MECHANICAL SYMBOLS LIST

AC-1 / TXF-1	EQUIPMENT SYMBOL
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN
	SIDEWALL/DUCT MOUNTED GRILLE–SUPPLY
	SIDEWALL/DUCT MOUNTED GRILLE–RETURN
DUCT ACCESSORIES	
VD VD	VOLUME DAMPER W/ ACCESS DOOR
BD	BACKDRAFT DAMPER

CONTROLS AND SENSORS	
T	THERMOSTAT
S	MANUAL ON/OFF SWITCH
T_S	TEMPERATURE SENSOR
DUCTWORK	
=======	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE DUCT
FC FC	FLEXIBLE CONNECTION
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
ø12	ROUND DUCT (DIAMETER)
	ROUND DUCT CROSS SECTION
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
	RETURN AIR RECTANGULAR DUCT CROSS SECTION

MECHANICAL ABBREVIATIONS

AL	ACOUSTIC LINING
CFM	CUBIC FEET OF AIR PER MINUTE
RA	RETURN AIR
RTU	ROOF TOP UNIT
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SG	SUPPLY GRILLE
SA	SUPPLY AIR
VD	VOLUME DAMPER
EF	EXHAUST FAN
KEF	KITCHEN EXHAUST FAN
COP	COEFFICIENT OF PERFORMANCE

SUMMARY OF DESIGN CONDITIONS

CLIMATE:

1. CLIMATE ZONE 5A.
2. COOLING OUTDOOR DESIGN TEMPERATURE (DB): 90.5° F (MASSACHUSETTS, 0.4% ASHRAE 2017 CLIMATE DATA).
3. HEATING OUTDOOR DESIGN TEMPERATURE (DB): 2.6° F (MASSACHUSETTS, 99.6% ASHRAE 2017 CLIMATE DATA).
4. COOLING INDOOR DESIGN TEMPERATURE (DB): 75° F.
5. HEATING INDOOR DESIGN TEMPERATURE (DB): 72° F.
6. INDOOR RELATIVE HUMIDITY: 30% (HEATING), 50% (COOLING).

MECHANICAL DRAWING LIST

M001	MECHANICAL GENERAL NOTES, ABBREVIATIONS & SYMBOLS LIST
M002	MECHANICAL SPECIFICATIONS
M100	MECHANICAL FLOOR AND ROOF PLANS
M500	MECHANICAL DETAILS
M600	MECHANICAL SCHEDULES

MASSACHUSETTS ENERGY CONSERVATION CODE–2020 COMPLIANCE

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE MASSACHUSETTS ENERGY CONSERVATION CODE–2020.

MASSACHUSETTS BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF NINTH EDITION OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IBC 2015, 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 MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015, CHAPTER 4.
3. AS PER C408.2.5 OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IEC 2018, 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 MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IEC 2018, 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 MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IBC 2015, 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 MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015 CHAPTER 4 AND CHAPTER 5:
   A. MECHANICAL VENTILATION – SECTION 403.
   B. SMOKE CONTROL SYSTEMS – SECTION 513.
8. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING – MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015.
   B. DUCT CONSTRUCTION AND INSTALLATION–SECTION 603 OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015.
   C. AIR INTAKES, EXHAUSTS AND RELIEF–SECTION 401 OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015.
   D. AIR FILTERS –SECTION 605 OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015.
   E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS –SECTION 513 OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015.
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 MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015 CHAPTER 4 SECTION 403.3. HVAC SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS AS REQUIRED BY MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015 SECTION 408.2.2.
11. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION 606 MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IMC 2015, TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.
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
   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–8
      WITHIN BUILDING ENVELOPE ASSEMBLY: R–12
      OUTSIDE OF BUILDING R–12
15. A COMMISSIONING PLAN SHALL DEVELOPED BY A LICENSED DESIGN PROFESSIONAL, MECHANICAL ENGINEER OR APPROVED AGENCY.
16. A PRELIMINARY REPORT OF COMMISSIONING TEST PROCEDURES AND RESULTS SHALL BE COMPLETED AND CERTIFIED BY THE LICENSED DESIGN PROFESSIONAL, ELECTRICAL ENGINEER, MECHANICAL ENGINEER OR APPROVED AGENCY AND PROVIDED TO THE BUILDING OWNER OR OWNER'S AUTHORIZED AGENT AS PER MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IEC 2018, C408.2.4
17. MECHANICAL SYSTEMS SHALL BE COMMISSIONED PER MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IEC 2018 C403.2.2, C408.2.1, C408.2.5 FINAL COMMISSIONING REPORT SHALL BE DUE WITHIN 90 DAYS OF RECEIPT OF CERTIFICATE OF OCCUPANCY.
10. 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.
11. 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. MULTI–ROD SHALL BE SIMILAR TO FEE & 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.
12. 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.
13. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
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 BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, 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.

GENERAL HVAC NOTES

GENERAL:

1. PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
4. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
7. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
8. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.
10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
11. LOCATE ALL TEMPERATURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP– AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
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 CONDENSATE DRAIN LINES FROM EACH ROOF TOP 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. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
22. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
23. 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.

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 20' FROM ALL HVAC UNITS SHALL BE LINED WITH 1.5" 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 DISHWASHER, KITCHEN, AND LAUNDRY EXHAUSTS SHALL BE OF 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 GRILL LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
13. ALL 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.

GENERAL NOTES

1. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
2. 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.
3. 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

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.

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.

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.

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. 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 SYSTEMS.
2. MOTORS.

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 SECTION 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–12
OUTSIDE OF BUILDING: R–12

1.4 ITEMS NOT INSULATED:

1. FIBROUS–GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/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,

END OF SECTION 230713

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
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 OF EACH REHEAT COIL AND VAV BOX.

E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3–6 AND AS SHOWN IN FIG. 3–1 AND 3–2 FOR ROUND DUCTWORK.

F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.

1.2 MATERIALS

A. SINGLE–WALL RECTANGULAR DUCTS AND FITTINGS.

B. SINGLE–WALL ROUND AND FLAT–OVAL DUCTS AND FITTINGS.

C. SHEET METAL MATERIALS:

1. GALVANIZED SHEET STEEL.
2. STAINLESS–STEEL SHEETS.
3. ALUMINUM SHEETS.
4. FACTORY–APPLIED ANTI–MICROBIAL COATING.

D. DUCT LINER:

1. FIBROUS GLASS, TYPE I, FLEXIBLE.
   a. WITH ANTI–MICROBIAL EROSION–RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.

E. 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.
6. ROUND DUCT JOINT O–RING SEALS.

1.3 DUCT CLEANING

A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.

B. CLEAN THE FOLLOWING ITEMS:

1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR–HANDLING UNITS.
4. COILS AND RELATED COMPONENTS.
5. RETURN–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

1.4 DUCT SCHEDULE

A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

8. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

SECTION 233713 – DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.

B. MANUFACTURERS: TITUS

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
   a. CARNES.
   b. HART & COOLEY INC.
   c. KRUEGER.
   d. METALAIRE, INC.
   e. NAILOR INDUSTRIES INC.
   f. RUSKIN

C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

C403.4.1 THERMOSTATIC CONTROLS (MANDATORY)

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

EXCEPTION: INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED THAT BOTH OF THE FOLLOWING CONDITIONS ARE MET:

1. THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).

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

C403.4.1.1 HEAT PUMP SUPPLEMENTARY HEAT (MANDATORY)

HEAT PUMPS HAVING SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTARY HEAT OPERATION WHERE THE HEAT PUMP CAN PROVIDE THE HEATING LOAD.

C403.4.1.2 DEADBAND (MANDATORY)

THERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.

EXCEPTIONS:

1.THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.

2.OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.

