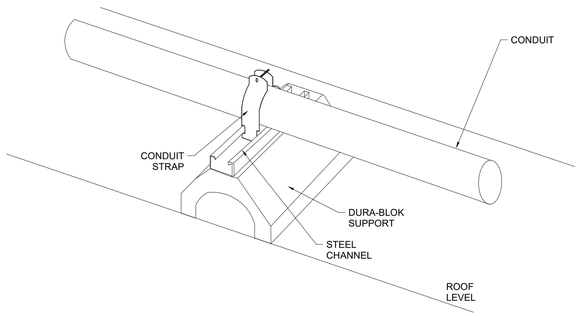
2 / E401 CONDUIT SUPPORT DETAIL
N.T.S

NOTES:

1. ALL CONDUCTORS IN VERTICAL RACEWAYS SHALL BE SUPPORTED IN ACCORDANCE WITH ARTICLE 300.19 OF NEC. CABLE SUPPORTS SHALL BE LOCATED AT THE INTERVALS REQUIRED BY THE NEC.
2. CABLE SUPPORT SYSTEM SHALL BE AS MANUFACTURED BY O-Z GEDNEY WITH pOZI-GRIP "S-STYLE" WEDGING PLUG OR APPROVED EQUAL.
3. FOR THREADLESS CONDUIT (RIGID, IMC OR EMT), ATTACH CONDUIT BODY TO MALE THREADS OF A SET SCREW OR COMPRESSION CONNECT, AS PERMITTED BY SPECIFICATIONS.
4. PROVIDE PULL BOX AT EACH LOCATION OF CABLE SUPPORTS. PULL BOX SHALL BE SIZED AS PER CODE TO ACCOMMODATE ALL CONDUITS.



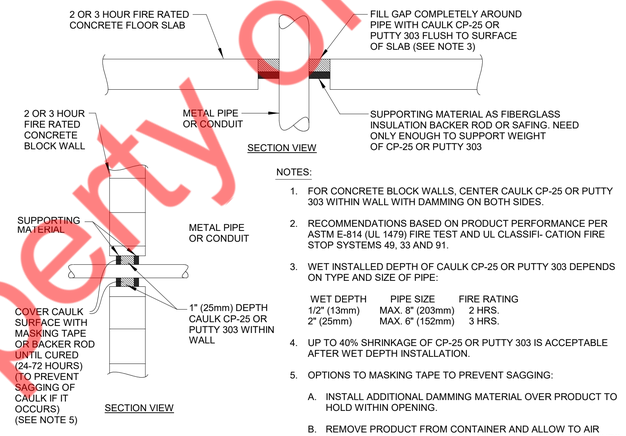
3 / E401 VERTICAL CABLE SUPPORT DETAIL
N.T.S



NOTES:

1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".

4 / E401 CONDUIT SUPPORT DETAIL ON ROOF
N.T.S



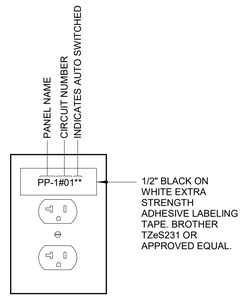
NOTES:

1. FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.
2. RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFI- CATION FIRE STOP SYSTEMS 49, 33 AND 91.
3. WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:

WET DEPTH	PIPE SIZE	FIRE RATING
1/2" (13mm)	MAX. 8" (203mm)	2 HRS.
2" (25mm)	MAX. 6" (152mm)	3 HRS.

4. UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.
5. OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
   A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
   B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.
6. WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm). A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.

5 / E401 FIRE STOP DETAIL
N.T.S



6 / E401 RECEPTACLE LABEL DETAIL
N.T.S

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PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL DETAILS (1 OF 4)

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
E-401

OAC AND VAC MANUAL MODE OPERATION:

1. SWITCHES ARE REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR WITH SWITCH.

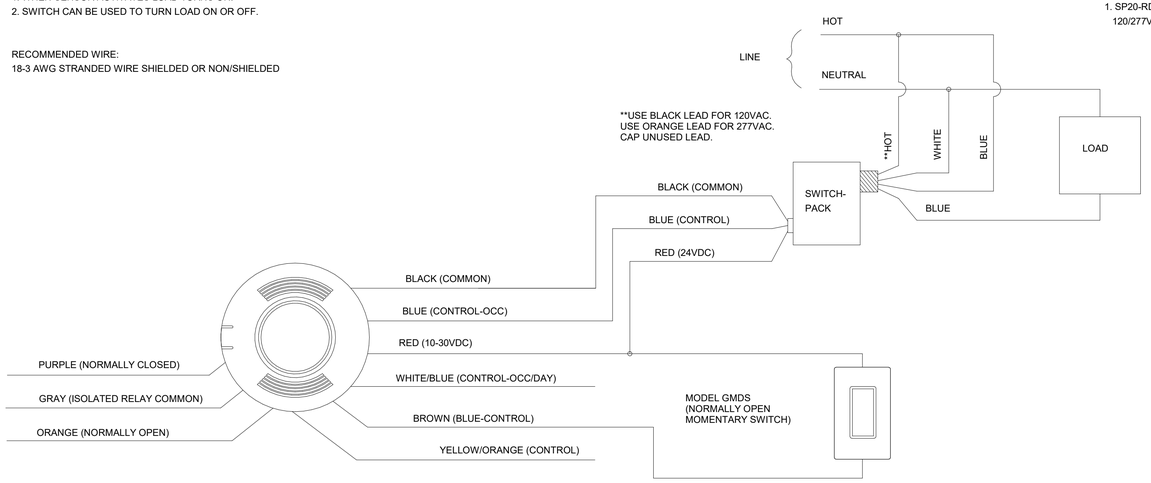
OAC AUTOMATIC MODE OPERATION:

1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. SWITCH CAN BE USED TO TURN LOAD ON OR OFF.

RECOMMENDED WIRE:
18-3 AWG STRANDED WIRE SHIELDED OR NON/SHIELDED

NOTES

1. SP20-RD4 SWITCHPACK SHOWN. 120/277VAC 20AMP RATING.



1 E402 OCCUPANCY - AUTO ON/OFF. WIRING DIAGRAM - LOW VOLTAGE CEILING SENSOR
N.T.S

MANUAL MODE OPERATION:

1. PUSHBUTTON PRESS IS REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR BY PRESSING PUSH BUTTON.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

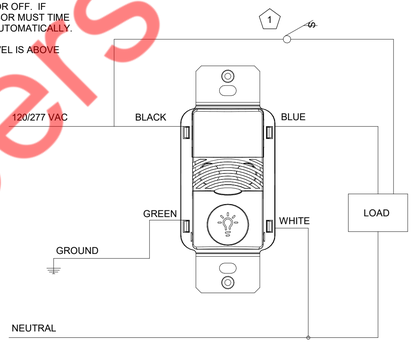
AUTOMATIC MODE OPERATION:

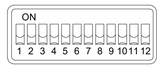
1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. PUSHBUTTON CAN BE USED TO TURN LOAD ON OR OFF. IF PUSHBUTTON IS USED TO TURN LOAD OFF, SENSOR MUST TIME OUT FIRST, BEFORE LOAD CAN TURN BACK ON AUTOMATICALLY.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

SENSOR TYPES INCLUDE:

ONW-D-1001-MV-N

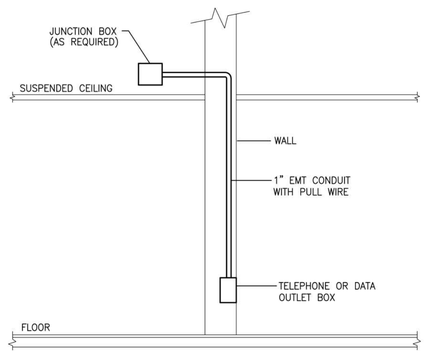
1 PROVIDE SENSING CONDUCTOR TAPPED AHEAD OF ANY SWITCHES WHERE SWITCH SERVES EMERGENCY FIXTURES.



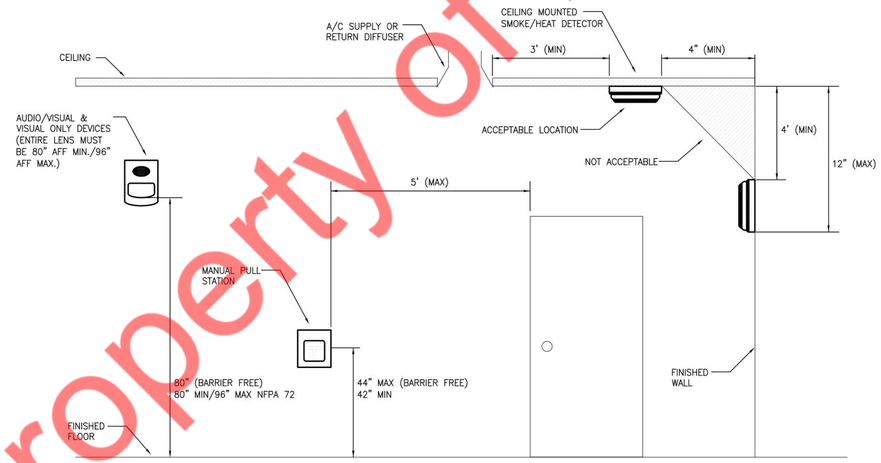


(ONW-D-1001-MV-N SENSORS)
ON (UP) = MANUAL ON
OFF (DOWN) = AUTO ON

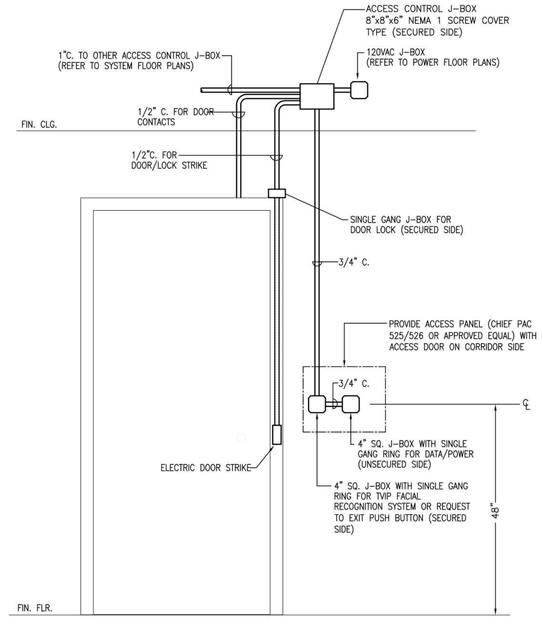
2 E402 OCCUPANCY/VACANCY-SINGLE LEVEL WIRING DIAGRAM-LOW VOLTAGE WALL SWITCH SENSOR (NEUTRAL CONNECTION)
N.T.S



3 E402 TYPICAL EMPTY CONDUIT FOR TELEPHONE/DATA RACEWAY
N.T.S



4 E402 FIRE ALARM DEVICE TYPICAL MOUNTING HEIGHT
N.T.S



5 E402 ACCESS CONTROL CONDUIT DETAIL FOR FACIAL RECOGNATION SYSTEM
N.T.S

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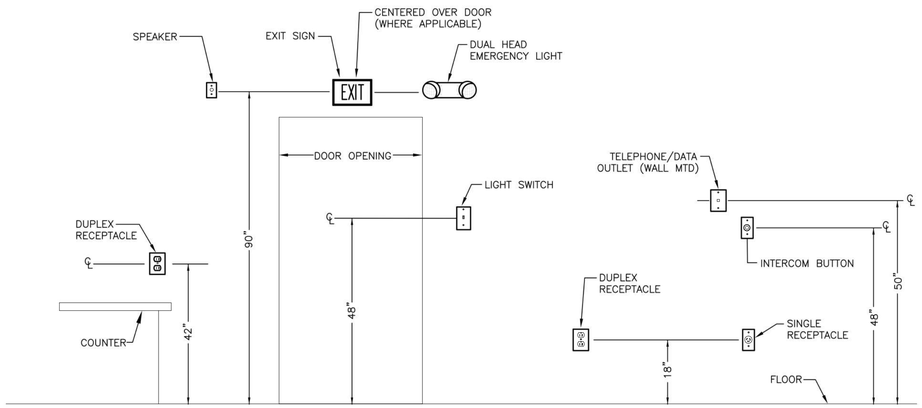
SHEET TITLE:

ELECTRICAL DETAILS (2 OF 4)

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
E-402

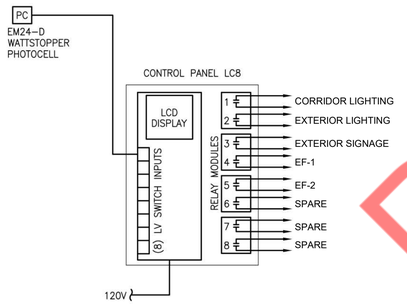


1 E403 TYPICAL MOUNTING HEIGHT DETAIL
N.T.S

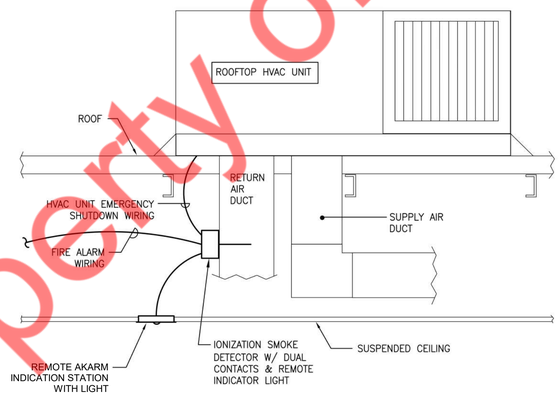
RELAY CONTROL SCHEDULE

CONTROL PANEL /CONTACTOR	RELAY DESIGN.	CIRCUIT CONTROLLED	CONTROL DESIGNATION	OVERRIDE DESIGNATION
LC8	1	P3# 17	CORRIDOR LIGHTING	PANEL
	2	P3# 23	EXTERIOR LIGHTING	PC
	3	P3# 25	EXTERIOR SIGNAGE	PC
	4	P3# 40	EF-1	PANEL
	5	P3# 42	EF-2	PANEL
	6		SPARE	
	7		SPARE	
	8		SPARE	

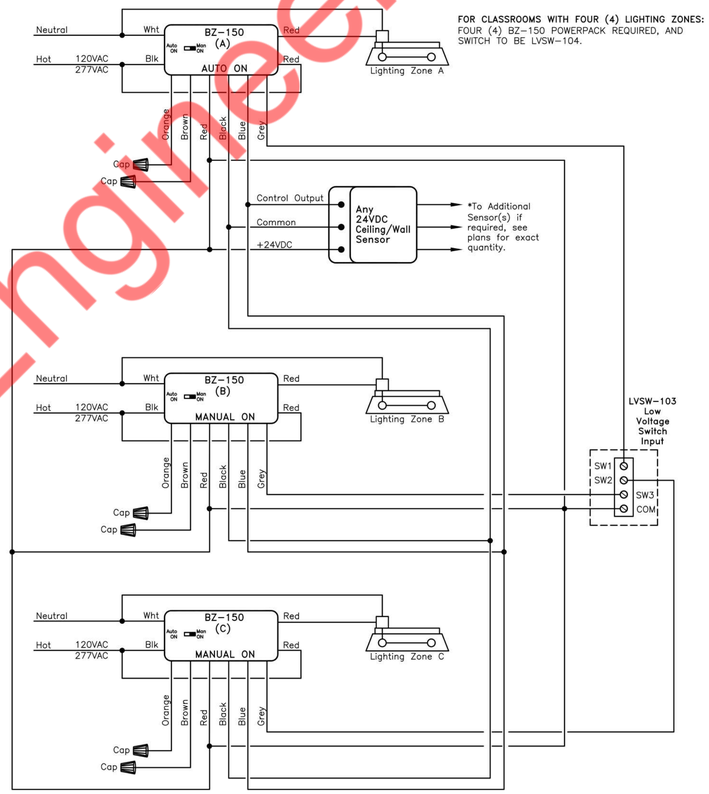
NOTES:
1. EC SHALL FURNISH AND INSTALL ALL EQUIPMENT SHOWN.
2. PROVIDE WATTSTOPPER LC-8 LIGHTING CONTROL PANEL.
3. PROVIDE 3 WIRE LOW VOLTAGE MOMENTARY OVERRIDE SWITCH.
4. TIME SCHEDULE TO BE COORDINATED WITH TENANT.
5. PROVIDE (3) DUAL SINGLE-POLE RELAYS MODULES AND (1) DOUBLE-POLE RELAY MODULE.
6. LV SWITCH SHALL SERVE AS MANUAL OVERRIDE SWITCH FOR GENERAL LIGHTING.
7. ALL 120V LOCAL SWITCHES SHALL BE WIRED DOWNSTREAM OF RELAYS.
8. COORDINATE EXACT LOCATION OF PHOTOCELL IN FIELD. PHOTOCELL SHALL FACE NORTHERN SKY



3 E403 AUTOMATIC LIGHTING CONTROL DETAIL
N.T.S



4 E403 DUCT MOUNTED SMOKE DETECTOR DETAIL -ROOFTOP HVAC UNIT
N.T.S



2 E403 LIGHTING CONTROL WIRING DETAIL
N.T.S

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PROJECT

LIGHTBRIDGE ACADEMY

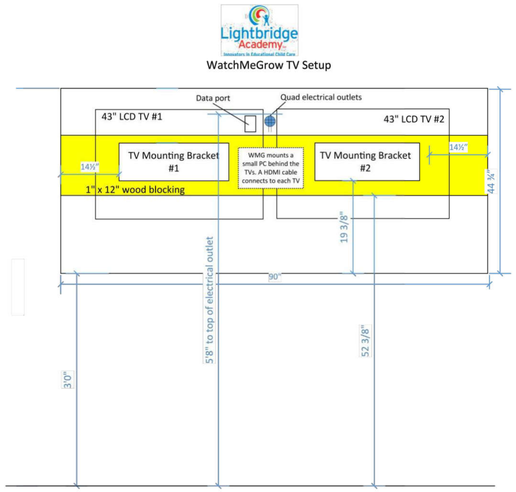
SHEET TITLE:

ELECTRICAL DETAILS (3 OF 4)

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

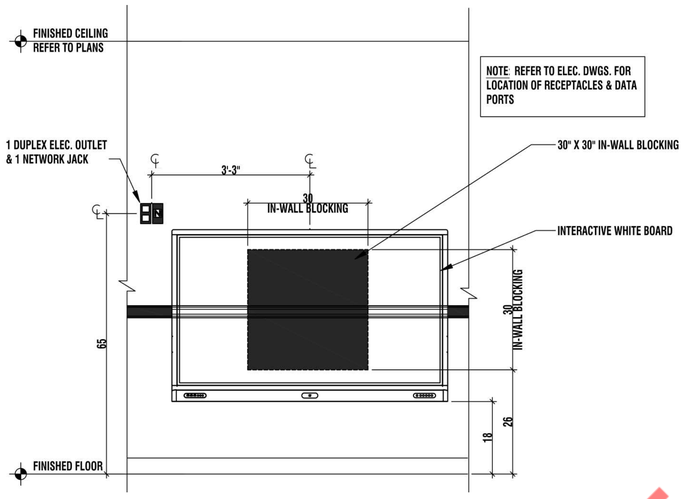
JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO. E-403

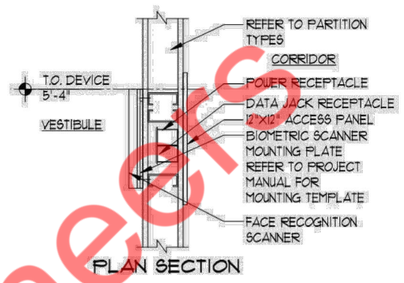


* SAMSUNG TVs & MOUNTS PROVIDED BY PCG.
*WATCHMEGROW tv SYSTEM PROVIDED BY WMG.