C403.4.1.3 SETPOINT OVERLAP RESTRICTION (MANDATORY)

THERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS		
NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

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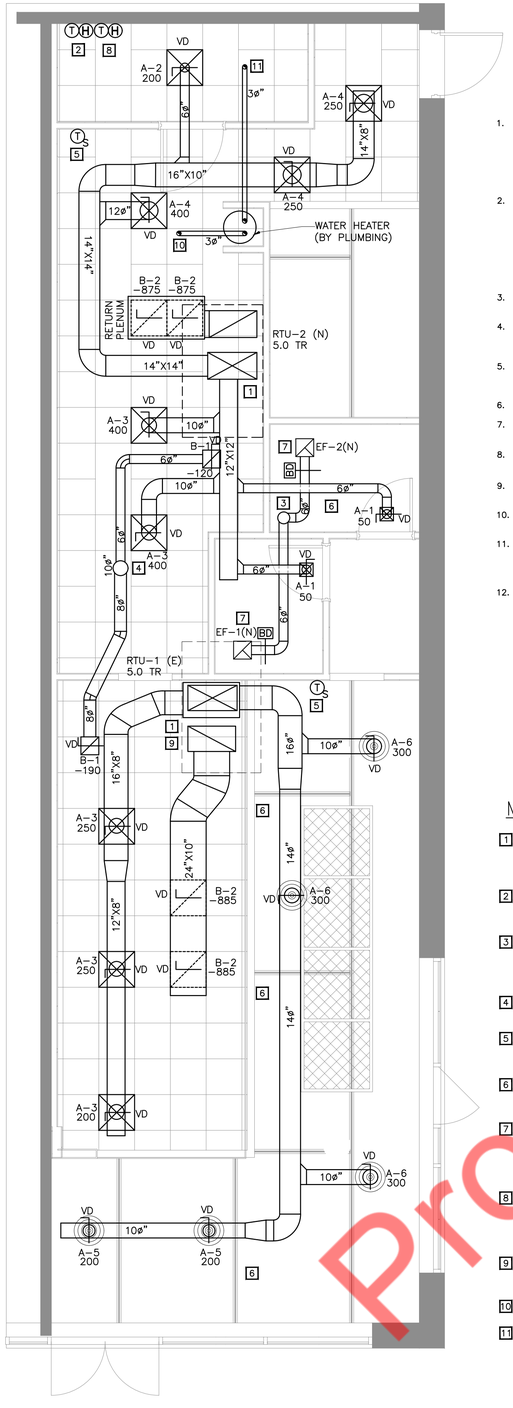
PROJECT NUMBER: 2209

DRAWING NAME:

MECHANICAL SPECIFICATIONS

DRAWING NO.

M002

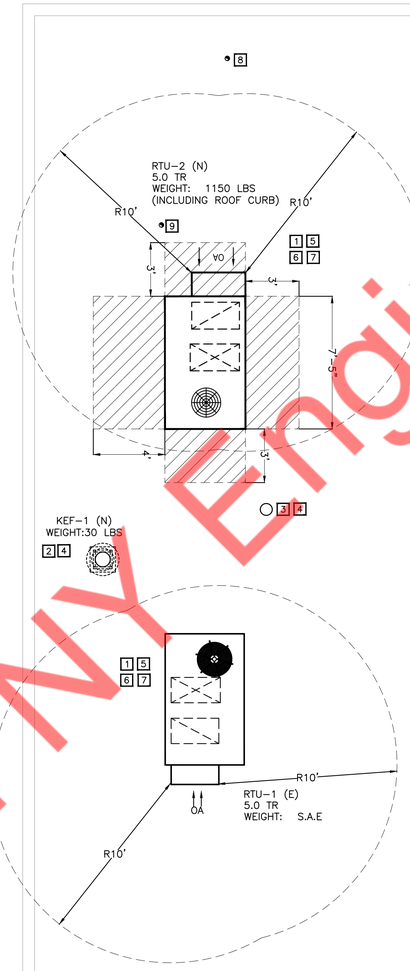


MECHANICAL NOTES

1. BEFORE SUBMITTING BID, VISIT AND CAREFULLY EXAMINE SITE TO IDENTIFY EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT WORK OF THIS SECTION. NO EXTRA PAYMENT WILL BE ALLOWED FOR ADDITIONAL WORK CAUSED BY UNFAMILIARITY WITH SITE CONDITIONS THAT ARE VISIBLE OR READILY CONSTRUED BY EXPERIENCED OBSERVER. SITE VISIT IS PARTICULARLY IMPORTANT BECAUSE THIS IS RENOVATION WORK.
2. BEFORE STARTING WORK IN A PARTICULAR AREA OF THE PROJECT, VISIT SITE AND EXAMINE CONDITIONS UNDER WHICH WORK MUST BE PERFORMED, INCLUDING PREPARATORY WORK DONE UNDER OTHER SECTIONS OR CONTRACTS OR BY OWNER. REPORT CONDITIONS THAT MIGHT AFFECT WORK ADVERSELY IN WRITING THROUGH CONTRACTOR TO ARCHITECT. DO NOT PROCEED WITH WORK UNTIL DEFECTS HAVE BEEN CORRECTED AND CONDITIONS ARE SATISFACTORY. COMMENCEMENT OF WORK SHALL BE CONSTRUED AS COMPLETE ACCEPTANCE OF EXISTING AND PREPARATORY WORK.
3. ALL DUCTWORK SHALL BE SEALED, BOTH TRANSVERSE JOINTS AND LONGITUDINAL SEAMS.
4. INSULATED FLEXIBLE DUCTS ARE ALLOWED AT CONNECTIONS TO SUPPLY DIFFUSERS. FLEXIBLE DUCTS SHALL BE A MAXIMUM OF 5'-0" LONG, AND SHALL BE SUSPENDED OFF OF THE CEILING.
5. ALL CONCEALED SUPPLY, RETURN, AND OUTSIDE AIR DUCTWORK SHALL BE EXTERNALLY INSULATED. INSULATION SHALL PROVIDE A MINIMUM R-VALUE OF R-6.
6. DUCTWORK SHALL NOT BE RUN DIRECTLY ABOVE ELECTRICAL PANELS.
7. CONTRACTOR SHALL PROVIDE START-UP, TESTING, & BALANCING FOR ALL NEW HVAC SYSTEMS.
8. MAINTAIN A MINIMUM OF 10'-0" CLEARANCE BETWEEN OUTSIDE AIR INTAKES AND ALL EXHAUST/PLUMBING VENTS.
9. MAINTAIN EQUIPMENT MANUFACTURER'S REQUIRED SERVICE CLEARANCES FOR ALL MECHANICAL EQUIPMENT.
10. HVAC SYSTEM UTILIZES A PLENUM RETURN AIR SYSTEM. ALL WIRING INCLUDING CONTROL WIRING SHALL BE PLENUM RATED.
11. PROVIDE CEILING ACCESS PANELS AT ALL THE LOCATIONS REQUIRED FOR PROPER ACCESS TO EQUIPMENT, DAMPERS, VALVES, DUCT SMOKE DETECTORS, ETC. COORDINATE ACCESS PANELS WITH ARCHITECT AND G.C.
12. LOCATIONS SHOWN FOR DIFFUSERS & GRILLES ARE DIAGRAMMATIC. EXACT LOCATIONS ARE SUBJECT TO CHANGE BASED ON ACTUAL FIELD CONDITIONS OF EXISTING CEILINGS. COORDINATE CLOSELY WITH ARCHITECT.

MECHANICAL FLOOR PLAN NOTES

1. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNIT TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
2. INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
3. ROUTE 8"ø EXHAUST DUCT UP THROUGH ROOF WITH TALL CONE FLASHING, WEATHER SKIRT, AND VENT CAP. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES AND TERMINATES 36" ABOVE ROOF.
4. 10"ø KITCHEN EXHAUST DUCT UP THRU ROOF TO KEF-1(N)
5. TEMPERATURE/HUMIDITY SENSOR TIED INTO DESIGNATED ROOFTOP UNIT. COORDINATE FINAL REQUIREMENT/LOCATION WITH ARCHITECT / OWNER.
6. CONTRACTOR TO FIELD VERIFY THE SIZE AND LOCATION OF EXISTING DUCTS, IF GOOD IN CONDITION AND SIZES ARE GOOD TO WORK, REUSE EXISTING DUCTWORK.
7. CEILING MOUNTED EXHAUST FAN. INTERCONNECT EXHAUST FAN WITH LIGHTS IN THIS ROOM. REFER TO ELECTRICAL LIGHTING PLAN. FAN SHALL BE SUSPENDED FROM STRUCTURE ABOVE. VERIFY EXACT LOCATION OF STRUCTURAL MEMBERS PRIOR TO INSTALLATION.
8. RELOCATE AND REUSE EXISTING THERMOSTAT,IF EXISTING THERMOSTAT IS NOT IN CONDITION TO REUSE THEN INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN.
9. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING RTU. EXTEND DUCTING AS REQUIRED TO ENSURE PROPER WORKING OF THE SYSTEM.
10. 3"ø WATER HEATER AIR INTAKE PIPE UP THROUGH ROOF.
11. 3"ø WATER HEATER EXHAUST VENT PIPE UP THROUGH ROOF.