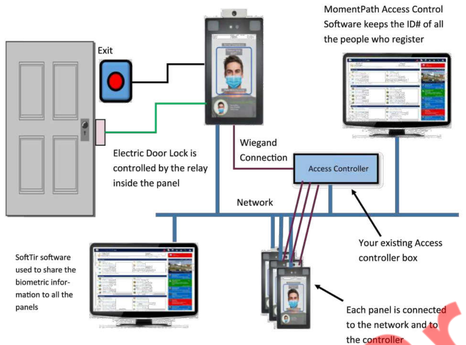
1 E404 WATCHMEGROW TV SETUP
N.T.S



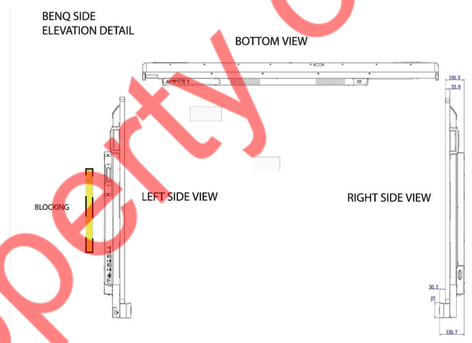
2 E404 LIGHTBRIDGE INTERACTIVE WHITEBOARD ELEVATION
N.T.S



3 E404 FACIAL RECOGINATION SCANNER DETAIL
N.T.S



4 E404 FACIAL RECOGNITION CONNECTIONS
N.T.S



5 E404 BEN Q INTERACTIVE MOUNT ELEVATION
N.T.S

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PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

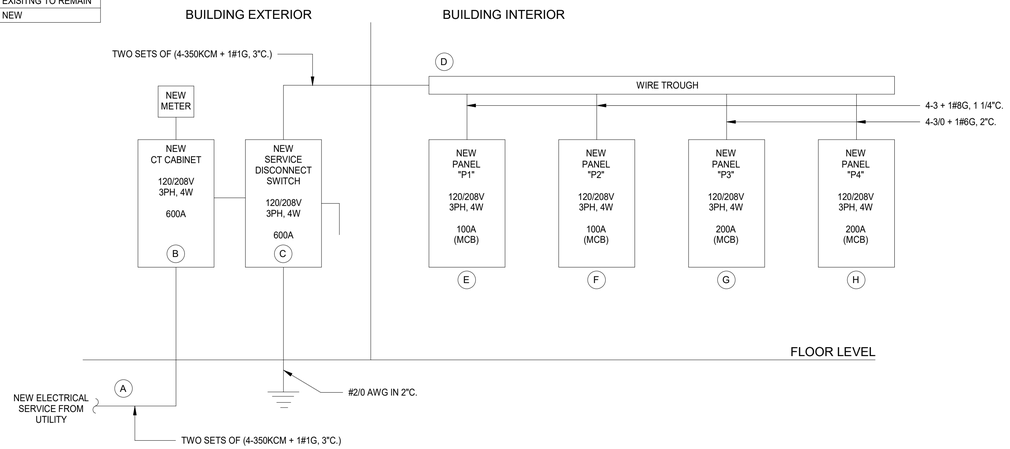
ELECTRICAL DETAILS (4 OF 4)

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
E-404

LEGEND	
SYMBOL	DESCRIPTION
– – –	EXISITNG TO REMAIN
———	NEW



1 ELECTRICAL RISER DIAGRAM
1/8" = 1'-0"

RISER DIAGRAM KEYED WORK NOTES

A. NEW 600AMP, 208/120V, 3-PHASE ELECTRICAL SERVICE FROM UTILITY FOR THE PROJECT SPACE. E.C. SHALL VERIFY THE EXACT LOCATION & INCOMING INFORMATION IN TERMS OF OVERHEAD/UNDERGROUND IN FIELD.

B. NEW 600AMP, 208/120V, 3-PHASE ELECTRICAL METER/CT CABINET FOR THE PROJECT SPACE. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

C. NEW 600AMP, 208/120V, 3-PHASE SERVICE FUSED DISCONNECT SWITCH FOR THE PROJECT SPACE. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

D. NEW WIRE TROUGH FOR THE ELECTRICAL PANELS. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

E. NEW 100AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "P1" FOR THE PROJECT. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

F. NEW 100AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "P2" FOR THE PROJECT. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

G. NEW 200AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "P3" FOR THE PROJECT. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

H. NEW 200AMP, 208/120V, 3-PHASE ELECTRICAL PANEL "P4" FOR THE PROJECT. E.C. SHALL VERIFY THE EXACT LOCATION IN FIELD.

RISER DIAGRAM GENERAL NOTES

1. E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.

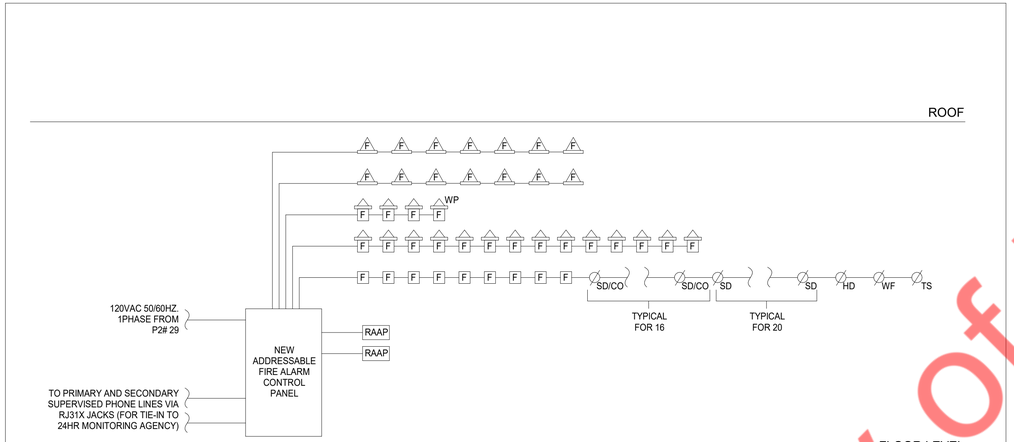
2. ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.

3. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY THE EXACT EXISTING DISRIBUTION AND RATINGS OF ALL EQUIPMENTS/PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.

4. 4. E.C. SHALL VERIFY THE RATING, SIZE AND OPERABLE CONDITION OF EXISTING FEEDERS, CABLES AND CONNECTIONS IN FIELD. REPLACE IF FOUND INOPERABLE BASE BID ACCORDINGLY.

5. WORKING CLEARANCES SHALL BE PROVIDED FOR ALL ELECTRICAL EQUIPMENT (SWITCHBOARDS, PANEL-BOARDS, TRANSFORMERS, STARTERS, DISCONNECTS, ETC. AS APPLICABLE) IN STRICT COMPLIANCE WITH N.E.C. CHAPTER 1, PART B, SECTION 110-26(A). LOCATIONS SHOWN ON FLOOR PLANS ARE SCHEMATIC AND DIAGRAMMATIC IN NATURE. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING COMPLIANCE WITH THE ABOVE N.E.C. REFERENCE. THIS REQUIREMENT APPLIES TO EQUIPMENT ON FLOOR PLANS AS WELL AS TO EQUIPMENT SHOWN ON RISER.

6. LOCATE ANY RELATED PULL-BOXES SO THAT THEY WILL BE FULLY ACCESSIBLE AFTER ALL CONSTRUCTION WORK IS COMPLETE. AS WITH ALL WORK, COORDINATE IN ADVANCE WITH ALL OTHER TRADES.



NOTES

1. PROVIDE NEW ADDRESSABLE FIRE ALARM SYSTEM WITH VOICE.

2. ALL EQUIPMENT AND DEVICES USED SHALL BE BY APPROVED MANUFACTURERS AND SHALL BE LISTED FOR THEIR USE.

3. PROVIDE SUFFICIENT CAPACITY FOR FUTURE DEVICES.

2 FIRE ALARM RISER DIAGRAM
1/8" = 1'-0"

FIRE ALARM SEQUENCE OF OPERATION

A. THE SYSTEM SHALL IDENTIFY ANY OFF NORMAL CONDITION AND LOG EACH CONDITION INTO THE SYSTEM DATABASE AS AN EVENT.

1. THE SYSTEM SHALL AUTOMATICALLY DISPLAY ON THE CONTROL PANEL LIQUID CRYSTAL DISPLAY THE FIRST EVENT OF THE HIGHEST PRIORITY BY TYPE. THE PRIORITIES AND TYPES SHALL BE ALARM, SUPERVISORY, TROUBLE, AND MONITOR.

2. THE SYSTEM SHALL HAVE A QUEUE OPERATION, AND SHALL NOT REQUIRE EVENT ACKNOWLEDGMENT BY THE SYSTEM OPERATOR. THE SYSTEM SHALL HAVE A LABELED COLOR CODED INDICATOR FOR EACH TYPE OF EVENT; ALARM RED, SUPERVISORY YELLOW, TROUBLE YELLOW, MONITOR YELLOW. WHEN AN UNSEEN EVENT EXISTS FOR A GIVEN TYPE, THE INDICATOR SHALL BE LIT.

3. FOR EACH EVENT, THE DISPLAY SHALL INCLUDE THE CURRENT TIME, THE TOTAL NUMBER OF EVENTS, THE TYPE OF EVENT, THE TIME THE EVENT OCCURRED AND UP TO A 42 CHARACTER CUSTOM USER DESCRIPTION.

4. THE USER SHALL BE ABLE TO REVIEW EACH EVENT BY SIMPLY SELECTING SCROLLING KEYS (UP-DOWN) FOR EACH EVENT TYPE.

5. ALARM, SUPERVISORY, OR TROUBLE EVENTS SHALL SOUND A SILENCING AUDIBLE SIGNAL AT THE CONTROL PANEL.

B. OPERATION OF ANY ALARM INITIATING DEVICE SHALL AUTOMATICALLY:

1. UPDATE THE CONTROL/DISPLAY AS DESCRIBED ABOVE (A.1.)

2. SOUND ALL AUDIBLE APPLIANCES IN A TEMPORAL-3 ON THE ALARMING FLOOR OR AS REQUIRED OTHERWISE BY LOCAL AUTHORITIES HAVING JURISDICTION IN ACCORDANCE WITH THE BUILDING'S FIRE SAFETY AND EVACUATION PLANS. ALL AUDIBLE APPLIANCES SHALL BE SYNCHRONIZED WITH EACH OTHER WHEN TWO OR MORE AUDIBLE DEVICES CAN BE HEARD. AUDIBLE DEVICES SHALL HAVE THE ABILITY TO BE SILENCED.

3. ACTIVATE ALL STROBE APPLIANCES. ALL STROBE APPLIANCES SHALL BE SYNCHRONIZED WITH EACH OTHER IN ANY LOCATION WITH TWO OR MORE DEVICES IN A COMMON FIELD OF VIEW. VISUAL DEVICES SHALL BE NON-SILENCED UNLESS THE SYSTEM IS SUCCESSFULLY RESET.

4. OPERATE CONTROL RELAY CONTACTS TO SHUTDOWN ALL HVAC UNITS SERVING THE FLOOR OF ALARM INITIATION.

5. OPERATE CONTROL RELAY CONTACTS TO RELEASE ALL MAGNETICALLY HELD SMOKE DOORS THROUGHOUT THE BUILDING.

6. VISUALLY ANNUNCIATE THE INDIVIDUAL POINT OF ALARM ON ALL REMOTE ANNUNCIATOR PANELS. THE VISUAL INDICATION SHALL REMAIN ON UNTIL THE ALARM CONDITION IS RESET TO NORMAL.

7. TRANSMIT AN ALARM CONDITION, VIA THE INTEGRAL CENTRAL STATION COMMUNICATOR, TO CENTRAL STATION/LOCAL FIRE DEPARTMENT (AS REQUIRED BY THE AHJ).

C. ACTIVATION OF A SPRINKLER SUPERVISORY INITIATING DEVICE (TAMPER SWITCH) SHALL:

1. UPDATE THE CONTROL/DISPLAY AS DESCRIBED ABOVE (A.1.)

2. TRANSMIT A SUPERVISORY CONDITION, VIA THE INTEGRAL CENTRAL STATION COMMUNICATOR, TO CENTRAL STATION/LOCAL FIRE DEPARTMENT (AS REQUIRED BY THE AHJ).

3. VISUALLY ANNUNCIATE THE INDIVIDUAL POINT ON ALL REMOTE ANNUNCIATOR PANELS. THE VISUAL INDICATION SHALL REMAIN ON UNTIL THE CONDITION IS RESET TO NORMAL.

D. THE ENTIRE FIRE ALARM SYSTEM WIRING SHALL BE ELECTRICALLY UPERVISED TO AUTOMATICALLY DETECT AND REPORT TROUBLE CONDITIONS TO THE FIRE ALARM CONTROL PANEL. ANY OPENS, GROUNDS OR DISARRANGEMENT OF SYSTEM WIRING AND SHORTS ACROSS ALARM SIGNALING WIRING SHALL AUTOMATICALLY:

1. UPDATE THE CONTROL/DISPLAY AS DESCRIBED ABOVE (A.1.)

2. TRANSMIT A TROUBLE CONDITION, VIA THE INTEGRAL CENTRAL STATION COMMUNICATOR, TO CENTRAL STATION/LOCAL FIRE DEPARTMENT (AS REQUIRED BY THE AHJ). VISUALLY AND AUDIBLY ANNUNCIATE A GENERAL TROUBLE CONDITION, ON THE REMOTE ANNUNCIATOR PANELS. THE VISUAL INDICATION SHALL REMAIN ON UNTIL THE TROUBLE CONDITION IS 3. REPAIRED.

E. ACTIVATION OF CARBON MONOXIDE DETECTOR SHALL:

1. ACTUATE LOCAL VISIBLE COMMON SUPERVISORY SIGNAL INDICATOR AND DISPLAY ON LCD

2. ACTUATE LOCAL AUDIBLE SUPERVISORY SIGNAL

3. DISPLAY/PRINT CHANGE OF STATUS 3

4. TRANSMIT CO ALARM SIGNAL TO SUPERVISING STATION

5. SHUTDOWN ASSOCIATED CARBON MONOXIDE PRODUCING EQUIPMENT

FIRE ALARM SPECIFICATIONS

1. NEW FIRE ALARM SYSTEM WORK

A. MANUAL FIRE ALARM SYSTEM THAT ACTIVATES NON VOICE OCCUPANT NOTIFICATION SYSTEM IN ACCORDANCE WITH PENNSYLVANIA UNIFORM CONSTRUCTION CODE AND ITS ADOPTED STANDARDS INCLUDING 2018 INTERNATIONAL BUILDING CODE, SECTION 907.2.3. THE SYSTEM SHALL ALSO INCLUDE FAN SHUTDOWN FUNCTIONS PER THE SEQUENCE OF OPERATIONS. THE CONTROL PANEL SHALL BE FULLY ADDRESSABLE AND UTILIZE INTELLIGENT DEVICES AND MODULES AS SHOWN ON THE DRAWINGS.

B. DUCT MOUNTED SMOKE DETECTORS: PROVIDE NEW DUCT MOUNTED SMOKE DETECTORS WHERE INDICATED ON THE DRAWINGS. PROVIDE SAMPLING TUBES, INTEGRATED TEST SWITCH AND REMOTE ALARM LED. DETECTORS SHALL FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR AND WILL BE INSTALLED BY THE HVAC CONTRACTOR. DUCT SMOKE DETECTORS SHALL BE WIRED INDIVIDUALLY BACK TO THE SPRINKLER AND SMOKE DETECTION ALARM SYSTEM. ACTIVATION OF THE DETECTOR SHALL INDICATE AN ALARM CONDITION ON THE SPRINKLER AND SMOKE DETECTION ALARM SYSTEM AND SUBSEQUENTLY SHUT DOWN THE ASSOCIATED AIR HANDLING UNIT.

C. FAN SHUT DOWN: PROVIDE REQUIRED RELAYS FOR FAN SHUTDOWN IN ACCORDANCE WITH ALL APPLICABLE LOCAL LAWS AND AS INDICATED IN CONTRACT DOCUMENTS. FANS THAT WERE SHUTDOWN DURING SMOKE/FIRE CONDITION MUST NOT AUTOMATICALLY RE-START OR BE RE-ENERGIZED UPON RESET OF SPRINKLER AND SMOKE DETECTION ALARM CONTROL PANEL. A MANUAL MEANS OF RESTARTING THE FANS OR FAN SYSTEM SHALL FUNCTION INDEPENDENTLY.

D. ALL NEW EQUIPMENT SHALL BE IN COMPLIANCE WITH ALL APPLICABLE LOCAL CODES AND REGULATIONS.

2. FIRE ALARM SYSTEM DIVISION OF WORK IS AS FOLLOWS:

A. FIRE ALARM VENDOR WILL PROVIDE THE FOLLOWING INSTALLATION PACKAGE UNDER THIS CONTRACT:
1) FURNISH ALL DRAWINGS, MATERIAL AND PROGRAM CHANGES.
2) FILE DRAWINGS WITH LOCAL AUTHORITIES HAVING JURISDICATION.
3) COORDINATE INSPECTIONS WITH LOCAL AUTHORITIES HAVING JURISDICTION.
4) PROVIDE BUILDING OWNER WITH A LETTER ATTESTING THAT SAID SYSTEM(S) ARE FULLY OPERATIONAL PRIOR TO TENANT MOVE IN.

B. ELECTRICAL CONTRACTOR SHALL:
1) PURCHASE EQUIPMENT, DRAWINGS AND FILING FROM SYSTEM VENDOR.
2) INSTALL EQUIPMENT AND WIRE RUNS TO DESIGNATED POINTS PER VENDOR DRAWINGS.
3) FILE THE REQUIRED FORMS FOR HIS WORK WITH THE THE LOCAL AUTHORITIES HAVING JURISDICTION. 4) CONTRACTOR SHALL BE AVAILABLE ON THE DATE OF ANY INSPECTION OR TEST OF SUCH SYSTEMS REQUIRED BY LOCAL AUTHORITIES HAVING JURISDICTION.

3. TENANTS WILL NOT BE PERMITTED TO MOVE IN OR OCCUPY ANY AREAS UNTIL FIRE ALARM SYSTEM IS COMPLETE AND SYSTEM VENDOR CONFIRMS, IN WRITING, THAT THE SYSTEM(S) ARE OPERATIONAL.

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PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL RISER DIAGRAM

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
E-501

PANEL: P1

VOLTAGE: 120/208 Wye | **MAINS TYPE** MCB | **MOUNTING:** SURFACE
PHASE: 3 | **MAINS RATING:** 100 A | **PANEL LOCATION:** UTILITY ROOM
WIRE: 4 | **BUS:** 125 A | **SUPPLY FROM:** SERVICE DISCONNECT SWITCH

CKT. NO.	TRIP AMP	POLE S	CIRCUIT DESCRIPTION	LOAD TYPE	WIRE SIZE	A		B		C		WIRE SIZE	LOAD TYPE	CIRCUIT DESCRIPTION	POLE S	TRIP AMP	CKT. NO.
1	20	1	DAYCARE #1 RECEPTACLE	R	2#12, #12G, 3/4"C	0.54	0.54					2#12, #12G, 3/4"C	R	DAYCARE #2 RECEPTACLE	1	20	2
3	20	1	DAYCARE #3 RECEPTACLE	R	2#12, #12G, 3/4"C			0.54	0.72			2#12, #12G, 3/4"C	R	DAYCARE #4 RECEPTACLE	1	20	4
5	20	1	DAYCARE #5 RECEPTACLE	R	2#12, #12G, 3/4"C					0.72	0.72	2#12, #12G, 3/4"C	R	DAYCARE #6 RECEPTACLE	1	20	6
7	20	1	DAYCARE #7 RECEPTACLE	R	2#12, #12G, 3/4"C	0.90	0.90					2#12, #12G, 3/4"C	R	DAYCARE #8 RECEPTACLE	1	20	8
9	20	1	DAYCARE #9 RECEPTACLE	R	2#12, #12G, 3/4"C			0.90	0.72			2#12, #12G, 3/4"C	R	DAYCARE #10 RECEPTACLE	1	20	10
11	20	1	DAYCARE #11 RECEPTACLE	R	2#12, #12G, 3/4"C					0.90	0.36	2#12, #12G, 3/4"C	R	DAYCARE #9 IWB DED. RECEPTACLE	1	20	12
13	20	1	DAYCARE #1 REFRIGERATOR	E	2#12, #12G, 3/4"C	0.80	0.36					2#12, #12G, 3/4"C	R	DAYCARE #10 IWB DED. RECEPTACLE	1	20	14
15	20	1	DAYCARE #2 REFRIGERATOR	E	2#12, #12G, 3/4"C			0.80	0.36			2#12, #12G, 3/4"C	R	DAYCARE #11 IWB DED. RECEPTACLE	1	20	16
17	20	1	DAYCARE #3 REFRIGERATOR	E	2#12, #12G, 3/4"C					0.80	1.08	2#12, #12G, 3/4"C	R	COMMON AREA RECEPTACLE	1	20	18
19	20	1	DAYCARE #4 REFRIGERATOR	E	2#12, #12G, 3/4"C	0.80	0.72					2#12, #12G, 3/4"C	R	COMMON AREA RECEPTACLE	1	20	20
21	20	1	DAYCARE #5 REFRIGERATOR	E	2#12, #12G, 3/4"C			0.80	1.08			2#12, #12G, 3/4"C	R	EXTERIOR RECEPTACLE	1	20	22
23	20	1	DAYCARE #6 REFRIGERATOR	E	2#12, #12G, 3/4"C					0.80	1.50	2#12, #12G, 3/4"C	E	LAUNDRY WASHER	1	20	24
25	20	1	DAYCARE #7 REFRIGERATOR	E	2#12, #12G, 3/4"C	0.80	0.00						--	Spare	1	20	26
27	20	1	DAYCARE #8 REFRIGERATOR	E	2#12, #12G, 3/4"C			0.80	0.00				--	Spare	1	20	28
29	20	1	DAYCARE #9 REFRIGERATOR	E	2#12, #12G, 3/4"C					0.80	0.00		--	Spare	1	20	30
31	20	1	DAYCARE #10 REFRIGERATOR	E	2#12, #12G, 3/4"C	0.80	0.00						--	Spare	1	20	32
33	20	1	CONF. RM REFRIGERATOR	E	2#12, #12G, 3/4"C			0.80	0.00				--	Spare	1	20	34
35	20	1	STAFF LOUNGE REFRIGERATOR	E	2#12, #12G, 3/4"C					0.80	0.00		--	Spare	1	20	36
37	20	1	DRINKING FOUNTAIN	E	2#12, #12G, 3/4"C	1.80	0.00						--	Spare	1	20	38
39	40	2	LAUNDRY DRYER	E	2#8, #10G, 3/4"C			3.00	0.00				--	Spare	1	20	40
41	--	--	--	--	--					3.00	0.00		--	Spare	1	20	42
			TOTAL CONNECTED LOAD (KVA):			**8.96**		**10.52**		**11.48**							
			TOTAL CONNECTED AMPS:			**74.67**		**89.67**		**97.67**							

LOAD TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	L	0 VA	0.00%	0 VA
RECEPTACLE	R	12060 VA	91.46%	11030 VA
HVAC	H	0 VA	0.00%	0 VA
MOTOR	M	0 VA	0.00%	0 VA
KITCHEN/EQUIPMENTS	E	18900 VA	65.00%	12285 VA
OTHER	O	0 VA	0.00%	0 VA

NOTES:

PANEL TOTAL LOAD SUMMARY	
TOTAL CONNECTED LOAD:	30.96 kVA
TOTAL ESTIMATED DEMAND LOAD:	23.32 kVA
TOTAL CONNECTED CURRENT:	85.94 A
TOTAL ESTIMATED DEMAND CURRENT:	64.72 A

PANEL: P2

VOLTAGE: 120/208 Wye | **MAINS TYPE** | **MOUNTING:** SURFACE
PHASE: 3 | **MAINS RATING:** 100 A | **PANEL LOCATION:** UTILITY ROOM
WIRE: 4 | **BUS:** 125 A | **SUPPLY FROM:** SERVICE DISCONNECT SWITCH

CKT. NO.	TRIP AMP	POLE S	CIRCUIT DESCRIPTION	LOAD TYPE	WIRE SIZE	A		B		C		WIRE SIZE	LOAD TYPE	CIRCUIT DESCRIPTION	POLE S	TRIP AMP	CKT. NO.
1	20	1	DAYCARE #1 SMALL APPLIANCE	R	2#12, #12G, 3/4"C	1.20	1.20					2#12, #12G, 3/4"C	R	DAYCARE #2 SMALL APPLIANCE	1	20	2
3	20	1	DAYCARE #3 SMALL APPLIANCE	R	2#12, #12G, 3/4"C			1.20	1.20			2#12, #12G, 3/4"C	R	DAYCARE #4 SMALL APPLIANCE	1	20	4
5	20	1	DAYCARE #5 SMALL APPLIANCE	R	2#12, #12G, 3/4"C					1.20	1.20	2#12, #12G, 3/4"C	R	DAYCARE #6 SMALL APPLIANCE	1	20	6
7	20	1	DAYCARE #7 SMALL APPLIANCE	R	2#12, #12G, 3/4"C	1.20	1.20					2#12, #12G, 3/4"C	R	DAYCARE #8 SMALL APPLIANCE	1	20	8
9	20	1	DAYCARE #9 SMALL APPLIANCE	R	2#12, #12G, 3/4"C			1.20	1.20			2#12, #12G, 3/4"C	R	DAYCARE #10 SMALL APPLIANCE	1	20	10
11	20	1	STAFF LOUNGE SMALL APPLIANCE	R	2#12, #12G, 3/4"C					1.20	0.36	2#12, #12G, 3/4"C	R	DEDICATED I.T. CLO. RECEPTACLE	1	20	12
13	20	1	STAFF LOUNGE SMALL APPLIANCE	R	2#12, #12G, 3/4"C	1.20	0.36					2#12, #12G, 3/4"C	R	DEDICATED I.T. CLO. RECEPTACLE	1	20	14
15	20	1	STAFF LOUNGE SMALL APPLIANCE	R	2#12, #12G, 3/4"C			1.20	0.36			2#12, #12G, 3/4"C	R	DEDICATED I.T. CLO. RECEPTACLE	1	20	16
17	20	1	PRINTER RECEPTACLE	R	2#12, #12G, 3/4"C					0.50	0.18	2#12, #12G, 3/4"C	R	CONF. RM. WORKSTAT. RECEPTACLE	1	20	18
19	20	1	CONF. RM. RECEPTACLES	R	2#12, #12G, 3/4"C	0.36	0.36					2#12, #12G, 3/4"C	R	WATCH ME GROW TV RECEPTACLE	1	20	20
21	20	1	OFFICE RECEPTACLES	R	2#12, #12G, 3/4"C			0.90	0.36			2#12, #12G, 3/4"C	R	TOILET RECEPTACLES	1	20	22
23	20	1	STAFF LOUNGE RECEPTACLE	R	2#12, #12G, 3/4"C					0.36	0.36	2#12, #12G, 3/4"C	R	BONDING ROOM RECEPTACLES	1	20	24
25	20	1	KNOX BOX	O	2#12, #12G, 3/4"C	0.50	0.18					2#12, #12G, 3/4"C	R	FIRE ROOM RECEPTACLE	1	20	26
27	20	1	WIFI BOOSTER	O	2#12, #12G, 3/4"C			0.75	0.36			2#12, #12G, 3/4"C	R	TELE/DATA RECEPTACLE	1	20	28
29	20	1	FIRE ALARM PANEL	O	2#12, #12G, 3/4"C					0.18	0.00		--	Spare	1	20	30
31	20	1	GAS WATER HEATER	O	2#12, #12G, 3/4"C	0.60	0.00						--	Spare	1	20	32
33	20	1	ELECTRIC DOOR STRIKE	O	2#12, #12G, 3/4"C			0.36	0.00				--	Spare	1	20	34
35	20	1	ELECTRIC DOOR STRIKE	O	2#12, #12G, 3/4"C					0.72	0.00		--	Spare	1	20	36
37	20	1	ELECTRIC DOOR STRIKE	O	2#12, #12G, 3/4"C	0.72	0.00						--	Spare	1	20	38
39	20	1	FACIAL SCANNER	O	2#12, #12G, 3/4"C			0.20	0.00				--	Spare	1	20	40
41	20	1	RECIRCULATION PUMP	M	2#12, #12G, 3/4"C					0.30	0.00		--	Spare	1	20	42
			TOTAL CONNECTED LOAD (KVA):			**9.08**		**9.29**		**6.56**							
			TOTAL CONNECTED AMPS:			**78.90**		**80.65**		**54.67**							

LOAD TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	L	0 VA	0.00%	0 VA
RECEPTACLE	R	20600 VA	74.27%	15300 VA
HVAC	H	0 VA	0.00%	0 VA
MOTOR	M	300 VA	100.00%	300 VA
KITCHEN/EQUIPMENTS	E	0 VA	0.00%	0 VA
OTHER	O	4030 VA	100.00%	4030 VA

NOTES:

PANEL TOTAL LOAD SUMMARY	
TOTAL CONNECTED LOAD:	24.93 kVA
TOTAL ESTIMATED DEMAND LOAD:	19.63 kVA
TOTAL CONNECTED CURRENT:	89.20 A
TOTAL ESTIMATED DEMAND CURRENT:	54.49 A

PANEL: P3

VOLTAGE: 120/208 Wye | **MAINS TYPE** MCB | **MOUNTING:** SURFACE
PHASE: 3 | **MAINS RATING:** 200 A | **PANEL LOCATION:** UTILITY ROOM
WIRE: 4 | **BUS:** 225 A | **SUPPLY FROM:** SERVICE DISCONNECT SWITCH

CKT. NO.	TRIP AMP	POLE S	CIRCUIT DESCRIPTION	LOAD TYPE	WIRE SIZE	A		B		C		WIRE SIZE	LOAD TYPE	CIRCUIT DESCRIPTION	POLE S	TRIP AMP	CKT. NO.
1	20	1	DAYCARE #1&2 LIGHTING	L	2#12, #12G, 3/4"C	0.60	2.00					2#10, #10G, 3/4"C	H	ECH-1	2	30	2
3	20	1	DAYCARE #3&4 LIGHTING	L	2#12, #12G, 3/4"C			0.69	2.00			--	--	--	--	--	4
5	20	1	DAYCARE #5&6 LIGHTING	L	2#12, #12G, 3/4"C					0.82	1.00	2#12, #12G, 3/4"C	H	ECH-2	2	20	6
7	20	1	DAYCARE #7 LIGHTING	L	2#12, #12G, 3/4"C	0.51	1.00					--	--	--	--	--	8
9	20	1	DAYCARE #8 LIGHTING	L	2#12, #12G, 3/4"C			0.55	1.00			2#12, #12G, 3/4"C	H	ECH-3	2	20	10
11	20	1	DAYCARE #9 LIGHTING	L	2#12, #12G, 3/4"C					0.51	1.00		--	--	--	--	12
13	20	1	DAYCARE #10 LIGHTING	L	2#12, #12G, 3/4"C	0.60	1.00					2#12, #12G, 3/4"C	H	ECH-4	2	20	14
15	20	1	DAYCARE #11 LIGHTING	L	2#12, #12G, 3/4"C			0.52	1.00			--	--	--	--	--	16
17	20	1	COMMON AREA LIGHTING	L	2#12, #12G, 3/4"C					0.95	1.00	2#12, #12G, 3/4"C	H	ECH-5	1	20	18
19	20	1	STAFF LOUNGE & LAUNDRY...	L	2#12, #12G, 3/4"C	0.17	1.44					2#12, #12G, 3/4"C	M	FR-1	1	20	20
21	20	1	I.T., CONF. RM. & OFFICE LIGHTING	L	2#12, #12G, 3/4"C			0.28	1.44			2#12, #12G, 3/4"C	M	FR-2	1	20	22
23	20	1	EXTERIOR LIGHTING	L	2#12, #12G, 3/4"C					1.80	1.44	2#12, #12G, 3/4"C	M	FR-3	1	20	24
25	20	1	EXTERIOR SIGNAGE	L	2#12, #12G, 3/4"C	1.50	1.44					2#12, #12G, 3/4"C	M	FR-4	1	20	26
27	20	1	EXTERIOR EMERGENCY FIXTURE	L	2#12, #12G, 3/4"C			0.14	1.44			2#12, #12G, 3/4"C	M	FR-5	1	20	28
29	20	1	MONUMENT SIGNAGE	L	2#12, #12G, 3/4"C					1.80	1.44	2#12, #12G, 3/4"C	M	FR-6	1	20	30
31	20	1	Spare	--		0.00	1.44					2#12, #12G, 3/4"C	M	FR-7	1	20	32
33	20	1	Spare	--				0.00	1.44			2#12, #12G, 3/4"C	M	FR-8	1	20	34
35	20	1	Spare	--						0.00	1.44	2#12, #12G, 3/4"C	M	FR-9	1	20	36
37	20	1	Spare	--		0.00	1.44					2#12, #12G, 3/4"C	M	FR-10	1	20	38
39	20	1	Spare	--				0.00	1.90			2#10, #10G, 3/4"C	M	EF-1	1	25	40
41	20	1	Spare	--						0.00	0.05	2#12, #12G, 3/4"C	M	EF-2	1	20	42
			TOTAL CONNECTED LOAD (KVA):			**13.14**		**12.39**		**13.25**							
			TOTAL CONNECTED AMPS:			**110.46**		**103.21**		**111.38**							

LOAD TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	L	11425 VA	125.00%	14281 VA
RECEPTACLE	R	0 VA	0.00%	0 VA
HVAC	H	11000 VA	100.00%	11000 VA
MOTOR	M	16350 VA	100.00%	16350 VA
KITCHEN/EQUIPMENTS	E	0 VA	0.00%	0 VA
OTHER	O	0 VA	0.00%	0 VA

NOTES:

PANEL TOTAL LOAD SUMMARY	
TOTAL CONNECTED LOAD:	38.77 kVA
TOTAL ESTIMATED DEMAND LOAD:	41.63 kVA
TOTAL CONNECTED CURRENT:	107.63 A
TOTAL ESTIMATED DEMAND CURRENT:	115.56 A

PANEL: P4

VOLTAGE: 120/208 Wye | **MAINS TYPE** MCB | **MOUNTING:** SURFACE
PHASE: 3 | **MAINS RATING:** 200 A | **PANEL LOCATION:** UTILITY ROOM
WIRE: 4 | **BUS:** 225 A | **SUPPLY FROM:** SERVICE DISCONNECT SWITCH

CKT. NO.	TRIP AMP	POLE S	CIRCUIT DESCRIPTION	LOAD TYPE	WIRE SIZE	A		B		C		WIRE SIZE	LOAD TYPE	CIRCUIT DESCRIPTION	POLE S	TRIP AMP	CKT. NO.
1	40	2	CU-1	H	2#8, #10G, 3/4"C	2.50	0.00						--	Spare	1	20	2
3	--	--	--	--	--			2.50	1.13			2#12, #12G, 3/4"C	M	AP-1, 2, 3, 4, 5	1	20	4
5	40	2	CU-2	H	2#8, #10G, 3/4"C					2.50	1.13	2#12, #12G, 3/4"C	M	AP-6, 7, 8, 9, 10	1	20	6
7	--	--	--	--	--	2.50	0.00						--	Spare	1	20	8
9	40	2	CU-3	H	2#8, #10G, 3/4"C			2.50	0.00				--	Spare	1	20	10
11	--	--	--	--	--					2.50	0.00		--	Spare	1	20	12
13	30	2	CU-4	H	2#10, #10G, 3/4"C	1.88	0.00						--	Spare	1	20	14
15	--	--	--	--	--			1.88	0.00				--	Spare	1	20	16
17	40	2	CU-5	H	2#8, #10G, 3/4"C					2.50	0.00		--	Spare	1	20	18
19	--	--	--	--	--	2.50	0.00						--	Spare	1	20	20
21	40	2	CU-6	H	2#8, #10G, 3/4"C			2.50	0.00				--	Spare	1	20	22
23	--	--	--	--	--					2.50	0.00		--	Spare	1	20	24
25	40	2	CU-7	H	2#8, #10G, 3/4"C	2.50	0.00						--	Spare	1	20	26
27	--	--	--	--	--			2.50	0.00				--	Spare	1	20	28
29	40	2	CU-8	H	2#8, #10G, 3/4"C					2.50	0.00		--	Spare	1	20	30
31	--	--	--	--	--	2.50	0.00						--	Spare	1	20	32
33	30	2	CU-9	H	2#10, #10G, 3/4"C			1.88	0.00				--	Spare	1	20	34
35	--	--	--	--	--					1.88	0.00		--	Spare	1	20	36
37	40	2	CU-10	H	2#8, #10G, 3/4"C	2.50	0.00						--	Spare	1	20	38
39	--	--	--	--	--			2.50	0.00				--	Spare	1	20	40
41	20	1	FIRE SMOKE DAMPER	M	2#12, #12G, 3/4"C					0.55	0.00		--	Spare	1	20	42
			TOTAL CONNECTED LOAD (KVA):			**16.88**		**17.38**		**16.05**							
			TOTAL CONNECTED AMPS:			**141.68**		**145.85**		**133.75**							

LOAD TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	L	0 VA	0.00%	0 VA
RECEPTACLE	R	0 VA	0.00%	0 VA
HVAC	H	47500 VA	100.00%	47500 VA
MOTOR	M	2800 VA	100.00%	2800 VA
KITCHEN/EQUIPMENTS	E	0 VA	0.00%	0 VA
OTHER	O	0 VA	0.00%	0 VA

NOTES:

PANEL TOTAL LOAD SUMMARY	
TOTAL CONNECTED LOAD:	50.30 kVA
TOTAL ESTIMATED DEMAND LOAD:	50.30 kVA
TOTAL CONNECTED CURRENT:	139.62 A
TOTAL ESTIMATED DEMAND CURRENT:	139.62 A

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Lightbridge Academy℠
Innovators in Educational Child Care

PROJECT

LIGHTBRIDGE ACADEMY

SHEET TITLE:

ELECTRICAL PANEL SCHEDULES

REV.	DATE	REMARKS
1	11/12/2024	BLDG. DEPT. RESPONSES
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
E-601

PLUMBING DRAWING LIST

DWG.NO	DRAWING NAME
P001	PLUMBING COVER SHEET
P002	PLUMBING SPECIFICATION
P100	PLUMBING WASTE AND VENT PLAN
P101	PLUMBING SUPPLY PLAN
P102	PLUMBING ROOF GAS PLAN
P200	PLUMBING RISER DIAGRAMS (1 OF 2)
P201	PLUMBING RISER DIAGRAMS (2 OF 2)
P300	PLUMBING DETAILS (1 OF 2)
P301	PLUMBING DETAILS (2 OF 2)

PLUMBING SYMBOLS LIST

- SANITARY PIPING
- VENT PIPING
- COLD WATER PIPING
- HOT WATER PIPING
- HOT WATER RETURN PIPING
- P-TRAP
- PIPE UP
- PIPE DROP
- PLUGGED OUTLET/CLEANOUT
- SHUT-OFF VALVE
- CHECK VALVE
- SLEEVE
- GAS PLUG VALVE
- CHECK VALVE
- VACUUM BREAKER
- WATER HAMMER ARRESTOR
- AIR RELEASE VALVE
- SHOCK ABSORBER
- BALANCING VALVE
- PRESSURE RELIEF VALVE
- POINT OF NEW CONNECTION
- POINT OF DISCONNECTION

MATERIAL SCHEDULE

SYSTEMS	PIPE												FITTINGS												JOINTS					
	REQUIRED	SERVICE C I PIPE (HUB & SPIGOT)	NON HUB C.I. PIPE	PVC. SCH. 40 DRAWINGS PIPE	CPVC SCH. 40	BLACK IRON	GALVANISED STEEL	COPPER TUBING TYPE (L)	COPPER TUBING TYPE (DWV)	DUCTILE IRON PIPE	X-LINKED POLYTHLENE	SERVICE C. I. FITTINGS (HUB & SPIGOT)	NON HUB C.I. FITTINGS	PVC. D.W.V FABRICATED	C.P.V.C. SCH. 40	BLACK IRON	GALVANISED STEEL	COPPER SOLDER FITTINGS	FLANGED DUCTILE IRON PIPE	BRASS ASTM F1960 LISTED	ELATOMERIC GASKET	PVC SOLVENT CEMENT	CPVC SOLVENT CEMENT	THREADED	SOLDERED 95-5	FLANGED DUCTILE IRON PIPE	COLD EXPANSION RING
SANITARY BUILDING DRAIN(UNDER GROUND)	●	●		A								●		A							●	A					
SANITARY BRANCHES	●		●	A									●	A							●	A					
VENT STACKS	●		●	A									●	A							●	A					
VENT BRACHES	●		●	A									●	A							●	A					
C.W. (SERVICE)	●									●										●					●		
C.W (DISTRIBUTION)	●				A			●							●								●				
H.W (DISTRIBUTION)	●				A			●							●								●				
GAS (DISTRIBUTION)	●					●										●								●			
FLUE POWER VENTING	●			A	●									A	●							A	●				
INDIRECT WASTE	●			A										A				●				A			●		

NOTES:-
'A' - PROVIDE DEDUCT ALTERNATE PRICE TO INSTALL ALTERNATE MATERIAL.
ALL MATERIAL INSTALLED WITHIN A PLENUM ARE TO HAVE A 25 FLAME SPREAD & 50 SMOKE DEVLOPED WHEN TESTED ACCORDING TO ASTM E84 OR BE INSULATED WITH 3M FIRE BARRIER PLENUM WRAP 5A+, OR APPROVED EQUAL. SO AS TO COMPLY WITH THE ABOVE REQUIREMENTS.