MECHANICAL ROOF PLAN NOTES

1. PROVIDE FLEXIBLE CONNECTORS ON SUPPLY AND RETURN DUCT CONNECTIONS. SET OUTSIDE AIR AS INDICATED ON ROOFTOP UNIT SCHEDULES. MECHANICAL CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENT OF OUTSIDE AIR. .CONTRACTOR TO FILED VERIFY EXACT LOCATION OF EXISTING RTU.
2. ROOF MOUNTED KITCHEN EXHAUST FAN AND FAN CURB ARE OWNER PROVIDED. COORDINATE INSTALLATION OF FAN WITH LANDLORD AND EXISTING CONDITIONS TO ENSURE THAT EXHAUST OUTLETS SHALL BE LOCATED NOT LESS THAN 10 FT. HORIZONTALLY FROM OR NOT LESS THAN 3 FT. ABOVE AIR INTAKE SOURCE
3. 8" EXHAUST DUCT UP THROUGH ROOF WITH TALL CONE FLASHING, WEATHER SKIRT, AND VENT CAP. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES AND TERMINATE 36" ABOVE ROOF.
4. CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY INTAKE SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM THE KEF-1(N) AND OTHER EXHAUST DUCT TERMINATING ON ROOF.
5. CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM THE RTU-1(E)& RTU-2(N).
6. CONDENSATE DRAIN LINE SHALL BE CONFIGURED TO PERMIT THE CLEARING OF BLOCKAGE AND PERFORMANCE OF MAINTENANCE WITHOUT REQUIRING THE DRAIN LINE TO BE CUT.
7. CONDENSATE WASTE AND DRAIN LINE SIZE SHALL NOT BE LESS THAN 3/4" INTERNAL DIAMETER AND SHALL NOT DECREASE IN SIZE FROM THE DRAIN PAN CONNECTION TO THE PLACE OF DISPOSAL.
8. 3"ø WATER HEATER FLUE PIPE UP THROUGH ROOF WITH VENT CAP. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKE AND TERMINATES 36" ABOVE ROOF.
9. 3"ø WATER HEATER AIR INTAKE PIPE UP THROUGH ROOF WITH VENT CAP. MAINTAIN A MINIMUM OF 10'-0" FROM ALL EXHAUST AIR VENTS AND TERMINATES 36" ABOVE ROOF.

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

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

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

LIVS JUICE - WOBURN

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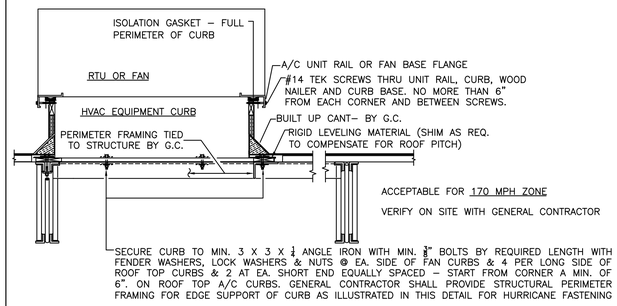
PROJECT NUMBER: 2209

DRAWING NAME:

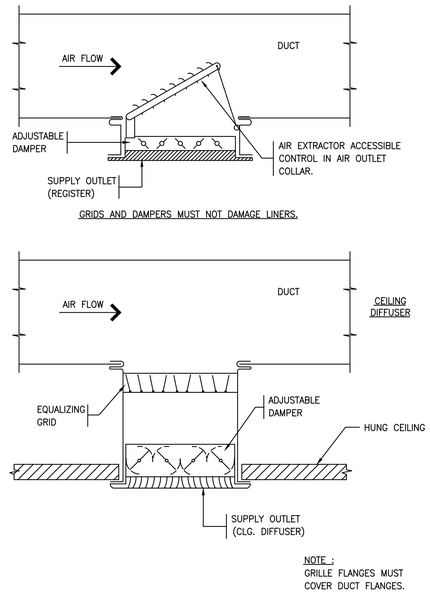
MECHANICAL FLOOR AND ROOF PLANS

DRAWING NO.

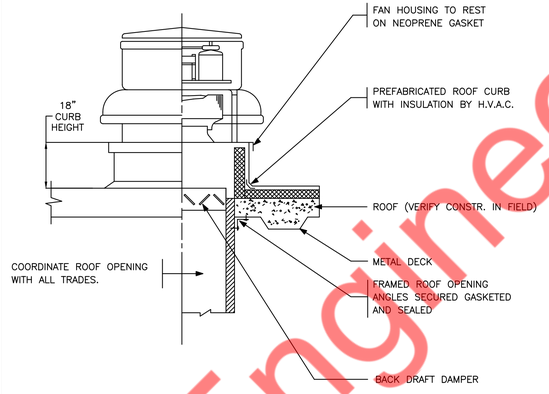
M100



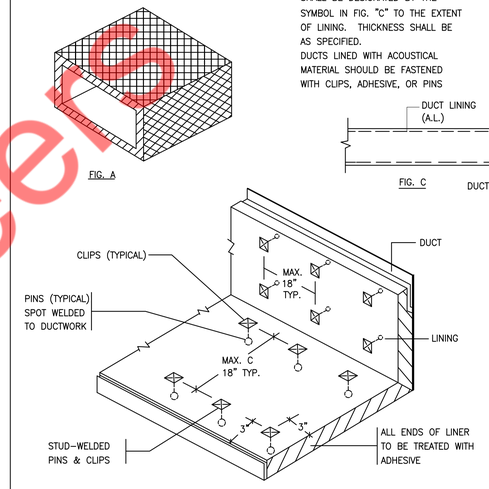
1 / M500 ROOF TOP UNIT INSTALLATION DETAILS
N.T.S



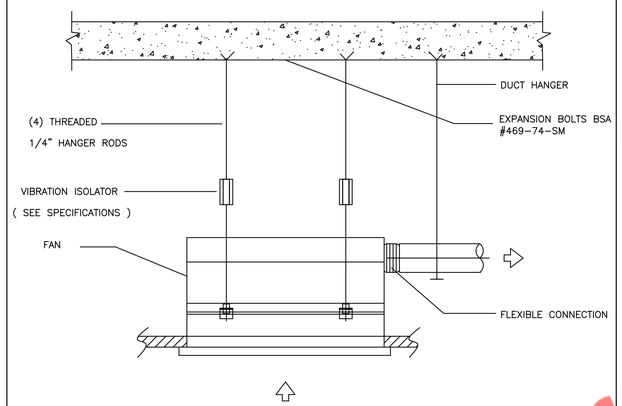
2 / M500 DIFFUSER AND REGISTER CONNECTIONS
N.T.S



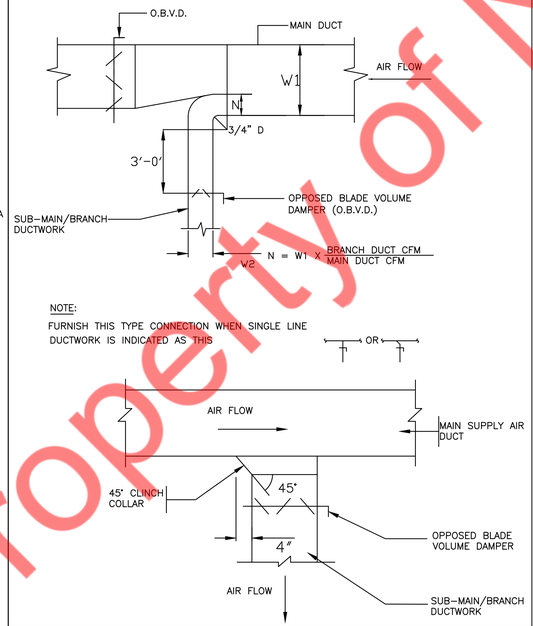
3 / M500 ROOF EXHAUST FAN DETAIL
N.T.S



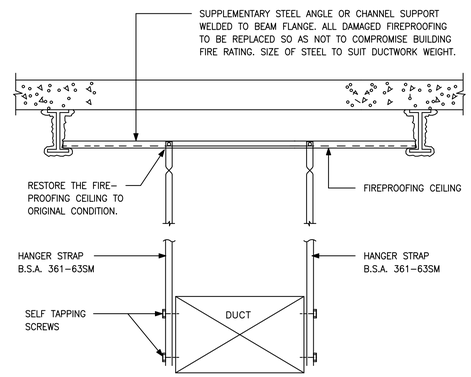
4 / M500 ACOUSTICAL TREATMENT DUCT LINING
N.T.S