PLUMBING ABBREVIATIONS

AD	AREA DRAIN
AFF	ABOVE FINISH FLOOR
BFP	BACK FLOW PREVENTER
BT	BATH TUB
CO	CLEANOUT
CODP	CLEAN OUT DECK PLATE
CW	COLD WATER
DN	DOWN
DW	DISH WASHER
ET	EJECTOR DISCHARGE
EXIST.	EXISTING
FD	FLOOR DRAIN
G	GAS
GR	GAS RANGE
HW	HOT WATER
HWR	HOT WATER RETURN
HWHT	HOT WATER HEATER
KS	KITCHEN SINK
LAV	LAVATORY
OD	OVERFLOW DRAIN
PD	PUMP DISCHAGE
RD	ROOF DRAIN
S	SOIL
SAN	SANITARY
SH	SHOWER
SQ.FT	SQUARE FEET
TYP.	TYPICAL
ST	STORM
V	VENT
W	WASTE
WC	WATER CLOSET
WM	WASHING MACHINE
NIC	NOT IN CONTRACT

BACKFLOW PREVENTORS/VACUUM BREAKERS SCHEDULE

DESCRIPTION	MANUFACTURER	MODEL	REMARK
DOMESTIC WATER SERVICE	WATTS	2" LF009M2QT	REDUCED PRESSURE ZONE ASSEMBLY
COFFEE MAKER	WATTS	1/2" SD3	DUAL CHECK

EXPANSION TANK SCHEDULE

TAG	LOCATION	SERVICE	CAPACITY (GALLONS)	MANUFACTURER & MODEL	DIMENSION (DIA X HEIGHT)	WEIGHT (LBS)	NO. OF EXPANSION TANK
ET-1	REFER FLOOR PLANS	HW	6.4	THERM-X-TROL ST-12 C	12" X 14"	42	1

RECIRCULATING PUMP SCHEDULE

ITEM	QUANTITY	GPM	TOTAL HEAD(FT)	MOTOR HP	MANUFACTURER & MODEL NO	REMARKS
RCP-1	1	5	10	1/20	GRUNDFOS UP 26-64F	PROVIDE WITH GRUNDFOS AQUASTAT 595656 & GRUNDFOS PROGRAMMABLE TIMER 599388

THERMOSTATIC MIXING VALVE SCHEDULE

ITEM	SERVING	SERVICE	CAPACITY RANGE (GPM)		TEMP. RANGE (°F)		MANUFACTURER & MODEL NO.	REMARKS
			MIN.	MAX.	MIN.	MAX.		
MIXING VALVE	HAND SINK, LAVATORY	HOT WATER	0.5	20	105	120	WATTS MODEL LFMMVM1	-LEAD FREE VAST COPPER SILICON ALLOY BODY -ASSE 1017 LISTED -CSA APPROVED

HOT WATER HEATER SCHEDULE

TAG No.	FIXTURES SERVING	RATED GALLONS	QUANTITY	RECOVERY CAP. (GPH@ RISE)	TYPE	INPUT RATING	MANUFACTURER & MODEL NO.	REMARKS
WH-1	3 COMP. SINK, MOP SINK, HAND SINK, LAVATORY.	100	1	198 GPH @ 90°F	GAS STORAGE WATER HEATER	150,000 BTU/HR	A.O.SMITH CYCLONE MXI BTH-150(A)	-DIMENSIONS 27.75"DIA X 75.50" HEIGHT -WATER HEATERS SHALL HAVE 150PSI WORKING PRESSURE. -PROVIDE WITH TEMPERATURE & PRESSURE RELIEF VALVE. -MAINTAIN CLEARANCE AS PER MANUFACTURER RECOMMENDATION. -PROVIDE WITH DRAIN PAN.

PLUMBING FIXTURE SCHEDULE

TAG	DESCRIPTION	MAKE	MODEL	FAUCET	PIPING CONNECTIONS				COMMENTS
					COLD	HOT	TRAP	VENT	
SK-1	STAINLESS STEEL, SINGLE COMPARTMENT SINK. FURNISH SINK WITH TOP MOUNT SINGLE HANDLE ADA FAUCET.	DAYTON (ELKAY)	DAYTON 125224DF	ELKAY LK2478CR	1/2"	1/2"	1-1/2"	1-1/2"	PROVIDE INDIVIDUAL THERMOSTIC MIXING VALVE (HONYWELL AM100C1070 OR EQUAL) AT EACH FAUCET CONFORMING TO ASSE 1070. SET TEMPERATURE TO 110 °F.
LAV-1	VITREOUS CHINA LAVATORY FURNISH WITH CENTERSET, TWO HANDLE FULLY ADA COMPLIANT	GERBER	12-654	GERBER 43-411	1/2"	1/2"	1-1/2"	1-1/2"	TO BE INSTALLED @ 25" AFF TO RIM IN ALL CHILDREN'S CLASSROOMS & TOILET ROOMS. PROVIDE INDIVIDUAL THERMOSTIC MIXING VALVE AT EACH FAUCET CONFORMING TO ASSE 1070. SET TEMPERATURE TO 110 °F MAXIMUM FOR ALL LAVATORIES.
WC-1	ROUND FRONT BOWL FLOOR MOUNTED FLUSH VALVE 1.28 GPF WATER CLOSET 10" BOWL HEIGHT, 12" HEIGHT TO TOP OF SEAT, 10" ROUGH-IN.	AMERICAN STANDARD	2282.001	AMERICAN ST. 6047.121.002	1"	NA	INTEGRAL	2"	PROVIDE TOILET SEAT OPEN FRONT TYPE, LEVER HANDLE HAS TO BE OPEN SIDE OF ROOM. DISTANCE FROM CENTERLINE OF TOILET TO FINISH SIDE WALL SHALL BE 12". COORDINATE THE HEIGHT OF THE FLUSHOMETER AND WATER LINE WITH THE REQUIRED GRAB BAR HEIGHT.
WC-2	ELONGATED BOWL FLOOR MOUNTED FLUSH VALVE 1.28GPF WATER CLOSET,15" BOWL HEIGHT, 10" ROUGH-IN.	AMERICAN STANDARD	3451.001	AMERICAN ST. 6047.121.002	1"	NA	INTEGRAL	2"	PROVIDE TOILET SEAT OPEN FRONT TYPE, LEVER HANDLE HAS TO BE OPEN SIDE OF ROOM. DISTANCE FROM CENTERLINE OF TOILET TO FINISH SIDE WALL SHALL BE 16". COORDINATE THE HEIGHT OF THE FLUSHOMETER AND WATER LINE WITH THE REQUIRED GRAB BAR HEIGHT.
WC-3	HANDICAPPED ELONGATED BOWL FLOOR MOUNTED FLUSH VALVE. 1.28GPF WATER CLOSET 16 1/2" BOWL HEIGHT, 17 1/8" HEIGHT TO TOP OF SEAT, 10" ROUGH-IN.	AMERICAN STANDARD	3461.001	AMERICAN ST. 6047.121.002	1"	NA	INTEGRAL	2"	PROVIDE TOILET SEAT OPEN FRONT TYPE, LEVER HANDLE HAS TO BE OPEN SIDE OF ROOM. DISTANCE FROM CENTERLINE OF TOILET TO FINISH SIDE WALL SHALL BE 18".
DF-1	VERSATILE COOLER WALL MOUNT BI- LEVEL ADA FITERED REFRIGERATED. CAPACITY OF 8.0 GPH.	ELKAY	LZSTL8LC		1/2"	NA	1-1/2"	1-1/4"	115V / 60HZ / 5AMPS POWER SUPPLY
DF-2	BOTTLE FILLING STATION & SINGLE ADA COOLER. CAPACITY OF 8.0 GPH, FILTER IS INCLUDED.	ELKAY	LZS8WSLP		1/2"	NA	1-1/2"	1-1/4"	115V / 60HZ / 5AMPS POWER SUPPLY
FD-1	FLOOR DRAIN WITH LIGHT DUTY, 6" SQUARE, 2" NO- HUB OUTLET	ZURN	Z415-6S-2NH		NA	NA	2"	1-1/2"	PROVIDE WITH ASSE 1072 TRAP SEAL PROTECTION DEVICE.
TD-1	WIDE REVEAL TRENCH DRAIN SYSTEM	ZURN	Z884		NA	NA	3"	NA	FOR PLAYGROUND ONLY
FD-2	7" DIA MEDIUM DUTY FLOOR DRAIN FOR UTILITY ROOMS	ZURN	Z507-3NH		NA	NA	3"	2"	PROVIDE WITH ASSE 1072 TRAP SEAL PROTECTION DEVICE.
HB-1	ANIT-SIPHON, AUTOMATIC DRAINING NON FREEZE WALL HYDRANT WITH INTEGRAL BACKFLOW PREVENTER	ZURN	Z1321-C		1/2"	NA	NA	NA	
MS-1	FIBERGLASS MOP SERVICE BASIN, 24"X24"x10" WITH CHROME PLATED SERVICE FAUCET WITH WALL BRACE HOSE THREAD ON SPOUT & INTEGRAL VACUUM BREAKER.	MUSTEE	63M	MUSTEE 63.600A	1/2"	1/2"	3"	2"	PROVIDE WITH MUSTEE 65.600 MOP HANGER AND 67.2424 DURAGUARD WALL GUARDS. FAUCET TO BE INSTALLED 36" A.F.F.
3-CS	STAINLESS STEEL, THREE COMPARTMENT SINK.	ELKAY	CMR43224	AMERICAN ST. 7441300.002	3/4"	3/4"	2"	1-1/2"	PROVIDE 1/2" CW LINE THROUGH THE COUNTER FOR FUTURE CONNECTION FOR OVER THE COUNTER WATER DISPENSTUR. PROVIDE / 120F HOT WATER SUPPY CIRCULATED HOT WATER SYSTEM.
PS-1	INTERCHANGEABLE FLUSH MOUNT FEATURE	BASKET WEAVE	BSWV-001LF -ZCS		1"	NA	NA	NA	RAIN DROP PRODUCTS LLC. PROVIDE LOW FLOW SPRINKLERS AND 1" CW SUPPLY
CW-1	RECESSED CLOTHES WASHER SUPPLY BOX WITH 4 TURN BALL VALVES AND 2" STANDPIPE CONNECTION.	OATEY	38398	INCLUDED	1/2"	1/2"	2"	1-1/2"	PROVIDE WITH 120 °F HOT WATER SUPPLY FROM CIRCULATED HOT WATER SYSTEM.
LS-1	33" X 23" X 25" SINGLE PIECE SLOP SINK WITH 6" SWING SPOUT FAUCET WITH AERATOR	MUSTEE	14CP UTILATUB	MUSTEE 93.600	1/2"	1/2"	3"	2"	COMBO LAUNDRY / UTILITY TUB, ALL ACCESSORIES AND FAUCET IS INCLUDED IN COMBO BOX.

NOTE: CONTRACTOR TO COORDINATE WITH ARCHITECTURAL DRAWING FOR ALL PLUMBING FIXTURES SPECIFICATIONS AND MOUNTING HEIGHT INSTALLATION.

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PROJECT
INTERIOR FITOUT FOR:
LIGHTBRIDGE ACADEMY

SHEET TITLE:
PLUMBING COVER SHEET

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

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SHEET NO.
P001

BUILDING DEPARTMENT PLUMBING NOTES

ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT WATER DISTRIBUTION PIPING SYSTEMS) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2024 OHIO PLUMBING CODE.

1. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 2024 TABLE 702.2
2. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION PC 305
3. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC 306
4. RODENT PROOFING AS PER PER SECTION PC 304
5. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303, PC 605, PC 702, PC 902,PC 1102.
6. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
7. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER IPC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708
8. DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 708.
9. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS PER SECTION PC 308
10. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION PC 601-603, 604, 606, 607, 608, 610
11. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708, 711.
12. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH PC 917
13. GAS PIPING INSTALLATION SHALL IN ACCORDANCE WITH 2020 OHIO FUEL GAS CODE.

PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

A. PROVIDE ALL MATERIAL, TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING AND NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.

C. OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.

D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.

E. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK, THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING CONDITIONS.

F. IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.

G. ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.

H. COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.

I. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.

J. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.

K. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

1. GAS PIPING:

1. ALL GAS PIPING WORK SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE 2021, LOCAL UTILITY GAS REQUIREMENTS AND NFPA 54, ANSI Z223.1.
2. FURNISH AND INSTALL ALL NECESSARY GAS PIPING TO ALL EQUIPMENT REQUIRING GAS SUPPLY INCLUDING RECONNECTION TO EXISTING ACTIVE GAS BURNING EQUIPMENT
3. PROVIDE A LUBRICATED GAS VALVE AT ALL CONNECTIONS TO EQUIPMENT.
4. ALL GAS PIPING AND INSTALLATION SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF LOCAL UTILITY GAS COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.
5. PROVIDE ADEQUATE SUPPORT FOR ALL PIPING.
6. GAS PIPING SHALL BE BLACK STEEL SCHEDULE 40 THREADED PIPE CONFORMING TO ANSI B36-20.
7. FITTINGS SHALL BE MALLEABLE IRON.
8. 1VALVES SHALL BE NORDSTROM IRON PLUG VALVES FIG. 142.
9. PIPING UNDERGROUND BENEATH BUILDING SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE SECTION 404.12.

1.02 SUBMITTALS

A. SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION. UNLESS OTHERWISE DIRECTED, CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW.

1. PIPE AND FITTINGS
2. VALVES
3. HANGERS AND SUPPORTS
4. PLUMBING PIPING LAYOUT
5. TESTS
6. PLUMBING FIXTURES
7. WATER HEATERS & ACCESSORIES
8. MIXING VALVES
9. ALL SCHEDULED PLUMBING EQUIPMENT

B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.

C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.

D. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW, AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR OMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.

E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.

F. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, NSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.

G. FOR ALL BELOW GRADE PIPING WHERE ACTUAL NSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS- BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.

H. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

1.03 SUBSTITUTIONS

A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.

B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

1.05 DEFINITIONS

A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.

B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.

C. PROVIDE: TO FURNISH AND INSTALL.

D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.

E. REFER TO THE NATIONAL STANDARD PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.06 DRAWINGS

A. THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUSTRATE THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GENERAL LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPMENT, RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL PIPING SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHITECT, ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXISTING AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF THE OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHALL BE INSTALLED CONCEALED IN FINISHED SPACES, UNLESS NOTED OTHERWISE.

B. PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVEN IF NOT PARTICULARLY SHOWN OR SPECIFIED.

C. REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAWINGS FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS.

D. REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR ALL FIXTURE ROUGHING SIZE REQUIREMENTS.

E. VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDITIONS WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY THE OWNER.

F. LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE FINAL ARCHITECTURAL DRAWINGS.

1.07 PRODUCTS

A. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD- DRAWN COPPER TUBE WITH PEX & CPVC IS A ALTERNATE MATERIAL AS PER 2024 OHIO PLUMBING CODE TABLE 605.3.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER- SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY- APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY- APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH ENERGY CONSERVATION CODE 2021 SECTION C403.12.3 REFER BELOW TABLE.

MINIMUM PIPE INSULATION THICKNESS							
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU· IN / (H· FT2· °F)	MEAN RATING TEMPERATURE, °F	<1	<1 to <1-1/2	<1-1/2 to <4	<4 to <8	<8
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5	1.5
40-60	0.21-0.27	75	0.5	0.5	0.5	0.5	0.5

7. WATER-HEATING EQUIPMENT AND HOT WATER STORAGE TANKS SHALL MEET THE MINIMUM PERFORMANCE REQUIREMENTS GIVEN IN THE IECC 2021, SECTION C404.2, TABLE 404.2. THE EFFICIENCY SHALL BE VERIFIED THROUGH DATA FURNISHED BY THE MANUFACTURER OF THE EQUIPMENT OR THROUGH CERTIFICATION UNDER AN APPROVED CERTIFICATION PROGRAM.

8. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2024 C404.5, THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH	
	PUBLIC LAV	OTHER FIXTURE
1/2"	2"	43"
3/4"	0.5"	20"
1"	0.5"	13"
1-1/4"	0.5"	8"
1-1/2"	0.5"	6"
2" OR LARGER	0.5"	4"

9. WATER DISTRIBUTION SYSTEM AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2024 C404.6, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:

a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE, FITTING OR APPLIANCE.
b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).

10. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2021 C404.6.1 HEATED-WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.

11. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER IECC 2021 C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE ABOVE.

B. SANITARY AND VENT PIPING:

1. ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING. PVC PIPE IS A ALTERNATE MATERIAL AS PER 2024 OHIO PLUMBING CODE TABLE 702.2.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
3. PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES.
4. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.
5. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.

6 PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.

7. AS PER IECC 2024 C404.3 STORAGE TANK TYPE WATER HEATERS AND HOT WATER STORAGE TANKS THAT HAVE VERTICAL WATER PIPES CONNECTING TO THE INLET AND OUTLET OF THE TANK SHALL BE PROVIDED WITH INTEGRAL HEAT TRAPS AT THOSE INLETS AND OUTLETS OR SHALL HAVE PIPE CONFIGURED HEAT TRAPS IN THE PIPING CONNECTED TO THOSE INLETS AND OUTLETS.

C. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.
4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION, THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2-1/2" AND LARGER (1-1/4" AND LARGER INBOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.
6. SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

D. VALVES:

1. PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT-OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT-OFF DUTY.
2. ALL FIXTURES WITH THE EXCEPTION O FLUSHOMETER-EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME-PLATED STOPS WITH CHROME-PLATED ESCUTCHEONS ON PIPING PENETRATIONS.
3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.
4. ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.
5. ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.
6. PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.