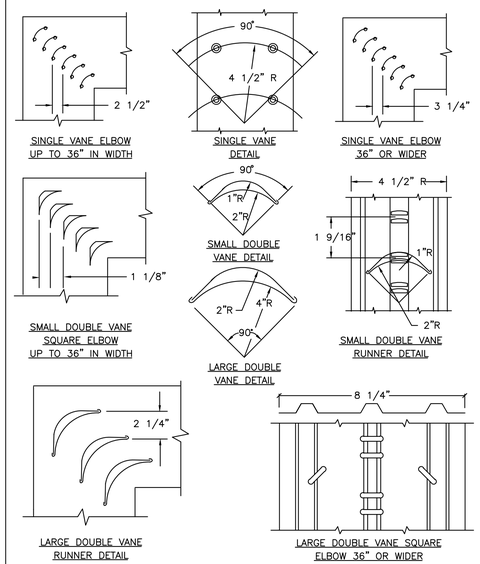
5 / M500 CEILING FAN HANGING SUPPORT DETAIL
N.T.S



6 / M500 SUB–MAIN/BRANCH DUCT CONNECTION
N.T.S



7 / M500 METHOD OF HANGING DUCTWORK
N.T.S



8 / M500 LOW VELOCITY DUCTWORK ELBOWS
N.T.S

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

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MECHANICAL DETAILS

DRAWING NO.

M500

ROOF TOP UNIT SCHEDULE

UNIT TAG	TR	SUPPLY AIRFLOW (CFM)	OUTSIDE AIR (CFM)	ESP (IN. OF W.C.)	SUPPLY FAN H.P.	MCA/MOP (AMPS)	V/PH/HZ	COOLING CAPACITY		HEATING CAPACITY		GAS PRESS. INCH OF WC	MANUFACTURER & MODEL NO.	THERMAL EFFICIENCY	EER / SEER	WEIGHT (LBS.)	REMARKS
								TOTAL (MBH)	SENSIBLE (MBH)	MBH INPUT	MBH OUTPUT						
RTU-1 (E)	5.0	2000	230	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	1-7
RTU-2 (N)	5.0	2000	250	1.0	1	30/45	208/3/60	63.5	47.3	80	64	4.0/14.0	TRANE-YHC060 (OR EQUIVALENT)	80%	14.2/12.6	1150	8-16

NOTES:

1. S.A.E : SAME AS EXISTING.
2. EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
3. CONTRACTOR TO CONFIRM IF EXISTING RTU IS WORKING AT ITS 100% RATED CAPACITY.
4. CONTARCTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTU ON SITE.
5. IF REQUIRED PROVIDE NEW THERMOSTAT AND TEMPRATURE SENSOR COMPATIBLE WITH EXISTING RTU. CO-ORDINATE FINAL LOCATION OF T-SENSOR WITH ARCHITECT/OWNER.
6. CONTARCTOR TO RE-BALANCE OUTISIDE AIR & RETURN AIR DAMPERS ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.
7. REPLACE FILTERS, IF REQUIRED
8. PROVIDE DISCONNECT SWITCH.
9. NON-POWERED GFI OUTLET.
10. HINGED ACCESS PANELS AND EXTERNAL GAUGE PORTS/PRESSURE RESETS.
11. 14" ROOF CURB.
12. BOTTOM SUPPLY AND RETURN DUCTS.
13. PROVIDE 7-DAYS PROGRAMMABLE THERMOSTAT. ALL T-STAT & H-STAT PROVIDED WITH LOCKING COVERS.
14. IF PROVIDED HOT GAS BYPASS SYSTEM, THEN CAPACITY OF HOT GAS BYPASS SHALL BE LIMITED TO 50% OF TOTAL UNIT CAPACITY.
15. ECONOMIZER WITH FDD. BAROMETRIC RELIEF DAMPER.
16. CONTRACTOR TO COORDINATE WITH MANUFACTURER FOR GAS PRESSURE REQUIREMENTS OF RTUS. PROVIDE LOW PRESSURE GAS KIT/SWITCH IF REQUIRED.

EXHAUST FAN SCHEDULE

TAG	QTY.	FLOW RATE	TYPE	STATIC PRESSURE	ELECTRIC DATA				BASIS OF DESIGN		NOTES
				EXTERNAL	SPEED	WATT	HP	V/PH/HZ			
		CFM		IN W.G.	RPM				MANUFACTURER	MODEL	
KEF-1 (N)	1	310	ROOF	0.7	1564	-	1/6	115/1/60	GREENHECK	G-095-VG	1,2,3,4
EF-1 (N)	1	70	CEILING	0.25	950	17	-	115/1/60	GREENHECK	SP-A110	1,3,4
EF-2 (N)	1	70	CEILING	0.25	950	17	-	115/1/60	GREENHECK	SP-A110	1,3,4

NOTES:

1. PROVIDE ALL MANUFACTURER RECOMMENDED ACCESSORIES.
2. FAN SHALL CONTROLLED BY A TIMECLOCK. TIME CLOCK SHALL BE FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR, SCHEDULE FAN TO RUN CONTINOUSLY DURING OCCUPIED MODE AND REMAIN OFF DURING UNOCCUPIED MODE.
3. DISCONNECT SWICH.
4. FAN SHALL BE INTEGRATED WITH OCCUPANCY SENSOR.

MECHANICAL AIR TERMINAL DEVICES SCHEDULE

TAG	SIZE (IN.)	DESCRIPTION	BLOW PATTERN	CONSTRUCTION	BASIS OF DESIGN			NOTES
					BRANCH DUCT(IN)	MANUFACTURER	MODEL	
A-1	9X9	SQUARE CEILING DIFFUSER	3-WAY	STEEL	6Ø	TITUS	TDC	1,3,4
A-2	24X24	SQUARE CEILING DIFFUSER	2-WAY	STEEL	6Ø	TITUS	TDC	1,3,4
A-3	24X24	SQUARE CEILING DIFFUSER	4-WAY	STEEL	10Ø	TITUS	TDC	1,3,4
A-4	24X24	SQUARE CEILING DIFFUSER	4-WAY	STEEL	12Ø	TITUS	TDC	1,3,4
A-5	20Ø	ROUND CEILING DIFFUSER	-	STEEL	8Ø	TITUS	TMRA-AA	1,3,4
A-6	20Ø	ROUND CEILING DIFFUSER	-	STEEL	10Ø	TITUS	TMRA-AA	1,3,4
B-1	12X12	EXHAUST GRILLE	-	STEEL	-	TITUS	350RL	2,3,4
B-2	24X24	RETURN GRILLE	-	STEEL	-	TITUS	350RL	2,3,4

NOTES:

1. CEILING DIFFUSER, LOUVERED, FLUSH FACE, SQUARE/RECTANGULAR NECK, SQUARE/RECTANGULAR FACE, DIRECTIONAL BLOW STEEL WHITE.
2. RETURN/EXHAUST/TRANSFER GRILLE, 35 DEG FIXED BLADES ON 3/4" CENTERS, BLADES PARALLEL TO LONG DIMENSION ALUMINUM, WHITE.
3. PROVIDE A DUCT MOUNTED VOLUME DAMPER WEATHER OR NOT A DUCT MOUNTED VOLUME DAMPER IS INDICATED O PLAN.
4. COORDINATE FINAL COLOR/FINISH WITH ARCHITECT/OWNER.