E. SLEEVES AND ESCUTCHEONS:

1. SLEEVES THROUGH STRUCTURAL CONCRETE MEMBERS AND SLEEVES FOR WALLS BELOW GRADE AND FLOORS ON GRADE SHALL BE STANDARD WEIGHT GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH OTHER THAN STRUCTURAL COMPONENTS OF THE BUILDING SHALL BE 20 GAGE GALVANIZED SHEET METAL WITH LOCK SEAM JOINTS. USG THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.
2. PIPE ESCUTCHEON PLATES SHALL BE INSTALLED WHERE EXPOSED PIPING PASSES THROUGH WALLS, CEILINGS, AND FLOORS AND SHALL BE MINIMUM 20 GAGE STEEL. PROVIDE CHROME PLATED ESCUTCHEON PLATES IN FINISHED AREAS.

F. DRAINAGE ACCESSORIES F.
1.GENERAL:
a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.
b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

G. INSTALL PIPING TO CONSERVE BUILDING SPACE. DO NOT INTERFERE WITH USE OF BUILDING SPACE AND THE WORK OF OTHER TRADES. ALL PIPING RUN IN CEILING SHALL BE INSTALLED TIGHT TO THE STRUCTURE ABOVE.

H. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTIONWITHOUT STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'-0" IN LENGTH.

I. IN ALL AREAS WITH FINISHED SURFACES, SYSTEM PIPING AND I. COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED SURFACES.

J. REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE-PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.

K. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

L. IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.

M. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

N. PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER APPROVED INDIRECT WASTE SOURCE.

O. PROVIDE ACCESS DOORS/PANELS FOR SERVICE AND ACCESS TO ALL VALVES AND OTHER SYSTEM COMPONENTS ENCLOSED IN WALLS AND CEILINGS. ACCESS DOORS SHALL BE FURNISHED BY THIS CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR.

P. ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.

Q. ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS, OR CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL RATED FIRE BARRIER CAULK OR APPROVED EQUAL.

R. WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY R. FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.

S. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS,

T. FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.

PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK-CLOSING VALVES.

MAINTAIN ALL REQUIRED AND RECOMMENDED CLEARANCES FOR ALL PLUMBING SYSTEM COMPONENTS AND EQUIPMENT.

2. INSTALLATION

2.01 GENERAL

A. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.

B. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.

C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.

D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.

E. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND FERROUS END PIPE.

F. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.

G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.

H. COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.

I. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.

J. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

K. THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS, CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND CONNECTION TO EXISTING SYSTEMS.

L. WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS ON THE SANITARY AND VENT STACKS.

2.02 ABOVE GRADE

A. INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVES INTENDED PURPOSES.

B. ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT-OFF VALVES AND ALL LOW POINTS IN PIPING.

C. USE EXISTING CONNECTIONS AT MAINS WHERE AVAILABLE FOR NEW BRANCH PIPING. LOCATE ALL RISERS AND PIPING BEFORE CONSTRUCTION COMMENCES AND TAKE CARE NOT TO DAMAGE SAME. ANY DAMAGE OCCURRING TO THE EXISTING PIPING WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

2.03 INSULATION

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 11/4" AND 11/2" THICK FOR PIPE SIZE 11/2" AND GREATER WITH MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH 1/2" THICK FOR PIPE SIZE UP TO 11/4" AND 1" THICK FOR PIPE SIZE 11/2" AND GREATER WITH 1" MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED WITH MANVILLE ZESTON 2000 PVC INSULAT-ED FITTING COVERS. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE INTERNATIONAL BUILDING CODE ,PENNSYLVANIA REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2024 INTERNATIONAL ENERGY CONSERVATION CODE.

3. TESTING

A. FOR ALL SANITARY DRAINAGE AND VENT SYSTEMS REQUIRING TESTING, A WATER TEST WITH NO LESS THAN 10-FOOT HEAD OF WATER SHALL BE COMPLETED WHEN PLASTIC PIPE IS INSTALLED IN ACCORDANCE WITH IPC 2021 OR OHIO 2024 PLUMBING CODE SECTIONS 312.2 AND 312.3.

B. FOR ALL WATER SUPPLY SYSTEMS REQUIRING TESTING AND THAT ARE INSTALLED WITH PLASTIC PIPE, A HYDROSTATIC TEST SHALL BE PROVIDED WITH THE WORKING PRESSURE OF THE SYSTEM UTILIZED AS THE MINIMUM TEST PRESSURE IN ACCORDANCE WITH IPC 2021 OR OHIO 2024 PLUMBING CODE SECTION 312.5.

C. AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.

D. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.

E. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT P

GENERAL NOTE:

1.CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.

2.REFER RISER DIAGRAMS FOR ALL PIPE SIZES.

3.PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED. LOCATE IN FIELD IN COORDINATION WITH ARCHITECT.

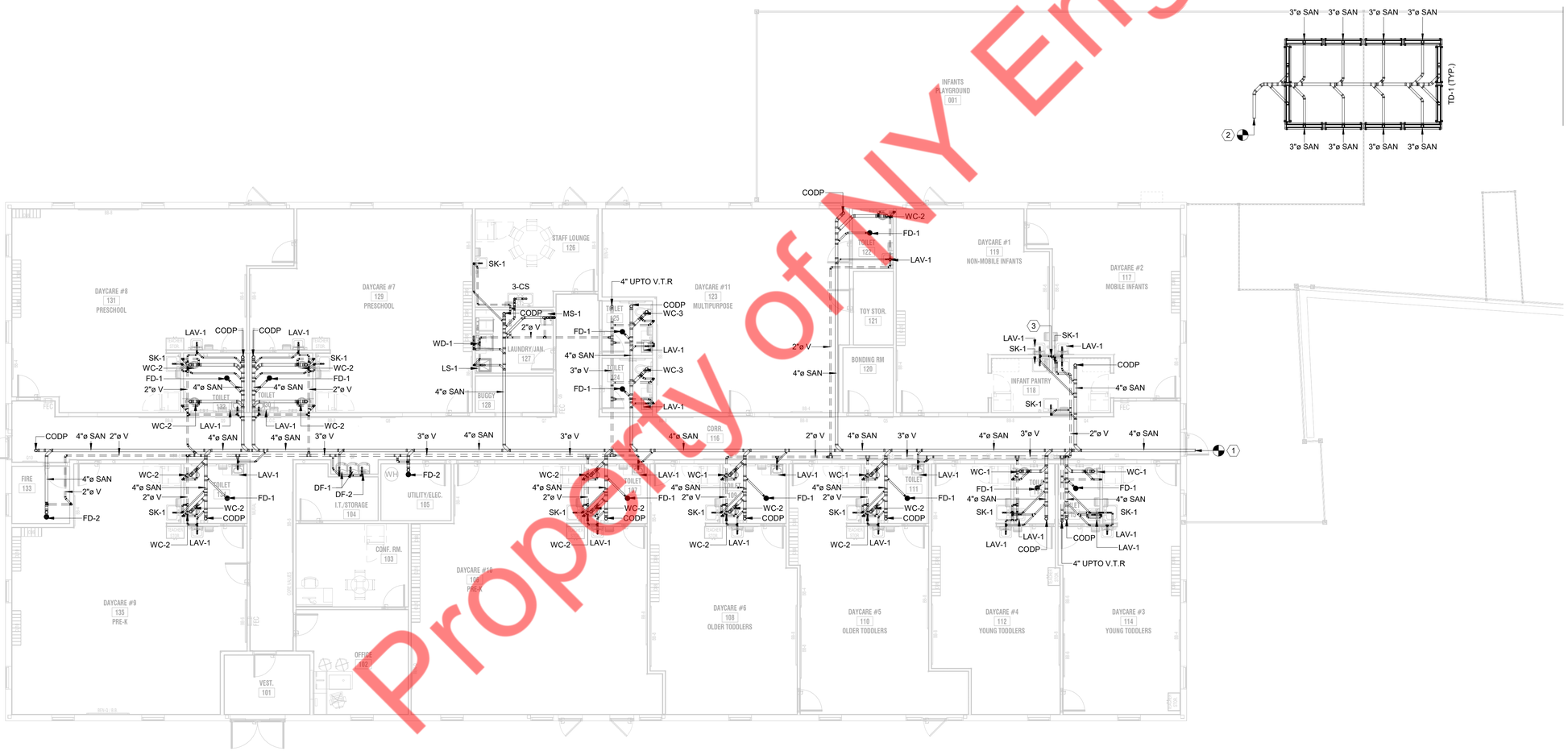
4.PROVIDE ELECTRONIC TRAP PRIMER TO ALL FLOOR DRAINS INSTALLED IN MECHANICAL ROOMS & FLOW CONTROLLED TRAP PRIMER ALL OTHER FLOOR DRAINS.

7.ALL HOT & COLD WATER LINES & ALL DRAIN LINES UNDER SINKS SHALL HAVE A FLANGE SUPPLIED BY PLUMBING CONTRACTOR. FINISH TO MATCH FAUCETS AT ALL VANITIES & KITCHEN CABINETS.

8. WATER HEATER DRAIN SPILLS TO THE FLOOR DRAIN.

KEY NOTES

1. CONNECT NEW 4" SANITARY WASTE TO 4" SANITARY CONNECTION AS SHOWN ON CIVIL ENGINEER'S PLAN, COORDINATE IN FIELD EXACT LOCATION.
2. CONNECT TO NEAREST SITE UNDERDRAIN, BY CIVIL.
3. COMBINE VENT PIPING BELOW COUNTER LEVEL, RISE AT FULL HEIGHT WALL.



1 PLUMBING WASTE AND VENT PLAN
1/8" = 1'-0"

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PROJECT
INTERIOR FITOUT FOR:
LIGHTBRIDGE ACADEMY

SHEET TITLE:

PLUMBING WASTE AND VENT PLAN

REV.	DATE	REMARKS
	09/23/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
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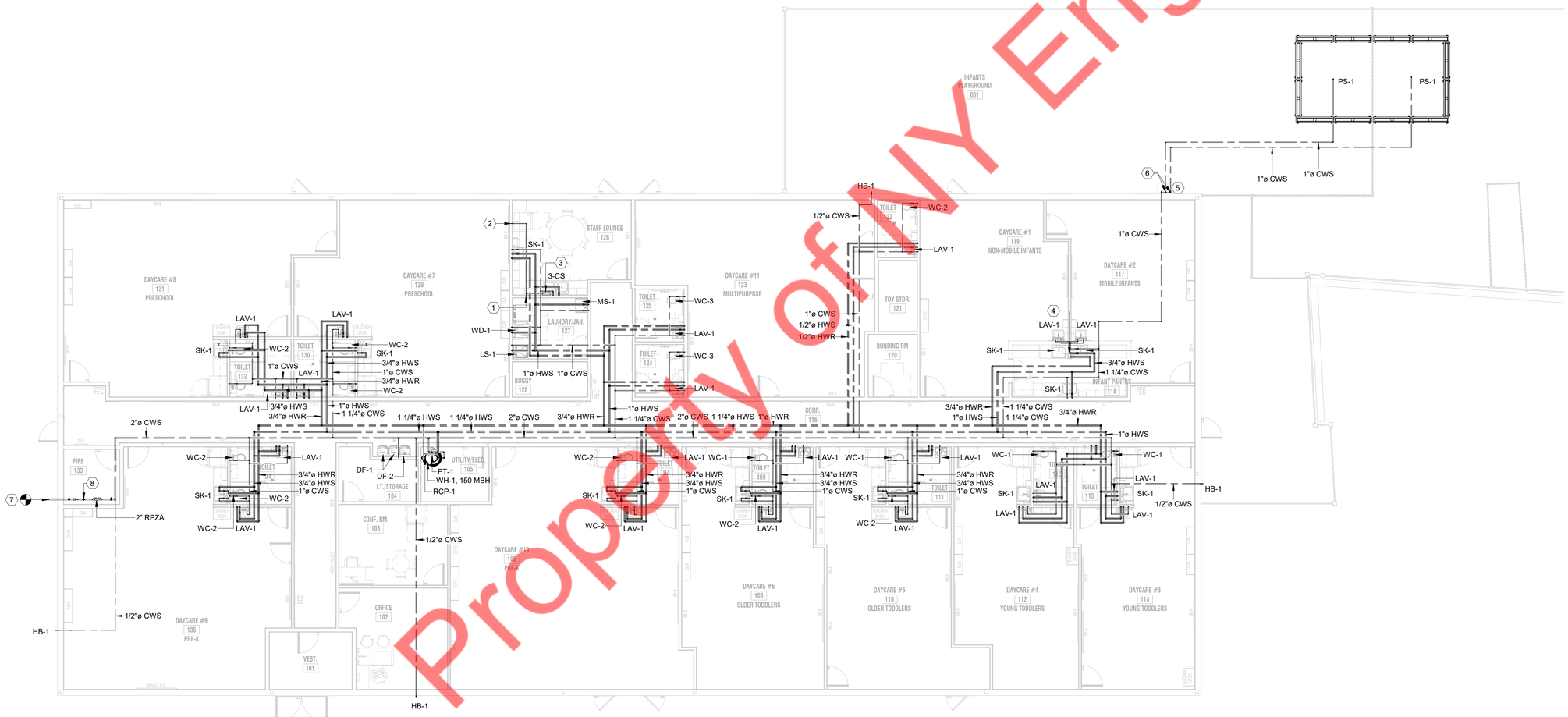
SHEET NO.
P100

GENERAL NOTE:

1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2021 (REFER SHEET P002)
2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
5. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED. LOCATE IN FIELD IN COORDINATION WITH ARCHITECT.
6. PROVIDE ELECTRONIC TRAP PRIMER TO ALL FLOOR DRAINS INSTALLED IN MECHANICAL ROOMS & FLOW CONTROLLED TRAP PRIMER ALL OTHER FLOOR DRAINS.
7. ALL HOT & COLD WATER LINES & ALL DRAIN LINES UNDER SINKS SHALL HAVE A FLANGE SUPPLIED BY PLUMBING CONTRACTOR. FINISH TO MATCH FAUCETS AT ALL VANITIES & KITCHEN CABINETS.
8. WATER HEATER DRAIN SPILLS TO THE FLOOR DRAIN
9. PROVIDE THERMOSTATIC MIXING VALVES AT ALL LAVATORIES AND HAND SINKS. SET AT 110 F MAX.

KEY NOTES:

1. 3/8" DOMESTIC COLD WATER CONNECTION FOR COUNTERTOP APPLIANCE. PROVIDE WITH ISOLATION SHUTTOFF VALVE, VACCUM BRAKER AND UNION FITTING
2. 3/8" DOMESTIC COLD WATER CONNECTION FOR INTERGRAL REFRIGIRATOR ICE MAKER. PROVIDE WITH ISOLATION VALVE, DUAL CHECK VALVE WITH ATMOSPHERIC VENT AND UNION FITTING. PROVIDE OUTLET BOX AND ALL ACCESSORIES WITH TRIM OPTIONS.
3. PROVIDE CATRIDGE WATER FILTER FOR PANTRY APPLIANCES. PROVIDE WITH 2 SPARE CATRIDGES FOR TERNAT USE.
4. HW, CW & HWR PIPE DN IN FULL HEIGHT WALL & BRANCH PIPING RUNNING UNDERCOUNTER TILL SINKS.
5. WATER SPRINKLER MANIFLOD TO BE LOCATED 17"AFF INSIDE 50 GAL. RESIN DECK BOX. CONTRACTOR TO COORDINATE EXACT DIMENSION OF DECK BOX AND INSTALLATION HEIGHT AND INFORM ARCH/OWNER OF ANY ISSUES PRIOR TO INSTALLATION IN FILED. LOCATE RPZ ASSEMBLY IN SPRINKLER SERVICE ROOM
6. PROVIDE EACH SPRINKLER CONNECTION WITH ISOLATION CONTROL VALVE AND FLOW CONTROL VALVE. FLOW CONTROL VALVE TO BE 1"WATTS IDROSET SERIES CSD OR EQUAL. ADJUST IN FIELD THE MAXIMUM FLOW FOR EACH SPRINKLER.
7. EXTEND AND CONNECT TO 2" CW AT SITE. CONTRACTOR TO COORDINATE WITH CIVIL SITE PLANS FOR EXACT LOCATION.
8. FIELD VERIFY IF EXISTING WATER METER IS INSTALLED AT PROPERTY LINE BY SITE CONTRACTOR, IF NOT PROVIDE NEW WATER METER IN FIRE ROOM



1 PLUMBING SUPPLY PLAN
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PLUMBING SUPPLY PLAN

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P101

GAS PIPING SIZED PER
INTERNATIONAL FUEL CODE-2021 TABLE #402.4(2):
FOR GAS PRESSURE LESS THAN 2 PSI.
PRESSURE DROP: 0.5" W.C.
SPECIFIC GRAVITY: 0.60

GAS METER
TOTAL NEW GAS LOAD: 1,010,000 BTU/HR
MAXIMUM DISTANCE: 280'-0" (V.I.F.)

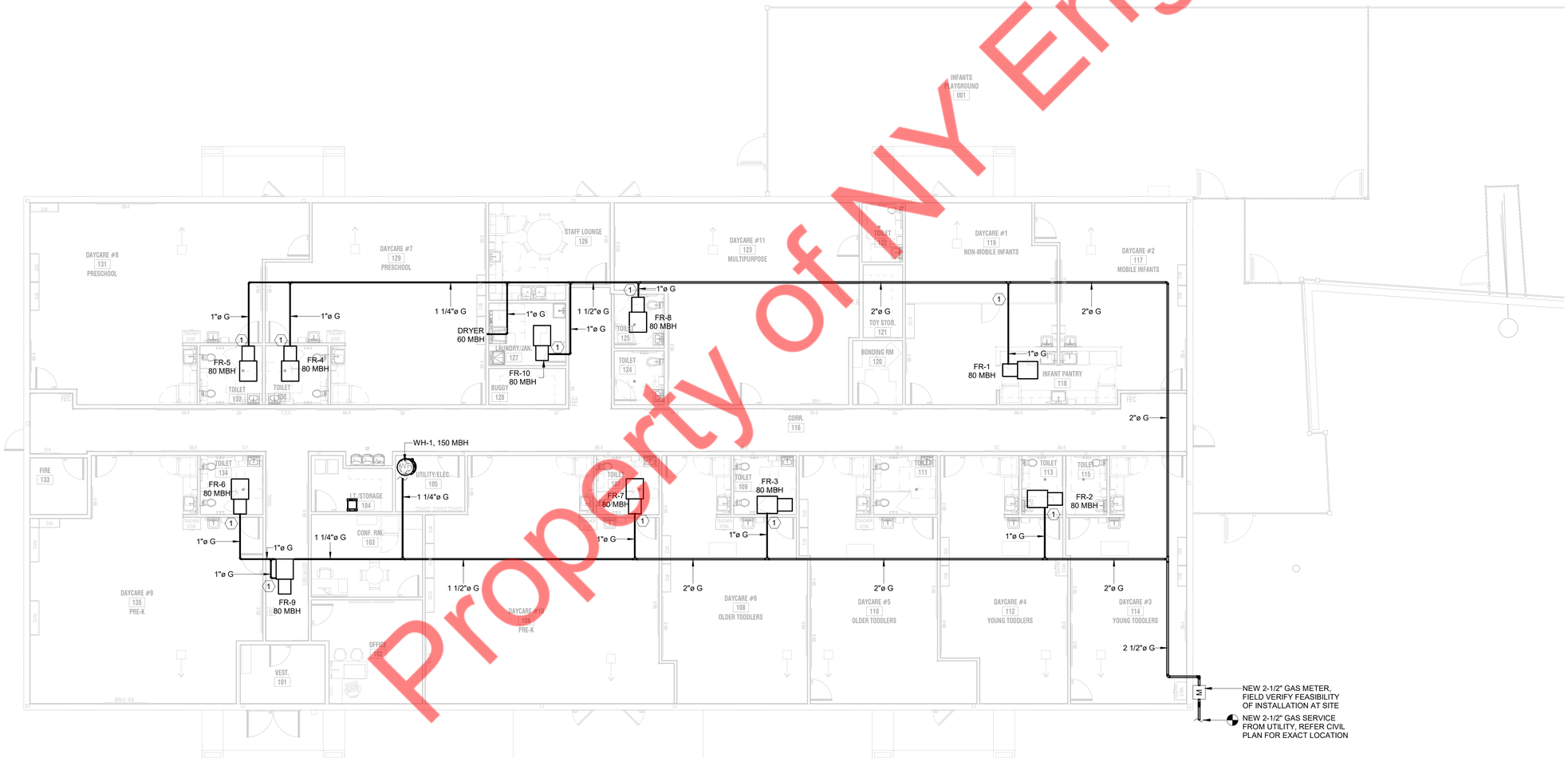
NOTE:
CONTRACTOR TO FIELD VERIFY GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR MECHANICAL EQUIPMENTS.