VENTILATION CALCULATION RTU-1(E)

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000 SQ.FT. AS PER MMC 2015	NUMBER OF PEOPLE AS PER MMC 2015	NUMBER OF CHAIRS	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER MMC 2015		REQ. OA (CFM)	PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM/FITXTURE OR CFM/SQ.FT.)	TOTAL EXHUAST (CFM)
						CFM/PEOPLE	CFM/SQ.FT				
GRAB AND GO	497	70	35	10	10	7.5	0.18	165	230	0	0
PICK UP	272	30	9	3	3	7.5	0.12	66		0.7	190
TOTAL	**-**	**-**	**-**	**13**	**13**	**-**	**-**	**221**	**230**	**-**	**190**

VENTILATION CALCULATION RTU-2(N)

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000 SQ.FT. AS PER MMC 2015	NUMBER OF PEOPLE AS PER MMC 2015	NUMBER OF CHAIRS	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER MMC 2015		REQ. OA (CFM)	PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM/FITXTURE OR CFM/SQ.FT.)	TOTAL EXHUAST (CFM)
						CFM/PEOPLE	CFM/SQ.FT				
PREP	172	0	0	3	3	0	0	0	250	0.7	120
OFFICE/UTILITY	78	5	1	1	1	5	0.06	10		0	0
STORAGE	215	0	0	0	0	0	0.06	13		0	0
TOILET-1	50	0	0	0	0	0	0	0		0	70
TOILET-2	45	0	0	0	0	0	0	0		0	70
TOTAL	**-**	**-**	**-**	**4**	**4**	**-**	**-**	**23**	**250**	**-**	**260**

AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU -1 (E)	SEE PLAN	2000 CFM	230 CFM	1770 CFM	-
RTU -2 (N)	SEE PLAN	2000 CFM	250 CFM	1750 CFM	-
KEF-1 (N)	SEE PLAN	-		-	310 CFM
EF-1 (N)	RESTROOMS	-	-	-	70 CFM
EF-2 (N)	RESTROOMS	-	-	-	70 CFM
	TOTAL:	4000 CFM	480 CFM	3520 CFM	450 CFM
	BUILDING PRESSURE:	.....		30 CFM	**POSITIVE**

NOTE: 1. CONTRACTOR TO REBALANCE OUTSIDE AIR AND RETURN AIR DAMPERS ON RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.

ENGINEER:

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MECHANICAL SCHEDULES

DRAWING NO.

M600

ELECTRICAL SYMBOLS LIST

LIGHTING

	LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
A	LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE SCHEDULE.
2	CIRCUIT NUMBER : INDICATED BY NUMBER
a	SWITCHING INDICATED BY LOWER CASE LETTERS.
EM	DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.
NL	DENOTES FIXTURES DESIGNATED AS NIGHTLIGHT, WIRED TO 24 HOURS UNSWITCHED CIRCUIT.
	CEILING/WALL MOUNTED SELF POWERED EXIT LIGHT FIXTURE WITH DIRECTIONALARROWS AS INDICATED. SHADED AREA DENOTES FACE(S). ISOLITE ELITE SERIES LED EXIT SIGN

SWITCHES AND CONTROLS

$a	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE/SWITCHED RECEPTACLE CONTROLLED.
$3 a	20A 3-WAY TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED
OS A	CEILING OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE. 'A' LETTER REFERES TO WIRING DIAGRAM.

WIRING SYSTEMS

3 5 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3 5 7 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	CONDUIT AND WIRE TO BUILDING GROUND.
	UNDERGROUND
	EXISTING
	NEW

ELECTRICAL DRAWING LIST

E001	ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES
E002	ELECTRICAL SPECIFICATIONS SHEET 1 OF 2
E003	ELECTRICAL SPECIFICATIONS SHEET 2 OF 2
E100	ELECTRICAL LIGHTING PLAN
E101	ELECTRICAL POWER PLAN
E200	ELECTRICAL DETAILS
E300	ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE
A	SIMPLEX RECEPTACLE, +18" AFF OR AS NOTED. SUFFIXE DENOTES FOLLOWING: A- NEMA 5-15R B- NEMA 6-15R C- NEMA 14-30R D- NEMA 14-50R
GFI	DUPLEX GFI RECEPTACLE
	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
	SPECIAL RECEPTACLE AS NOTED
	DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.
	TELEPHONE OUTLET

MOTORS AND CONTROLS

M	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
M WP	AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.
	NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.
A	30A/208V NON FUSED DISCONNECT SWITCH
B	60A/208V NON FUSED DISCONNECT SWITCH
C	100A/208V NON FUSED DISCONNECT SWITCH
D	200A/208V NON FUSED DISCONNECT SWITCH
400 350	FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.
M M	DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.
1.5 kW	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING
$T	THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.
$	MANUAL MOTOR SWITCH

ANNOTATION

X	KEYED NOTE REFERENCE
+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
1 E/2-1	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

POWER DISTRIBUTION

	MAJOR ELECTRICAL COMPONENT OR DEVICE. VOLTAGE AND AMPERAGE AS NOTED.
	DISTRIBUTION PANELBOARD, 120/208V OR AS NOTED-SURFACE OR FLUSH MOUNTED.

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EM	EMERGENCY
AF	AMPERE FRAME/AMP FUSE	EMT	ELECTRICAL METALLIC TUBING
AFF	ABOVE FINISHED FLOOR	EQUIP	EQUIPMENT
AS	AMP SWITCH	ER	EXISTING TO BE RELOCATED
AIC	AMPS INTERRUPTING CAPACITY	FA	FIRE ALARM
AT	AMP TRIP	E	EXISTING
ATS	AUTOMATIC TRANSFER SWITCH	FL	FLOOR
AUTO	AUTOMATIC	G	GROUND
AWG	AMERICAN WIRE GAUGE	GFI	GROUND FAULT INTERRUPTER
C	CONDUIT	GP	GENERAL PURPOSE
C/B,CB	CIRCUIT BREAKER	HP	HORSEPOWER
CKT	CIRCUIT	HWH	HOW WATER HEATER
CLG	CEILING	HZ	HERTZ
COMM	COMMUNICATION	IC	INTERRUPTING CAPACITY
CT	CURRENT TRANSFORMER	PP	POWER PANEL
CU	COPPER	PWR	POWER
DIA	DIAMETER	R	REMOVE
DISC	DISCONNECT	RE	RELOCATED EXISTING
DN	DOWN	REC	RECEPTACLE
DP	DISTRIBUTION PANEL	RGS	RIGID GALVANIZED STEEL
DWG	DRAWING	RR	REMOVE & RELOCATE
JB	JUNCTION BOX	SECT	SECTION
KCMIL	ONE THOUSAND CIRCULAR MILS	SPDT	SINGLE POLE DOUBLE THROW
KV	KILOVOLT	SPST	SINGLE POLE SINGLE THROW
KVA	KILOVOLT-AMPERES	SPEC	SPECIFICATION
KW	KILOWATTS	SW	SWITCH
LTG	LIGHTING	SWBD	SWITCHBOARD
MAX	MAXIMUM	SYM	SYMMETRICAL
MC	MOTOR CONTROLLER	SYS	SYSTEMS
MCB	MAIN CIRCUIT BREAKER	TELE	TELEPHONE
MLO	MAIN LUGS ONLY	TEMP	TEMPERATURE
MTD	MOUNTED	TXF	TOILET EXHAUST FAN
MTS	MANUAL TRANSFER SWITCH	TYP	TYPICAL
N	NEUTRAL	UON	UNLESS OTHERWISE NOTED
NIC	NOT IN CONTRACT	V	VOLT/VOLTAGE
NTS	NOT TO SCALE	VA	VOLT AMPERE
PNL	PANEL	WP	WEATHER PROOF
W	WATT	ø	PHASE

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE ADOPTED VERSION OF THE NEC, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEAL ED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITRH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS		
NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

PROJECT NUMBER: 2209

DRAWING NAME:

ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES

DRAWING NO.

E001

ELECTRICAL SPECIFICATIONS

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," , 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 HIS 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. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.

E. 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.

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

G. 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.

H. 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 ND 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.

I. 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.

J. 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.

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

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

M. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED 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 OWNER. 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) CURRENT CHARACTERISTICS:

a. SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

b. DISTRIBUTION: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

4) 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.

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 LAMICOID 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 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 THE 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 ILLINOIS BUILDING CODE. 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 MAXIMUM 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 QMR. 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 A ND 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) 120/208 VOLTS, 225–AMP FRAME: 22,000 AMPS MINIMUM

8. 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, RMS 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 "QMR", 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).