PROVIDE SHUT-OFF VALVE AN ACCESSIBLE LOCATION.

CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN FROM METER TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN.

KEY NOTES

1. CONTRACTOR SHALL PROVIDE AND INSTALL GAS VALVE, DIRT LEG & UNION AS REQUIRED. CONTRACTOR SHALL PROVIDE AND INSTALL PRESSURE REGULATOR VALVE AT INCOMING SERVICE AND/OR BEFORE TIE-IN TO EQUIPMENT.



1 PLUMBING GAS PLAN
1/8" = 1'-0"

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SHEET TITLE:
PLUMBING ROOF GAS PLAN

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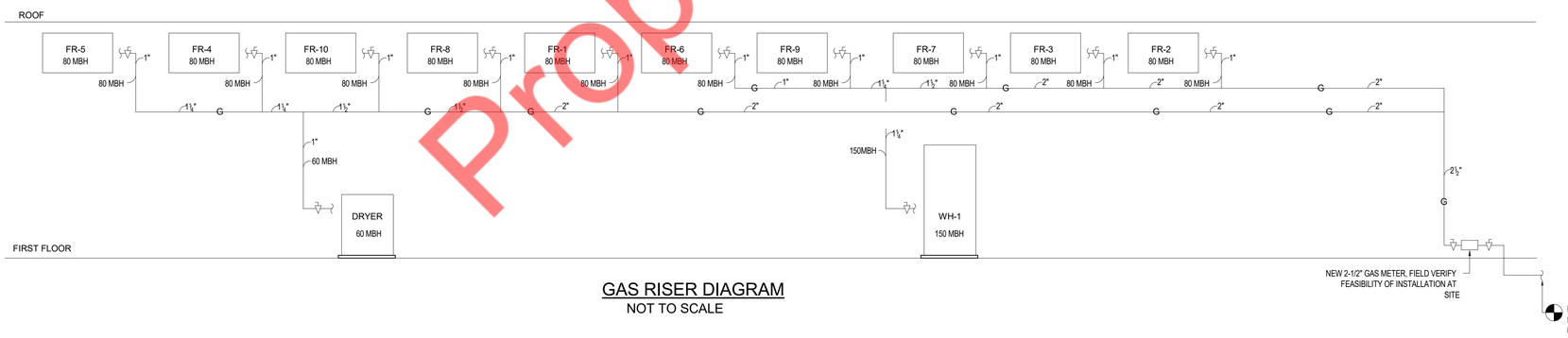
P102

SANITARY WASTE RISER DIAGRAM
NOT TO SCALE

STORM RISER DIAGRAM
NOT TO SCALE



GAS RISER DIAGRAM
NOT TO SCALE

GAS PIPING SIZED PER
INTERNATIONAL FUEL CODE-2021 TABLE #402.4(2):
FOR GAS PRESSURE LESS THAN 2 PSI.
PRESSURE DROP: 0.5" W.C.
SPECIFIC GRAVITY: 0.60

GAS METER
TOTAL NEW GAS LOAD: 1,010,000 BTU/HR
MAXIMUM DISTANCE: 280'-0" (V.I.F.)

NOTE:
CONTRACTOR TO FIELD VERIFY GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR MECHANICAL EQUIPMENTS.

PROVIDE SHUT-OFF VALVE AN ACCESSIBLE LOCATION.

CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN FROM METER TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN.

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PLUMBING RISER DIAGRAMS(1 OF 2)

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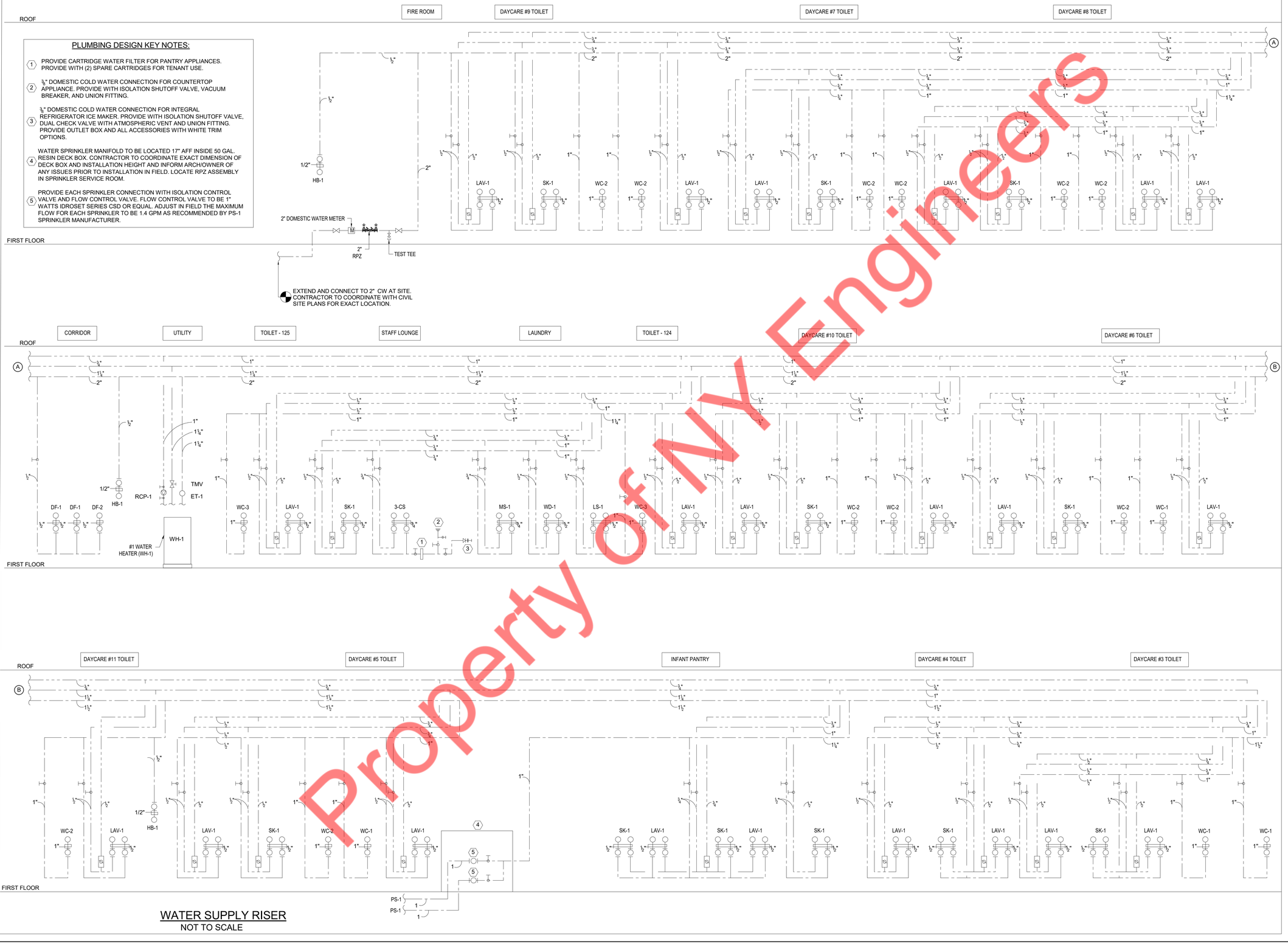
SHEET NO.
P200

PLUMBING DESIGN KEY NOTES:

1. PROVIDE CARTRIDGE WATER FILTER FOR PANTRY APPLIANCES. PROVIDE WITH (2) SPARE CARTRIDGES FOR TENANT USE.
2. ¾" DOMESTIC COLD WATER CONNECTION FOR COUNTERTOP APPLIANCE. PROVIDE WITH ISOLATION SHUTOFF VALVE, VACUUM BREAKER, AND UNION FITTING.
3. ¾" DOMESTIC COLD WATER CONNECTION FOR INTEGRAL REFRIGERATOR ICE MAKER. PROVIDE WITH ISOLATION SHUTOFF VALVE, DUAL CHECK VALVE WITH ATMOSPHERIC VENT AND UNION FITTING. PROVIDE OUTLET BOX AND ALL ACCESSORIES WITH WHITE TRIM OPTIONS.
4. WATER SPRINKLER MANIFOLD TO BE LOCATED 17" AFF INSIDE 50 GAL. RESIN DECK BOX. CONTRACTOR TO COORDINATE EXACT DIMENSION OF DECK BOX AND INSTALLATION HEIGHT AND INFORM ARCHOWNER OF ANY ISSUES PRIOR TO INSTALLATION IN FIELD. LOCATE RPZ ASSEMBLY IN SPRINKLER SERVICE ROOM.
5. PROVIDE EACH SPRINKLER CONNECTION WITH ISOLATION CONTROL VALVE AND FLOW CONTROL VALVE. FLOW CONTROL VALVE TO BE 1" WATTS IDROSET SERIES CSD OR EQUAL. ADJUST IN FIELD THE MAXIMUM FLOW FOR EACH SPRINKLER TO BE 1.4 GPM AS RECOMMENDED BY PS-1 SPRINKLER MANUFACTURER.



WATER SUPPLY RISER
NOT TO SCALE

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SHEET TITLE:
PLUMBING RISER DIAGRAMS (2 OF 2)

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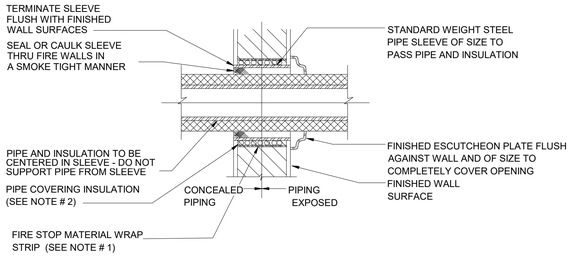
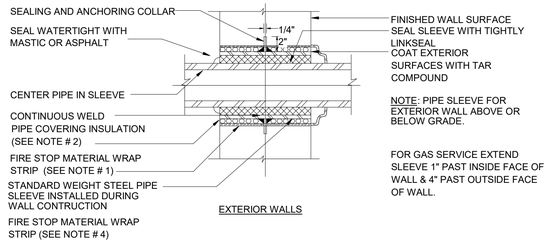


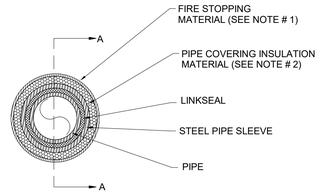
INTERIOR WALLS



EXTERIOR WALLS

NOTE: PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE.

FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL & 4" PAST OUTSIDE FACE OF WALL.



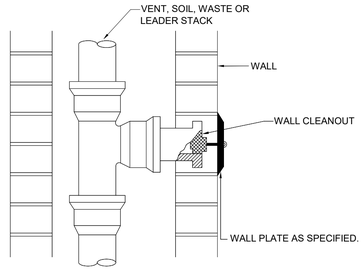
PIPE SLEEVE VIEW

NOTES:

1. FIRESTOP MATERIAL WRAP STRIP SHALL BE 1/4" THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL SUPPLIED IN 2 IN. WIDE STRIPS AND WRAP AROUND THE PIPE AS PER UL MATERIAL LISTED3M COMPANY FS-195+ OR FILL CAVITY WITH CAULK OR SEALANT MIN. 1/4" " DIA. CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED OF THE WRAP STRIP LAYER APPROX. 3/4" FROM WALL SURFACE. AS PER UL LISTED 3M COMPANY CP25WB+, IC 15WB+, FIRE DAM 150+CAULK.
2. PIPE COVERING INSULATION SHALL BE 2" THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKETED. AS PER UL CLASSIFICATION AND MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED

PIPE SLEEVE THRU WALL SECTION

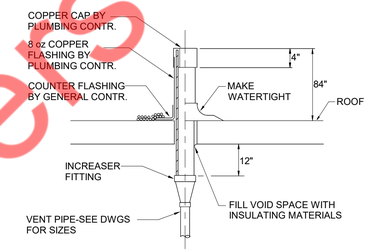
1 / P-300 PIPE SLEEVE THRU WALL SECTION N.T.S



2 / P-300 WALL CLEANOUT DETAIL N.T.S

NOTES:

1. MINIMUM SIZE OF VENT EXTENSION THROUGH ROOF TO BE 4".
2. CHANGE OF DIAMETER TO BE MADE AT LEAST 12" BELOW ROOF.
3. VENT PIPE TO EXTEND up to 7'-0" ABOVE ROOF IN ACCESSIBLE ATERTIGHT BY PROPER FLASHING.
4. ALL VENT RISERS SHALL BE OFFSET AS REQUIRED TO CLEAR ROOF STRUCTURE DUCTWORK OR MECH. ROOF TOP UNITS.
5. 5. PLUMBING CONTRACTOR TO COORDINATE WITH OTHER TRADES.
6. ROOFING CONTRACTOR SHALL SUPPLY BOOT FLASHING FOR RUBBER ROOF SYSTEMS.



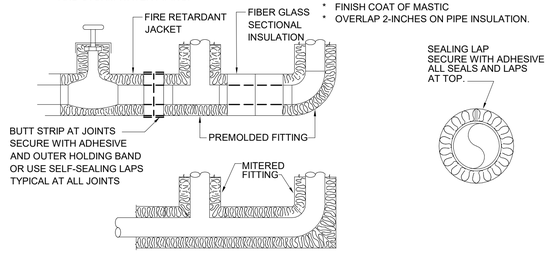
3 / P-300 VENT INCREASER DETAIL N.T.S

CONCEALED VALVES AND FITTINGS

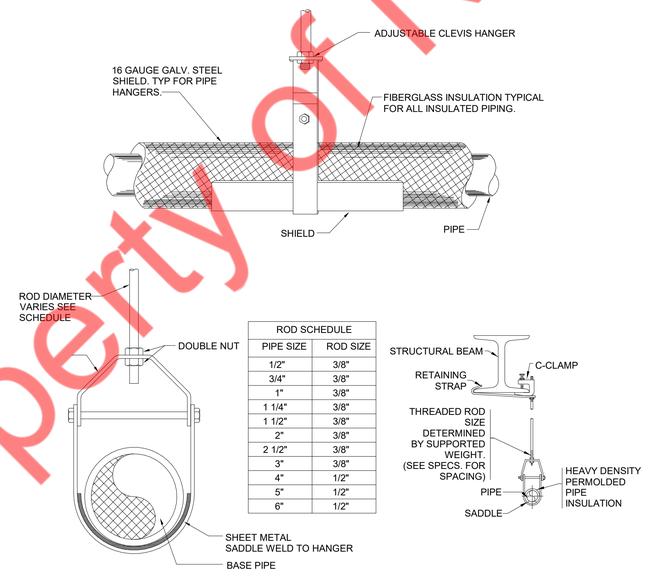
- WRAP WITH 1-INCH THICK, 1-POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS
- SECURE WITH WIRE OR TAPE.
- VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

CONCEALED VALVES AND FITTINGS

- PREMOLDED FIBER GLASS OR RADIAL MITERED PIPE INSULATION
- SKIM COAT OF INSULATION CEMENT
- COAT OF MASTIC
- WRAP WITH FIBER GLASS REINFORCING CLOTH.
- FINISH COAT OF MASTIC
- OVERLAP 2-INCHES ON PIPE INSULATION.

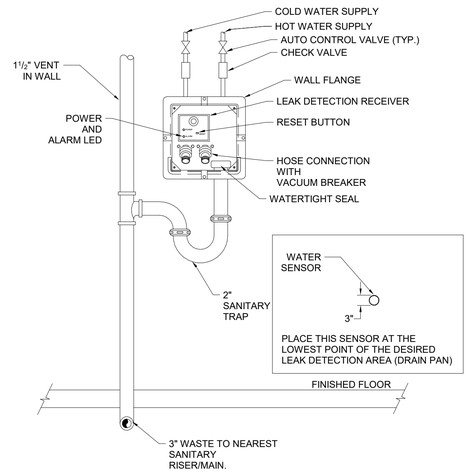


4 / P-300 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS N.T.S



ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"

5 / P-300 HANGER DETAIL N.T.S



MANU.-RELIANCE DETECTION TECHNOLOGIES
MODEL- RS-090-E

6 / P-300 WASHER SUPPLY/ DRAIN BOX DETAIL N.T.S

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PROJECT
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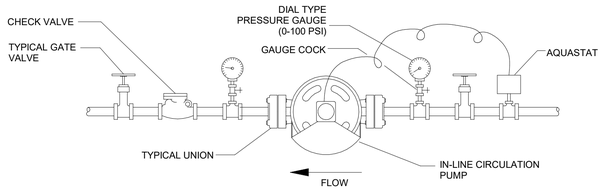
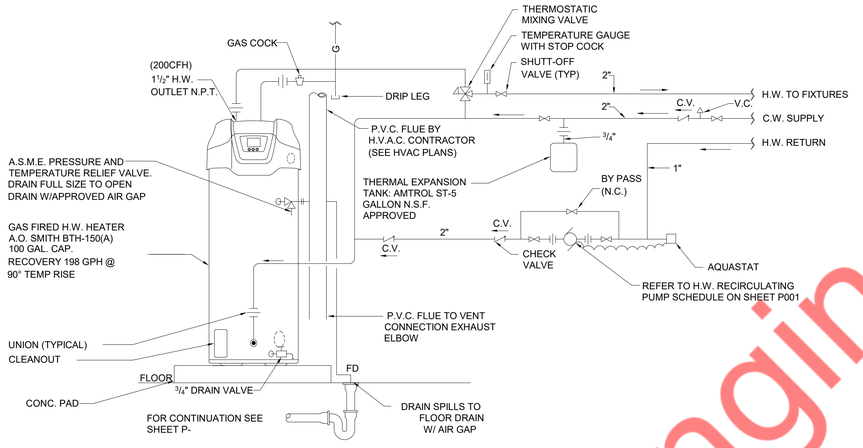
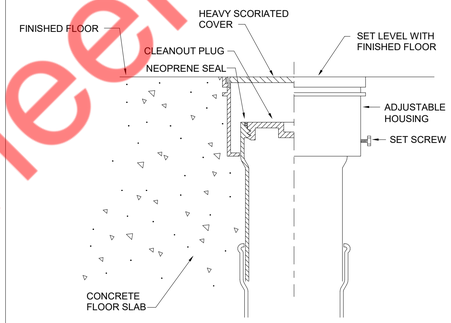


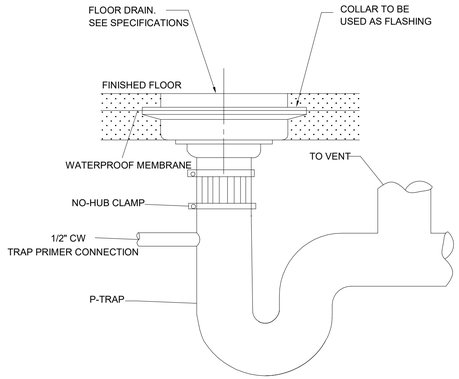
1 P-301 INLINE RECIRCULATING PUMP DETAIL N.T.S



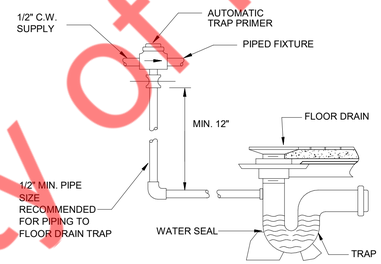
2 P-301 GAS STORAGE HOT WATER HEATER (FLOOR MOUNTED) DETAIL N.T.S



3 P-301 FLOOR CLEANOUT DETAIL N.T.S



4 P-301 FLOOR DRAIN DETAIL N.T.S



5 P-301 FLOW CONTROLED TRAP PRIMER DETAIL N.T.S

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PLUMBING DETAILS (2 OF 2)

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P301

SPRINKLER GENERAL NOTES

1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13-2022 AND ALL LOCAL AUTHORITIES.

2. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.

3. ALL SPRINKLER HEADS SHALL BE INSTALLED AT CENTER OF TILE IF CEILING IS PROVIDED.

4. GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED WHEN FURNITURE/EQUIPMENT IS LESS THAN 18" TO UNDERSIDE OF CEILING.

5. THE SPRINKLER SYSTEMS ARE TO BE HYDROSTATIC TESTED FOR A (2) HOUR MINIMUM AT 200 PSI. PRESSURE AND ARE TO BE WITNESSED BY AUTHORIZED BUILDING PERSONNEL. COORDINATE ALL TESTING WITH BUILDING MANAGER.

6. PIPES SIZES SHOWN ARE BASED ON DESIGN PIPING LAYOUTS ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATIONS BASED ON HIS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN HIS CONTRACT PRICE.

7. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.

8. G.C. SHALL BE RESPONSIBLE FOR ALL FINAL TESTS AND INSPECTIONS OF COMPLETED WORK REQUIRED BY THE BUILDING MANAGEMENT PRIOR TO OCCUPANCY OF SPACE.

9. ALL SPRINKLER WORK SHALL BE TESTED AND MADE OPERATIONAL PRIOR TO CARPET AND FURNITURE INSTALLATION. G.C. SHALL REPAIR AND/OR REPLACE ALL FINISHES DAMAGED BY DEFECTIVE SPRINKLER WORK AT HIS EXPENSE.

10. ALL BURNING, CUTTING, SOLDERING AND WELDING SHALL BE COORDINATED WITH BUILDING FIRE SYSTEMS WITH BUILDING MANAGEMENT, AS REQUIRED.

11. G.C. SHALL BE RESPONSIBLE FOR OBTAINING PERMITS AND APPROVALS REQUIRED BY BUILDING INSPECTOR AND FIRE MARSHALL IN CONJUNCTION WITH CHANGES TO EXISTING SPRINKLER SYSTEM.

12. REFER TO ENGINEERING DRAWINGS FOR SPRINKLER HEADS, LIGHT SENSORS AND FIRE DETECTION DEVICES.

13. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER.

14. UPON COMPLETION OF ALL SPRINKLER WORK, CONTRACTOR SHALL TEST AND INSPECT ENTIRE SPRINKLER SYSTEM. ENTIRE SYSTEM SHALL BE FULLY OPERATIONAL AND APPROVED IN COMPLIANCE WITH ALL AHJ.

15. UPON SUCCESSFUL COMPLETION OF ALL TESTING, CONTRACTOR SHALL PRIME AND PAINT ALL EXPOSED SPRINKLER PIPING. COLOR AND FINISH SHALL BE AS PER ARCHITECT.

16. CONTRACTOR SHALL INCLUDE IN HIS BID THE COST TO PROVIDE (5) FIVE ADDITIONAL SPRINKLERS INSTALLED. EXACT LOCATIONS OF THESE SPRINKLER HEADS SHALL BE DETERMINED IN FIELD.

17. FOR SPRINKLER WORK DONE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13-2022, HYDROSTATIC TESTS IN ACCORDANCE WITH REFERENCE STANDARD NFPA 13-2022, AS MODIFIED FOR TOWN OF ABINGTON, PENNSYLVANIA, ARE NECESSARY.

18. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SHALL INSTALL NEW WORK TO CLEAR DUCTWORK AND LIGHTING FIXTURES.

19. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.

20. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.

21. PIPES SIZES SHOWN ARE BASED ON SCHEDULE OF PIPE SIZE PIPING LAYOUTS ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATIONS BASED ON HIS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN HIS CONTRACT PRICE.

22. PROVIDE AUXILIARY DRAINS AT TRAPPED SECTIONS OF PIPING AS REQUIRED BY NFPA.

23. GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/ EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED WHEN FURNITURE/EQUIPMENT IS LESS THAN 18" TO UNDERSIDE OF CEILING PRIOR TO INSTALLATION.

24. COMPOSITE DRAWINGS

CONTRACTOR SHALL BE GIVEN A SEPIA TRANSPARENCIES TO IMPOSE THEIR WORK FOR A COORDINATED ALLOCATION OF SPACE. PROCEDURE SHALL INCLUDE HVAC CONTRACTOR TO INDICATE DUCT WORK, PIPING, STRUCTURAL AND ARCHITECTURAL DETAILS. SEPIAS SHALL BE GIVEN TO PLUMBING, SPRINKLER AND ELECTRICAL TRADES WHO WILL DRAW HIS WORK ON DRAWINGS. HVAC CONTRACTORS SHALL HOLD A COORDINATION MEETING WITH ALL CONTRACTORS TO ELIMINATE INTERFERENCE OR CONFLICTS IN INSTALLING WORK. IF UNABLE TO EACH AGREEMENT ISSUE, ARCHITECT SHALL MAKE BINDING DECISION.

25. CONTRACTOR SHALL COORDINATE SPRINKLER MAIN AND BRANCHES WITH NEW CONSTRUCTION TO AVOID CONFLICTS WITH CEILING HEIGHTS, DUCTWORK, LIGHTING FIXTURES, BEAMS. CONTRACTOR TO ADJUST PIPING ACCORDINGLY TO ACCOMMODATE NEW CONSTRUCTION.

BUILDING DEPARTMENT SPRINKLER NOTES

1. THE INSTALLATION, COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION AND TYPE OF SYSTEMS SHALL CONFORM TO THE 2024 OHIO BUILDING CODE (IBC 2021) SECTION 903.

2. ONLY APPROVED MATERIALS SHALL BE USED AS PER 2024 OHIO BUILDING CODE (IBC 2021), SECTION 104.9.

3. DIRECT CONNECTION OF SPRINKLERS TO THE PUBLIC WATER SYSTEM SHALL CONFORM TO 2024 OHIO BUILDING CODE (IBC 2021) SECTION 903.3.5

4. SPRINKLER SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER NFPA 13-2022 CHAPTER 8 SECTION 8.6.

5. THE OCCUPANCY OF THE AREAS TO BE SPRINKLERED IN ACCORDANCE WITH 2024 OHIO BUILDING CODE (IBC 2021), SECTION 903.2.

6. PIPING, FITTINGS, SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION, DAMAGE, VALVES, HANGERS, SPRINKLERS GUARDS AND SHIELDS SHALL BE AS PER 2024 OHIO BUILDING CODE (IBC 2021).

7. STOCK OF EXTRA SPRINKLERS WILL BE FURNISHED AS PER NFPA 13-2022 SECTION 16.2.7 (REQUIRED FOR EACH TEMPERATURE RATING).

8. SPRINKLER ALARM SHALL BE IN ACCORDANCE WITH 2024 OHIO BUILDING CODE (IBC 2021), SECTION 907.

9. SPACING, LOCATION AND POSITION OF SPRINKLER WILL BE AS PER 2024 OHIO BUILDING CODE (IBC 2021), SECTION 903.3.

10. ALL BLIND SPACES EXCEEDING 6" IN WIDTH OR DEPTH WHICH CONTAIN COMBUSTIBLE MATERIAL WILL BE SPRINKLERED.

11. ALL PIPE PASSING THROUGH WALLS WILL COMPLY WITH SECTION 2018 PENNSYLVANIA BUILDING CODE, SECTION 714.

12. THERE IS NO HIGH PILED STORAGE AS DEFINED IN 2024 OHIO BUILDING CODE (IBC 2021), SECTION 3201.

13. DISTANCE OF SPRINKLERS FROM HEAT SOURCE SHALL BE AS PER NFPA 13-2022 SECTION 8.3.2.5.

14. THIS APPLICATION IS NOT FILED AS A RESULT OF ACTION BY THE FIRE COMMISSIONER AS AUTHORIZED BY BS & A TO MODIFY THE CERTIFICATE OF OCCUPANCY NOR IS SUCH ACTION PENDING.

15. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY NFPA 13-2022, SECTION 7.6.3.

16. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IS MADE IN THE SIZE OF PIPE, AS PER NFPA 13-2022 SECTION 6.4.7.

17. ALL VALVES ON CONNECTIONS TO WATER SUPPLIES TO SPRINKLER SHALL BE APPROVED O.S. & Y. OR APPROVED INDICATOR TYPE.

18. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER NFPA-13-2022 SECTION 6.6.3.

19. HANGERS SHOULD BE SUPPORTED BY WROUGHT IRON U TYPE OR APPROVED ADJUSTABLE HANGERS. HANGERS SHALL BE OF THE TYPE APPROVED FOR USE WITH THE PIPE OR TUBE INVOLVED, AS PER NFPA-13-2022 SECTION 9.1.

20. TEMPERATURE RATING SHALL COMPLY WITH NFPA-13-2022 SECTION 8.3.2.

21. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER NFPA-13-2022 SECTION 8.5.6

24. MINIMUM BRANCH PIPE SIZE TO BE ONE INCH (1").

25. THIS APPLICATION IS MADE ONLY FOR WORK INDICATED ON THE 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.

26. WET SPRINKLER SYSTEM SUBJECTED TO FREEZING SHOULD COMPLY WITH NFPA 13-2022 SEC. 8.16.4.

27. INSPECTION AND TESTS OF SPRINKLERS SHALL BE CONDUCTED AS PER 2024 OHIO BUILDING CODE (IBC 2021), SECTION 904.4.

SPRINKLER DRAWING LIST

SPACING BETWEEN SPRINKLER HEADS

LIGHT HAZARD: 15' MAX.
ORDNIARY HAZARD: 15' MAX

NOTE: MAXIMUM DISTANCE BETWEEN SPRINKLER HEADS & WALLS IS 1/2 THE DISTANCE BETWEEN HEADS.

PROTECTION AREA OF SPRINKLER HEADS

LIGHT HAZARD	:	225 SQ. FT.
ORDINARY HAZARD	:	130 SQ. FT.

DESIGN CRITERIA SUMMARY:

HYDRAULIC CALCULATIONS FOR CHILDCARE AREA BASED ON THE FOLLOWING:

OCCUPANCY:	ORDINARY I
MINIMUM DESIGN DENSITY:	0.15 GPM/SQ. FT.
DESIGN AREA OF APPLICATION:	1500 SQ. FT.

OCCUPANCY:	LIGHT
MINIMUM DESIGN DENSITY:	0.1 GPM/SQ. FT.
DESIGN AREA OF APPLICATION:	1500 SQ. FT.

GENERAL NOTES:

1. FOR SPRINKLER WORK ONLY
2. ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.
3. PROVIDE FREEZE PROTECTION FOR ALL SPRINKLER PIPING AND EQUIPMENTS SUBJECT TO TEMPERATURE BELOW 40°F.

PERFORMANCE SPECIFICATION CRITERIA:

SPRINKLER PLANS AS SHOWN ARE FOR BIDDING PURPOSES ONLY.
SPRINKLER CONTRACTOR IS TO OBTAIN CURRENT HYDRANT FLOW TEST DATA AND PROVIDE HYDRAULIC CALCULATIONS FOR SYSTEM PIPE SIZING IN ACCORDANCE WITH NFPA 13.
CONTRACTOR IS TO SUBMIT SHOP DRAWINGS INDICATING HYDRAULIC CALCULATIONS, PIPING LAYOUT AND SIZING.
ALL WORK IS TO BE DONE IN ACCORDANCEWITH ALL STATE,LOCAL, GOVERNING AND APPLICABLE CODES.

SPRINKLER LEGEND

SP	NEW SPRINKLER PIPING
●	CONCEALED SPRINKLER HEAD (NEW)
◉	UPRIGHT SPRINKLER HEAD (NEW)
	SPRINKLER CAPPED OUTLET
	PIPE THRU RATED WALL
	POINT OF CONNECTION
WFS	WATER FLOW SWITCH
TS	TEMPER SWITCH

SPRINKLER SCHEDULE

SYMBOL	NAME	COVERAGE	AREA	METAL	TEMPERATURE (°F)	K-FACTOR	NPT	MFG	MODEL NO./ SIN	REMARK
●	CONCEALED PENDENT	STANDARD	CEILING	BRASS	165	5.6	1/2"	TYCO	SERIES RF-II TY3531	FM APPROVED
◉	UPRIGHT	STANDARD	OPEN AREAS	BRASS	165	5.6	1/2"	TYCO	SERIES TY-B TY3151	FM APPROVED

NOTE: 1. COORDINATE ALL SPRINKLER COLOR FINISHES WITH ARCHITECT.
2. ALL SPRINKLER SHOULD BE UL/FM APPROVED

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Lightbridge Academy℠
Innovators in Educational Child Care

PROJECT
INTERIOR FITOUT FOR:
LIGHTBRIDGE ACADEMY

SHEET TITLE:
FIRE PROTECTION COVER SHEET

REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
FP001

SPRINKLER SPECIFICATIONS

PART 1 - GENERAL

1.01 REQUIREMENTS

A. THE SPRINKLER CONTRACTOR SHALL BE A LICENSED, AUTHORIZED INSTALLER OF SPRINKLER SYSTEMS AND SHALL HAVE HAD A MINIMUM OF FIVE YEARS EXPERIENCE IN THE INSTALLATION OF SPRINKLER SYSTEMS IN THE CITY OF CINCINNATI, OH.

B. BEFORE SUBMITTING HIS BID, THE SPRINKLER CONTRACTOR SHALL VISIT THE SITE AND SHALL FULLY FAMILIARIZE HIMSELF WITH, AND BECOME FAMILIAR WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. CONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

C. UPON REVIEW OF THE DRAWINGS AND SPECIFICATIONS, PRIOR TO SUBMITTING HIS PROPOSAL, THE SPRINKLER CONTRACTOR SHALL INFORM ARCHITECT AND/OR ENGINEER OF ANY DISCREPANCIES OR REQUEST CLARIFICATION IN WRITING, IF NECESSARY, CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE SPRINKLER SYSTEM INSTALLATION. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OF MATERIALS SHOULD SUCH PROCEDURE NOT BE FOLLOWED.

D. THE SCHEDULING OF THE SPRINKLER WORK SHALL BE COORDINATED WITH BUILDING MANAGEMENT, WITH OTHER CONTRACTORS AND WITH THE ENGINEER.

E. NECESSARY SHUT-DOWNS OF BASE BUILDING SPRINKLER SYSTEM MUST BE COORDINATED WITH BUILDING MANAGEMENT. SHUT-DOWNS OF BASE BUILDING SYSTEMS SHALL TAKE PLACE AFTER OR BEFORE NORMAL BUSINESS HOURS AND SHALL BE CONSIDERED OVERTIME WORK. THE CONTRACTOR MUST GIVE BUILDING MANAGEMENT AND LOCAL FIRE DEPARTMENT 48 HOURS NOTICE PRIOR TO SHUT-DOWN OF SPRINKLER, OR OTHER SYSTEMS.

1.02 WORK INCLUDED

A. WORK SHALL INCLUDE ALL SPRINKLER WORK FURNISHED AND INSTALLED AS INDICATED ON THE PLANS AND AS SPECIFIED HEREIN.

1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF 2024 OHIO BUILDING CODE (IBC 2021), N.F.P.A. STANDARD 13-2022, LOCAL FIRE DEPARTMENT AND OWNERS INSURANCE RATING ORGANIZATION.

2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. ANY DIMENSIONS NOT SHOWN SHALL BE OBTAINED FROM FIELD MEASUREMENTS.

3. PROVIDE COMPUTER GENERATED HYDRAULIC CALCULATIONS IN ACCORDANCE WITH LOCAL BUILDING DEPARTMENT AND NFPA STANDARDS.

1.03 SHOP DRAWINGS AND SUBMITTALS

A. THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, FULLY COORDINATED SHOP DRAWINGS, CAPACITY, DATA, AND CATALOG CUTS OF THE FOLLOWING:

1. PIPE AND FITTINGS
2. VALVES
3. HANGERS AND SUPPORTS
4. SPRINKLER PIPING LAYOUT
5. TESTS
6. SPRINKLER HEADS
7. HYDRAULIC CALCULATIONS
8. SIAMESE CONNECTION

A. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED. CONTRACTOR SHALL SUBMIT CALCULATIONS WITH SHOP DRAWINGS. CALCULATIONS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF NFPA 13-2022, AND 2024 OHIO BUILDING CODE (IBC 2021).

1.04 BUILDING DEPARTMENT FILING, PERMITS AND CERTIFICATES

A. THE SPRINKLER CONTRACTOR SHALL FILE ALL REQUIRED DRAWINGS AND HYDRAULIC CALCULATIONS WITH THE BUILDING DEPARTMENT AND BE RESPONSIBLE FOR OBTAINING FINAL APPROVAL.

B. ARRANGE FOR INSPECTION AND TESTS OF ANY AND ALL PARTS OF THE WORK AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND PAY ALL CHARGES FOR SAME.

1.05 INSPECTION AND TESTING

A. THE SPRINKLER SYSTEM SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE2024 OHIO BUILDING CODE (IBC 2021) WITH FIRE DEPARTMENT INSPECTOR.

B. THE SPRINKLER SYSTEM SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE TEST FOR A PERIOD OF TWO HOURS AT A PRESSURE OF AT LEAST 200 PSIG OR 50 PSI IN EXCESS OF THE MAXIMUM PRESSURE TO BE MAINTAINED WHEN THE MAXIMUM PRESSURE IN THE SYSTEM IS IN EXCESS OF 150 PSI AS PER NFPA.

C. THE BUILDING DEPARTMENT SHALL BE NOTIFIED THAT THE SYSTEM IS READY FOR REINSPECTION AND TESTING. THE BUILDING DEPARTMENT INSPECTOR SHALL WITNESS THE TEST. FINAL APPROVAL OF THE SPRINKLER SYSTEM SHALL BE OBTAINED FROM BUILDING DEPARTMENT, AND FIRE DEPARTMENT.

PART 2 - MATERIALS

2.01 GENERAL

A. THE SPRINKLER SYSTEM SHALL BE COMPLETE WITH ALL PIPE, FITTINGS, VALVES, DRAINAGE SYSTEM AND VALVES, HANGERS AND SUPPORTS. ALSO, MISCELLANEOUS WORK ITEMS, SUCH AS, SIGNS AS REQUIRED, VALVE TAGS, ETC., AND ALL OTHER RELATED EQUIPMENT, APPARATUS AND MATERIAL ITEMS NECESSARY FOR COMPLETE, APPROVED TYPE SYSTEM, READY FOR FUTURE EXTENSION.

B. ALL PIPE, FITTINGS, HANGERS, SUPPORTS, SPRINKLER HEADS, ETC., SHALL CONFORM TO THE 2024 OHIO BUILDING CODE (IBC 2021) AND NATIONAL FIRE PROTECTION ASSOCIATION'S REQUIREMENTS AS TO TYPES OF MATERIALS, ARRANGEMENT, SIZES AND INSTALLATION. PIPING PENETRATING FIRE RATED PARTITIONS SHALL HAVE OPENING SEALED WITH U.L. APPROVED FIREPROOF SEALANT.

2.02 SPRINKLER PIPING

A. ALL SPRINKLER PIPING SHALL BE SCHEDULE 40, IN ACCORDANCE WITH NFPA 13-2022. PIPE SHALL BE UL/FM APPROVED.

B. STEEL PIPE SHALL BE BETHLEHEM STEEL CO., ALLIED TUBE, BERGER INDUSTRIES OR APPROVED.

C. AS PER NFPA 13-2022 PIPE OR TUBE USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS SPECIFIED IN TABLE 6.3.1.1 OR SHALL BE IN ACCORDANCE WITH 6.3.1.1.