M. 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.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIV'S JUICE - WOBURN

REVISIONS

NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

PROJECT NUMBER: 2209

DRAWING NAME:

ELECTRICAL SPECIFICATIONS SHEET 1 OF 2

DRAWING NO.

E002

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 265/460 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.

N. 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.

O. 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).

P. 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.

Q. 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.

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

S. 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.

9. 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. COLOR CODING SHALL BE AS FOLLOWS:

120/208 VOLT SYSTEM:
BLACK FOR A PHASE
RED FOR B PHASE
BLUE 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.

G. 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.

H. 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.

I. 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 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

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

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

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.

10. 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, 120/208 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,

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.

11. 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. 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.

12. 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.

13. GROUNDING AND BONDING:

A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH (2017) NATIONAL ELECTRICAL CODE), AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.

B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.

C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.

D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.

E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:

1) CIRCUITS SERVING ANY WALL BOX DIMMER.

2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE , OR AS OTHER WISE NOTED ON DRAWINGS.

3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES

4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS

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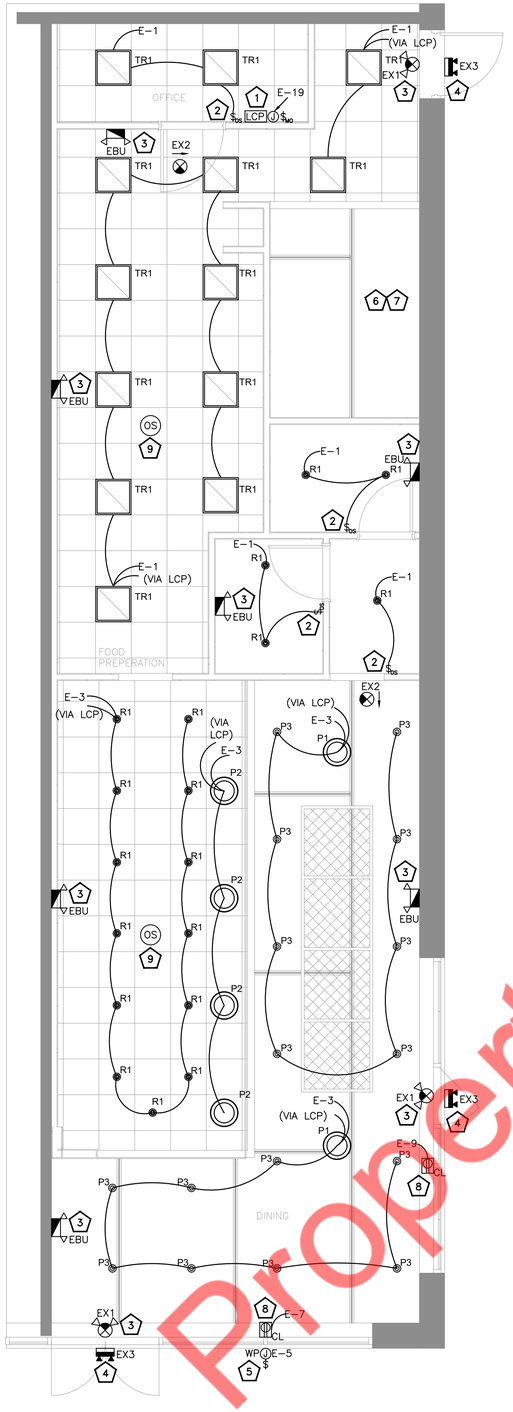
ELECTRICAL SPECIFICATIONS SHEET 2 OF 2

DRAWING NO.

E003



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

LIGHT FIXTURE SCHEDULE					
No.	DESCRIPTION	MANUFACTURER/MODEL	WATTAGE	QUANTITY	NOTES
R1	4" RECESSED DOWN LIGHT	LUMENPULSE LCRS A FD 120 R L13 30K 90 W DA1 SB MBK RD MBK NC 1	11	18	–
P1	DECORATIVE PENDANT	SERENA & LILY HEADLANDS BELL PENDANT – LARGE	08	02	PROVIDE LED LAMP: TCP #FA19D6027EC DIMMABLE A19 FILAMENT, 2700 K, CLEAR, 60 W EQUIV. 800 LUMINS
P2	DECORATIVE PENDANT	MUUTD UNFOLD PENDANT LAMP – US VERSION	08	04	PROVIDE LED LAMP: TCP #FA19D6027EC DIMMABLE A19 FILAMENT, 2700 K, CLEAR, 60 W EQUIV. 400 LUMINS
P3	AMBIENT PENDANT	GOTHAM EVO2PC 35K 10 WR LD MWD MVOLT UGZ SGBCC PCAN S6 DWHG	21.2	16	–
TR1	LED PANEL	LITHONIA LIGHTING EPANL 2X2 4000 LM 80 CRI 35K WN1 ZT MVOLT G1	33	13	–
EX1	EXIT COMBO	EXITRONICS CLED-1-WH-G2	4.5	–	–
EX2	EXIT	EXITRONICS VEX-U-BP-LB-WH	4.5	–	–
EBU	EMERGENCY BATTERY UNIT	EXITRONIX NFT-H0-W-G2	2.7	–	–
EX3	EXTERIOR EMERGENCY	EXITRONIX NFT-H0-W-G2 OR EQUIVALENT	05	–	WEATHER PROOF

- LIGHT FIXTURES SHOULD BE "LED" AT "120 VOLTS".

LIGHTING FIXTURES GENERAL NOTES:

- VERIFY ALL LUMINAIRE COLORS, TRIMS, LENGTHS, ETC. WITH THE ARCHITECT PRIOR TO PLACING FINAL PURCHASE ORDERS. SUBMISSION PF SHOP DRAWINGS WILL BE INTERPRETED AS HAVING BEEN COORDINATED WITH THE ARCHITECTURAL DRAWINGS
- PROVIDE ALL LENGTHS, FEEDS, ACCESSORIES, CONNECTORS, WIRING, POWER SUPPLIES, DRIVERS ETC. FOR A COMPLETE INSTALLATION. THE E.C. SHALL VERIFY THE COMPLETE BILL OF MATERIAL WITH MANUFACTURER'S REPRESENTATIVE AND ENSURE ALL EQUIPMENT ARE INCLUDED IN BID PRICE. COORDINATE INSTALLATION WITH ARCHITECTURAL DETAILS.
- VERIFY FINAL LUMINAIRE LOCATIONS WITH OTHER CEILING MOUNTED EQUIPMENTS SUCH AS DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLANS.
- VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF ALL WALL MOUNTED LUMINAIRE WITH ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO ROUGH-IN.
- ANY PROPOSED ALTERNATE LUMINAIRES SHALL BE APPROVED BY THE ARCHITECT PRIOR TO FINAL BID PRICING.
- SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS, EQUIPMENT AND DEVICES OTHER THAN THOSE SPECIFIED AND LISTED, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS, TO THE ENGINEERS AT LEAST TEN (10) BUSINESS DAYS PRIOR TO BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID AND SHALL INCLUDE A COMPLETE SPECIFICATIONS CUTSHEET SUBMITTAL AS OUTLINED IN THE SPECIFICATIONS, COMPLETE WITH DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. INDICATE ANY ADDITIONS OR DEDUCTIONS TO THE CONTRACT PRICE WITH THE SUBSTITUTION SUBMITTAL AND ON THE BID FORM.
- VERIFY FINAL SELECTION OF LIGHT FIXTURES WITH ARCHITECT.