D. AS PER NFPA 13-2022, FITTINGS USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS LISTED IN TABLE 6.4. OR SHALL BE IN ACCORDANCE WITH 6.4. FITTING SHALL BE UL/FM APPROVED. CONTRACTOR.

2.03 CUTTING AND PATCHING

1. DO ALL CUTTING AND CORE DRILLING NECESSARY FOR THE INSTALLATION OF SPRINKLER WORK. ACCURATELY LAYOUT WORK FOR WHICH CUTTING IS REQUIRED. PATCH AND RESTORE ANY DAMAGE WORK TO LIKE NEW CONDITION.

2. FOR REPLACEMENT OF THE WORK REMOVED, MATCH EXISTING IN NATURE, CONSTRUCTION AND FINISH.

3. MAINTAIN THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH COVERED BY THE WORK, REMOVE ALL SURPLUS MATERIALS, TOOLS ETC. AND LEAVE PREMISES CLEAN.

2.04 FIRE STOPPING

INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURERS PUBLISHED DIRECTIONS AND PER FIRE TESTED DESIGNS THAT HAVE BEEN ACCEPTED BY THE APPROPRIATE CODE AUTHORITY HAVING JURISDICTION.

2.05 PHASING

PHASING SHALL BE COORDINATED BETWEEN THE SPRINKLER CONTRACTOR AND GENERAL CONTRACTOR. SPRINKLER INSTALLATION SHALL BE PHASED IN A MANNER WHICH WILL ALLOW FULL OCCUPANCY OF THE EXISTING FACILITY WHILE THE INSTALLATION IS IN PROGRESS.

2.06 ALTERNATES/SUBSTITUTIONS

CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY CONTRACTOR PROPOSED SUBSTITUTIONS OF THE MATERIALS OR METHODS OF INSTALLATION FROM THAT SPECIFIED. THESE ALTERATIONS SHALL BE LISTED ON THE PROPOSAL AS CONTRACTOR ALTERNATIVE.

2.07 LEAK DAMAGE

THE SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE DURING THE INSTALLATION AND TESTING PERIODS OF THE SPRINKLER SYSTEM FOR ANY LOSS OR DAMAGE TO THE WORK OF OTHERS, TO THE BUILDING, IT'S CONTENTS ETC. CAUSED BY LEAKS IN THE EQUIPMENT BY UNPLUGGED OR DISCONNECTED PIPES, FITTINGS ETC. OR BY OVERFLOW, AND SHALL PAY FOR THE NECESSARY REPLACEMENTS OR REPAIRS TO THE WORK OF OTHERS, DAMAGED BY SUCH LEAKAGE.

2.08 INSERTS, HANGERS, ETC.

A. ALL SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED AND SHALL COMPLY WITH THE STANDARDS FOR THE NATIONAL FIRE PROTECTION ASSOCIATION FOR THE INSTALLATION OF SPRINKLER SYSTEMS AND AS REQUIRED BY THE 2018 PENNSYLVANIA BUILDING CODE NEW JERSEY EDITION.

B. HANGERS AND THEIR COMPONENTS SHALL BE FERROUS. HANGERS SHALL BE ADJUSTABLE FLAT IRON TYPE OF CLEVIS TYPE.

C. SPRINKLER PIPING OR HANGERS SHALL NOT BE USED TO SUPPORT NON-SYSTEM COMPONENTS.

D. SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE WHICH MUST SUPPORT THE ADDED LOAD OF THE WATER-FILLED PIPE PLUS A MINIMUM OF 250 LBS. APPLIED AT THE POINT OF HANGING. CONTRACTOR SHALL SUBMIT DETAIL OF SUPPORT FOR REVIEW AND APPROVAL.

E. SPRINKLER PIPING SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SHEATHING.

F. WHEN SPRINKLER PIPING IS INSTALLED BELOW DUCTWORK, PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE, NOT FROM THE DUCTWORK.

G. MAXIMUM DISTANCE BETWEEN HANGERS SHALL NOT EXCEED 12 FT. FOR 1 AND 1-1/4" SIZES NOR 15' FOR SIZES 1-1/2" AND LARGER.

H. EXPANSION SHIELDS FOR SUPPORTING PIPES UNDER CONCRETE CONSTRUCTION MAYBE USED IN A HORIZONTAL POSITION IN THE SIDES OF BEAMS. IN CONCRETE HAVING GRAVEL OR CRUSHED STONE AGGREGATE, EXPANSION SHIELDS MAY BE USED IN THE VERTICAL POSITION TO SUPPORT PIPES 4" OR LESS IN DIAMETER.

2.09 ESCUTCHEONS

PROVIDE ESCUTCHEONS ON ALL EXPOSED PIPING PASSING THROUGH WALLS, PARTITIONS, FLOORS AND CEILINGS. ESCUTCHEON SHALL BE HELD IN PLACE BY INTERNAL TENSION OR SET SCREW.

2.10 AS-BUILT DRAWINGS

PREPARE AND SUBMIT "AS BUILT" DRAWINGS AT THE COMPLETION OF THE PROJECT.

2.11 SPRINKLER HEADS

A. SPRINKLERS SHALL BE RATED FOR ORDINARY TEMPERATURES (135/165 DEG. F) EXCEPT AS REQUIRED NEAR HEATERS OR LOCATIONS WHERE ELEVATED TEMPERATURES MAY NORMALLY BE EXPECTED OR AS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS.

B. SPRINKLER HEADS SHALL BE BY TYCO SPRINKLER CO., INC. MANUFACTURE OR APPROVED EQUAL, UL AND FM APPROVED, AS FOLLOWS:

1. SPRINKLER HEADS IN FINISHED CEILINGS WITH CONCEALED PIPING SHALL BE AUTOMATIC TYCO MODEL TY3531.

2. UPRIGHT SPRINKLER HEADS SHALL BE AUTOMATIC TYCO TY3151.

3. PROVIDE SPARE SPRINKLER EMERGENCY CABINETS CONFORMING TO NFPA 13-2022.

4. SPRINKLER EMERGENCY CABINETS SHALL BE OF TYCO SPRINKLER CO., INC. OR APPROVED EQUAL, UL AND FM APPROVED.

5. CABINET SHALL BE CONSTRUCTED OF 22 GAUGE STEEL WITH PRIME COAT AND MANUFACTURER'S BAKED ENAMEL FINISH IN COLOR SELECTED BY THE ARCHITECT.

6. CABINET SHALL CONTAIN A MINIMUM OF 6 SPRINKLER HEADS OF EACH TYPE EMPLOYED.

2.12 PRESSURE GAUGE

A. ASHCROFT SERIES 1079, OR APPROVED OTHER, 4-1/2" DIAMETER, 0-200 P.S.I. RANGE, 20 P.S.I. INTERVALS.

PART 3 - EXECUTION

3.01 GUARANTEE

A. GUARANTEE FOR A PERIOD OF ONE (1) YEAR FORM THE DATE OF ACCEPTANCE BY THE OWNER, ALL MATERIALS, APPARATUS AND WORKMANSHIP WHETHER FURNISHED BY HIMSELF OR BY HIS SUBCONTRACTORS AND HE SHALL REPLACE OR REPAIR IN A MANNER APPROVED BY THE ARCHITECTS, WITHOUT COST TO THE OWNER, ANY PART OR PARTS OF THE WORK WHICH MAY PROVE DEFECTIVE OR UNSATISFACTORY WITH IN THE PERIOD OF THE GUARANTEE.

3.02 INSTALLATION

A. PIPING

1. INSTALL PIPING AS SHOWN ON THE CONTRACT DRAWINGS AND STRAIGHT AND DIRECT AS POSSIBLE, FORMING RIGHT ANGLES OR PARALLEL LINES WITH BUILDING WALLS, NEATLY SPACED, WITH RISERS PLUMB AND TRUE.

2. SPRINKLER PIPING SHALL BE INSTALLED SO THAT THE SYSTEM CAN BE DRAINED.

3. PIPE SHALL BE REMOVED BY REAMING.

4. BEFORE INSTALLING PIPE, THOROUGHLY CLEAN THE INSIDE FREE OF CUTTING AND FOREIGN MATTER. CUT ALL PIPE SQUARE AND SMOOTH AND MAKE UP ALL JOINTS TO REQUIRED LIMITS.

B. PIPE JOINTS

1. THREADED JOINTS SHALL BE MADE UP OF TIGHT USING PIPE JOINT TEFLON COMPOUND OR TAPE, APPLIED ON THE MALE THREADS ONLY.

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PROJECT
INTERIOR FITOUT FOR:
LIGHTBRIDGE ACADEMY

SHEET TITLE:
FIRE PROTECTION SPECIFICATIONS

REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

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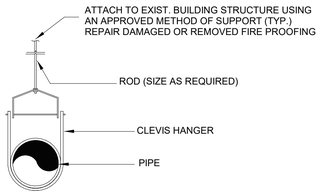
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
FP002



1 FP-003 HANGER DETAILS TYPICAL
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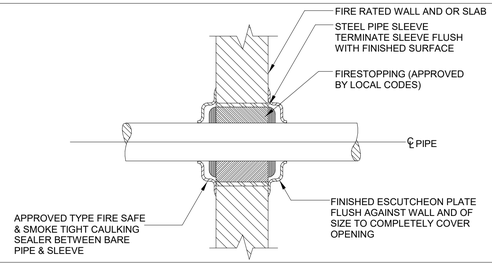

2 FP-003 PIPE THRU RATED WALL TYPICAL DETAIL
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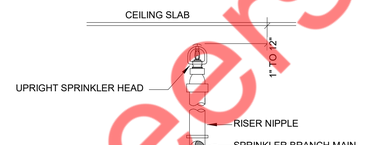
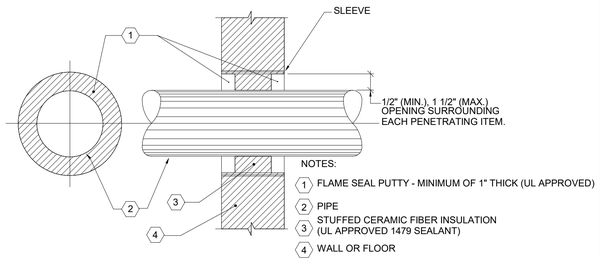
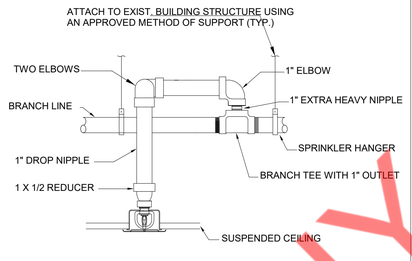


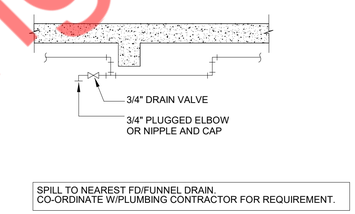
3 FP-003 SPRINKLER HEAD DETAIL UPRIGHT
N.T.S



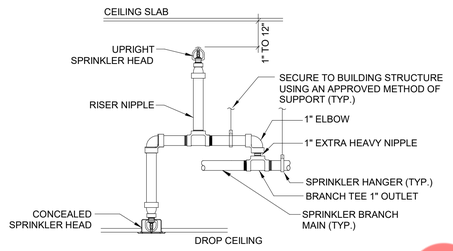
4 FP-003 FIRE STOPPING DETAIL FOR FIRE/SMOKE RATED WALL/FLOOR OPENINGS
N.T.S



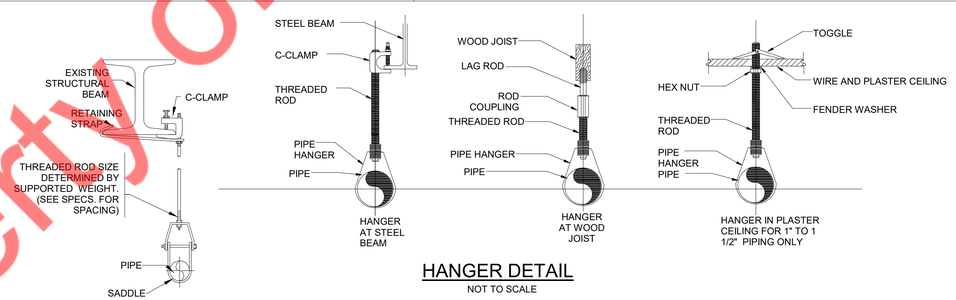
5 FP-003 SPRINKLER HEAD IN SUSPENDED CEILING DETAIL
N.T.S



6 FP-003 TYPICAL DRAIN CONNECTION FOR TRAPPED LINES ON WET PIPE SPRINKLER SYSTEMS
N.T.S



7 FP-003 SPRINKLER PROTECTION ABOVE AND BELOW CEILING
N.T.S



HANGER DETAIL
NOT TO SCALE

ROD SCHEDULE

PIPE SIZE	ROD SIZE	SPACING	PIPE SIZE	ROD SIZE	SPACING	PIPE SIZE	ROD SIZE	SPACING
1"	3/8"	5'-8'	2 1/2"	1/2"	10'-12'	6"	3/4"	12'-15'
1 1/4"	3/8"	6'-10'	3"	1/2"	10'-12'			
1 1/2"	3/8"	8'-10'	4"	5/8"	12'-15'			
2"	3/8"	10'-12'	5"	5/8"	12'-15'			

NOTES:
1. CLEVIS HANGERS REQUIRED ON PIPING LARGER THAN 1"
2. GENERAL PURPOSE HANGERS MAY BE USED ON 1" SPRINKLER PIPING ONLY.

8 FP-003 TYPICAL HANGER DETAIL AND ROD SCHEDULE
N.T.S

NY ENGINEERS
NEARBY ENGINEERS
382 NE 191ST STREET SUITE 49674,
MIAMI, FL 33179
PH-914.257.3455
WWW.NY-ENGINEERS.COM

Lightbridge Academy℠
Innovators in Educational Child Care

PROJECT
INTERIOR FITOUT FOR:
LIGHTBRIDGE ACADEMY

SHEET TITLE:
FIRE PROTECTION DETAILS

REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER: 24002475A
DATE: 06/17/2024
DRAWN BY: NYE
CHECKED BY: NYE

SHEET NO.
FP003

FIRE PROTECTION GENERAL NOTES:

1. THE SPRINKLER SYSTEM SHALL BE DESIGNED TO MEET THE BUILDING CODE AND NFPA-13-2022 REQUIREMENTS. THE LIGHTBRIDGE SCHOOL SPRINKLER SYSTEM EXISTING EQUIPMENT LIKE DEDICATED SHUT OFF VALVE, BACKFLOW PREVENTER AND FLOOR CONTROL ASSEMBLY TO BE FIELD VERIFY.

2. ALL CONSTRUCTION INCLUDING EQUIPMENT AND PIPING SHOULD COMPLY WITH RETURN AIR PLENUM STANDARDS.

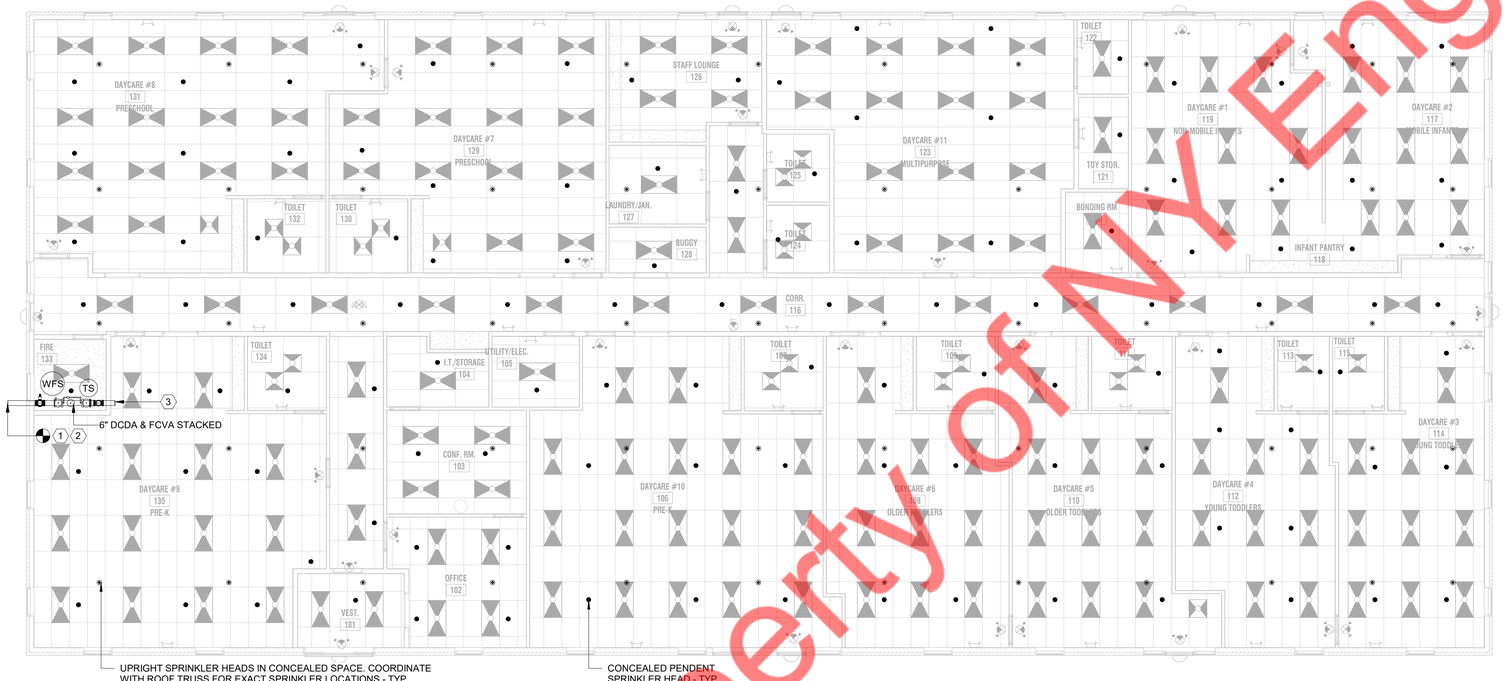
3. ALL SPRINKLER HEADS IN AREA OF WORK TO BE FULLY COORDINATED WITH ALL CEILING ELEMENTS AND ROOF TRUSS IN ADDITION TO WORK FROM OTHER TRADES. CONTRACTOR TO VERIFY PIPE LAYOUT INCLUDING PIPE ROUTING, SIZE, AND SPRINKLER HEAD LOCATIONS.

4. CONTRACTOR TO PROVIDE SPRINKLER HYDRAULIC CALCULATIONS BASED ON HYDRANT FLOW TEST NO OLDER THAN ONE YEAR IN ADDITION TO SHOP DRAWINGS FOR REVIEW AND APPROVAL.

5. CONTRACTOR TO COORDINATE WITH TRUSS & PROVIDE UPRIGHT SPRINKLER AS PER THE REQUIREMENT.

FIRE PROTECTION KEY NOTES:

1. CONNECT TO FIRE SERVICE MAINS, REFER CIVIL PLAN FOR EXACT LOCATION.
2. CONTRACTOR TO CORDINATE WITH CIVIL FOR THE DCDA AND FIRE DEPARTMENT CONECTION LOCATION AND SIZE AS PER NFPA. PROVIDE NEW DCDA AND FIRE DEPARTMENT CONNECTION.
3. CONTRACTOR TO SHOW SPRINKLER BRANCH PIPING & CONNECT IT TO THE MAINS.



1 FIRST FLOOR FIRE PROTECTION PLAN
1/8" = 1'-0"

NY ENGINEERS
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INTERIOR FITOUT FOR:
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REV.	DATE	REMARKS
	09/10/2024	ISSUED FOR PERMIT

JOB NUMBER:	24002475A
DATE:	06/17/2024
DRAWN BY:	NYE
CHECKED BY:	NYE

SHEET NO.
FP101