LIGHTING PLAN KEYED WORK NOTES: (#)

1. PROVIDE RELAY LIGHTING CONTROL PANEL AS MANUFACTURED BY ACUITY CONTROLS "BLUEBOX" #GR1404 LT ENC SM NE1 ENCLOSURE, #GR1404 LT INT 4NCL DTC DV OR APPROVED EQUAL. COORDINATE EXACT LOCATION IN FIELD.
2. WALL MOUNTED OCCUPANCY SENSOR. SET OFF TIME TO 15 MINUTES FOR RESTROOM, SET DIP SWITCH TO AUTOMATIC ON.
3. WIRE ALL EMERGENCY, EXIT AND NIGHT LIGHT AHEAD OF SWITCHING FOR CONTINUOUS OPERATIONS. CONNECT TO ADJACENT LIGHTING CIRCUIT.
4. WEATHERPROOF EMERGENCY LIGHT FIXTURE. E.C SHALL COORDINATE WITH ARCHITECT FOR FINAL FINISH & LOCATION.
5. JUNCTION BOX WITH TOGGLE DISCONNECT PER NEC FOR CONNECTION TO BUILDING MOUNTED SIGNAGE. VERIFY EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURE'S INSTRUCTION. ROUTE CIRCUIT TO PANEL AS INDICATED VIA EXTERIOR LIGHTING/SIGNAGE CONTROLLER.
6. LIGHTING FIXTURES FURNISHED BY WALK-IN BOX VENDOR. ELECTRICAL CONTRACTOR TO INSTALL AND CONNECT FIXTURES TO NEAREST LIGHTING CIRCUIT.
7. PROVIDE OCCUPANCY SENSOR SWITCHES FOR WALK-IN BOX COOLER ENSURE SWITCHES ARE SUITABLE FOR TEMPERATURE OF COOLER/FREEZER.
8. CEILING MOUNTED RECEPTACLE FOR SHOW WINDOW. E.C. TO INSTALL RECEPTACLE WITHIN 18" OF THE TOP OF SHOW WINDOW PER NEC REQUIREMENTS. TO BE CONTROLLED WITH TIME CLOCK.
9. PROVIDE CEILING MOUNTED OCCUPANCY SENSOR AS MANUFACTURED BY SENSOR SWITCH (OR EQUAL) AND COMPATIBLE WITH LIGHTING CONTROL PANEL. SENSOR SHALL BE PROGRAMMED TO BE INACTIVE DURING OCCUPIED HOURS. PROGRAM TIME SCHEDULE AS DIRECTED BY OWNER.

GRAPHIC SCALE: 1/4" = 1'-0"
0 4' 8' 12' 16'

ENGINEER:

CLIENT:
LIV'S JUICE BAR, LLC

PROJECT:
LIVS JUICE - WOBURN

REVISIONS		
NO.	DATE	DESCRIPTION

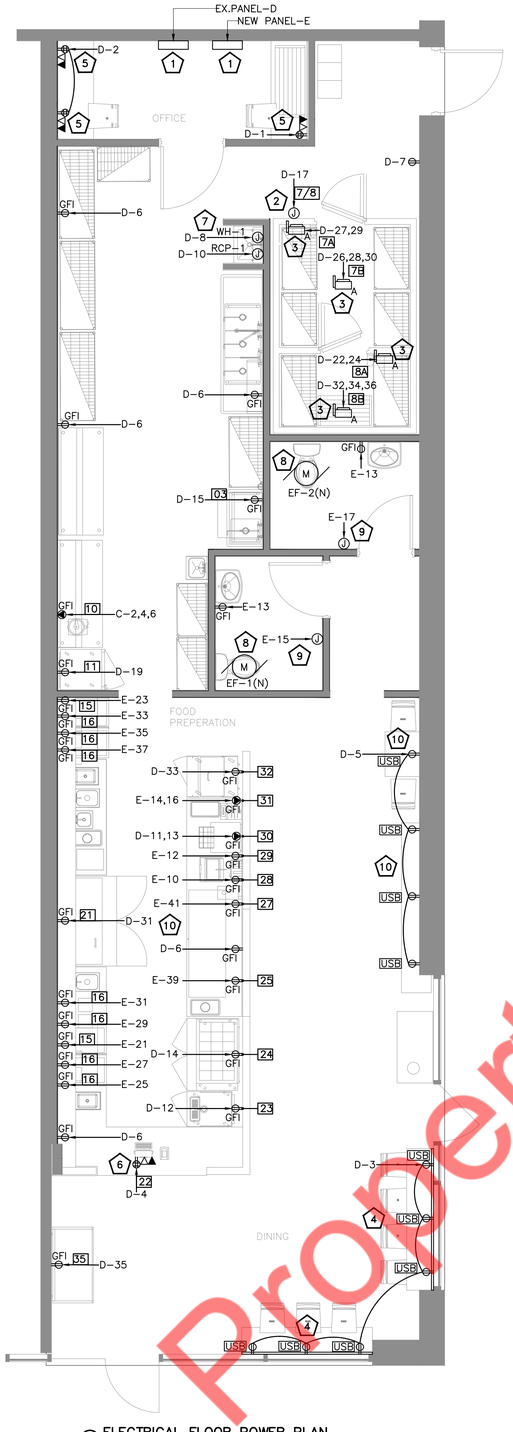
SEAL:

ISSUED FOR: PERMIT
ISSUED DATE: 08.12.22

DRAWN BY: NYE
CHECKED BY: NYE
PROJECT NUMBER: 2209

DRAWING NAME:
ELECTRICAL LIGHTING PLAN

DRAWING NO.
E100



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

ELECTRICAL POWER PLAN GENERAL NOTES:

- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SUPPLYING / INSTALLING ALL ELECTRICAL COMPONENTS NECESSARY TO PROVIDE POWER TO EQUIPMENT. ELECTRICAL CONTRACTOR SHALL ALSO COMPLETE ALL INTERNAL WIRING AND FINAL CONNECTIONS TO EQUIPMENT PER MANUFACTURERS SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO:
  - PROVIDING CAPS AND CORDS TO APPLICABLE EQUIPMENT
  - STAINLESS STEEL COVER PLATES WHERE REQUIRED
  - MAIN BREAKER PANELS, CONTROL PANELS, DISCONNECT SWITCHES, STARTERS, ETC.
- REFER TO ARCHITECTURAL PLANS AND / OR CONSTRUCTION DOCUMENTS FOR ANY ADDITIONAL ELECTRICAL CONNECTIONS OR OUTLETS REQUIRED TO MEET LOCAL CODES.
- ALL 120V, 15A AND 20A RECEPTACLES IN KITCHEN AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B). PROVIDE GFI RATED BREAKER AT PANEL FOR KITCHEN EQUIPMENT.
- E.C. SHALL PROVIDE CONNECTIONS DIRECTLY TO ALL KITCHEN EQUIPMENT ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. ELECTRICAL CONNECTIONS SHALL COMPLY WITH ALL APPLICABLE CODES.
- ALL SAFETY SWITCHES SHALL BE HEAVY DUTY TYPE. PROVIDE WEATHER PROOF SWITCHES WHERE SHOWN DENOTED AS "WP"
- PROVIDE LOCABLE, INDICATING TYPE CIRCUIT BREKERS FOR APPLIANCE BRANCH CIRCUITS PER NEC. REFER TO KITCHEN EQUIPMENT SCHEDULE.
- E.C. SHALL COORDINATE WITH FOOD SERVICE EQUIPMENT VENDOR FOR EXACT LOCATIONS AND MOUNTING HEIGHT OF ALL OUTLETS PRIOR TO ROUGH-IN.

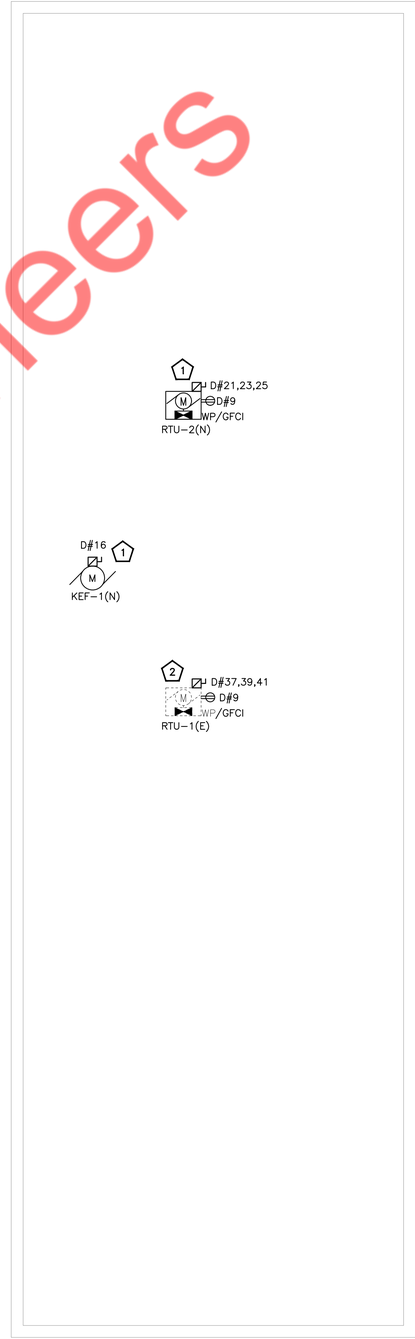
ELECTRICAL POWER PLAN KEYED WORK NOTES: (#)

1. LOCATION FOR EXISTING PANEL "D" AND NEW PANEL "E". THREE FEET CLEAR WORKING SPACE SHALL BE PROVIDED IN FRONT OF THE PANELS AS PER N.E.C..
2. PROVIDE JUNCTION BOX FOR COMBO WALK-IN BOX DOOR HEATER AND MISCELLANEOUS LOADS. E.C. SHALL COORDINATE WITH MANUFACTURER FOR EXACT POWER REQUIREMENTS.
3. E.C. SHALL COORDINATE WITH WALK IN BOX MANUFACTURER FOR EXACT LOCATION AND POWER REQUIREMENT OF THE WALK-IN BOX EQUIPMENTS. PROVIDE BREAKERS AND BRANCH CIRCUITS ACCORDINGLY.
4. PROVIDE DUPLEX RECEPTACLE WITH (2) INTEGRAL USB PORTS. E.C SHALL RUN PLUGMOLD UNDER COUNTER. COORDINATE EXACT LOCATION OF OUTLETS WITH ARCHITECT.
5. PROVIDE 1-QUAD, 1-DATA AND 1-TELEPHONE OUTLET FOR OFFICE. E.C. SHALL COORDINATE WITH ARCHITECT/LV VENDOR EXACT LOCATION AND POWER REQUIREMENT OF POS.
6. PROVIDE 1-QUAD, 1-DATA AND 1-TELEPHONE OUTLET FOR POS. E.C. SHALL COORDINATE WITH ARCHITECT/LV VENDOR EXACT LOCATION AND POWER REQUIREMENT OF POS.
7. E.C. SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF PLUMBING EQUIPMENTS. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
8. EXHAUST FAN IN THE ROOM SHALL BE CIRCUITED AND CONTROLLED ALONG WITH THE LIGHTING FIXTURES IN THE SAME ROOM.
9. PROVIDE JUNCTION BOX FOR HAND DRYER. COORDINATE EXACT LOCATION AND POWER REQUIREMENT IN FIELD.
10. INSTALL RECEPTACLES HORIZONTALLY ABOVE COUNTER. COORDINATE EXACT LOCATION OF THE RECEPTACLES WITH ARCHITECT/EQUIPMENT VENDOR.

EQUIPMENT TAG	REMARKS	QTY	VOLT	PHASE	AMPERAGE
3-ICE MAKER	GENERAL	1	115	1	11.3
7/8-WALK IN BOX COMBO	GENERAL	1	115	1	15
10-BLIXER	GENERAL	1	208	3	16
11-REACH IN REFRIGERATOR	GENERAL	1	115	1	3.8
15-CHEST FREEZER	GENERAL	2	115	1	2
16-BLENDER BAR	GENERAL	7	115	1	13
21-SANWICH/SALAD PREP RERIGERATOR	GENERAL	1	115	1	8.9
23-DRAFT BEER COOLER	GENERAL	1	115	1	1.4
24-SANWICH/SALAD PREP RERIGERATOR	GENERAL	1	115	1	6.5
25-BBC REFRIGERATED	GENERAL	1	115	1	3.96
30-CONVEYOR TOASTER	GENERAL	1	208	1	23.6
32-SANWICH/SALAD PREP RERIGERATOR	GENERAL	1	115	1	3.8
35-OPEN DISPLAY MERCHANDISER	GENERAL	1	115	1	15.5
27-PEANUT GRINDER	GENERAL	1	115	1	10
28-POP UP TOASTER	GENERAL	1	115	1	6.5
29-PANINI	GENERAL	1	115	1	1
31-RANGE	GENERAL	1	208	1	10

ROOF POWER PLAN KEYED NOTES: (#)

1. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENTS OF NEW MECHANICAL EQUIPMENTS. PROVIDE BREAKERS AND BRANCH CIRCUITS AS REQUIRED.
2. E.C. SHALL VERIFY OPERABLE CONDITION OF EXISTING CIRCUIT AND DISCONNECT IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.



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

0

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS		
NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

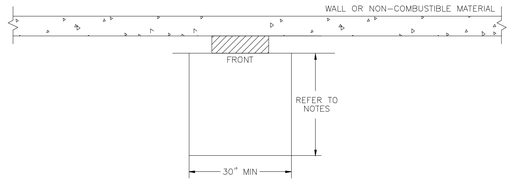
PROJECT NUMBER: 2209

DRAWING NAME:

ELECTRICAL POWER PLAN

DRAWING NO.

E101



RECESSED MOUNTED PANELS

* MINIMUM WORKING CLEARANCE (IN THE DIRECTION OF ACCESS TO LIVE PARTS) AS REQUIRED BY NEC 110-16(a), CONDITION 2 :

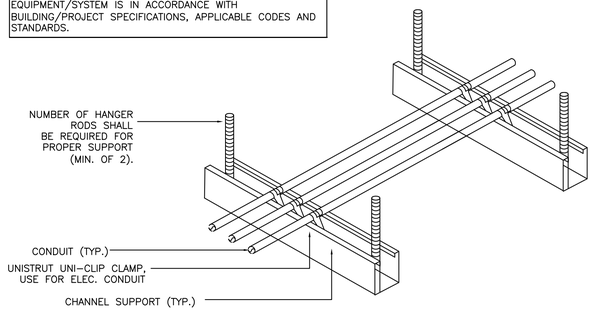
- 3' FOR 0-150 VOLT TO GROUND ELECTRIC EQUIPMENT
- 3-1/2' FOR 150-600 VOLT TO GROUND ELECTRIC EQUIPMENT

THE MINIMUM HEADROOM OF WORKING SPACE SHALL BE 6-1/2'

PANELS INCLUDE: POWER PANELS, CONTACTORS, CONTROL CABINETS, DISCONNECT SWITCHES, CONTROL CABINETS, DISCONNECT SWITCHES, MOTOR STARTERS, TIME CLOCK AND SIMILAR ELECTRIC EQUIPMENT

1 E200 CLEARANCE FOR ELECTRIC EQUIPMENT DETAIL N.T.S

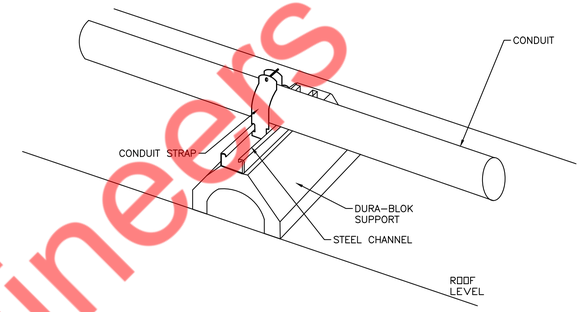
NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT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

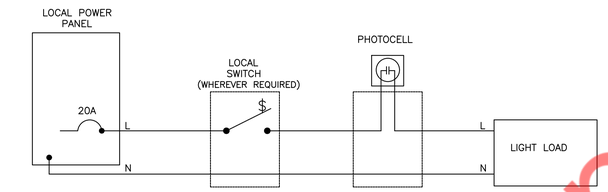
2 E200 CONDUIT SUPPORT DETAIL N.T.S



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".

3 E-200 CONDUIT SUPPORT DETAIL ON ROOF N.T.S



KEYED NOTES:

1. PHOTOCELL SHALL BE MOUNTED ABOVE SNOW LINE (18") ON ROOF OR WALL MOUNTED. EXACT LOCATION SHALL BE FIELD COORDINATED.
2. FOR EXACT CIRCUIT NUMBER, REFER TO LIGHTING PANEL.

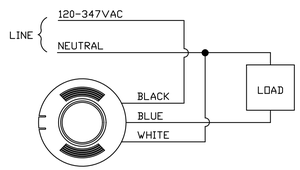
4 E200 PHOTOCELL WIRING DETAILS N.T.S

AUTOMATIC MODE OPERATION:

1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. LOAD TURNS OFF, WITHIN 20 MINUTES OF OCCUPANT LEAVING SPACE.
3. IF DAYLIGHT SENSOR IS ENABLED, AND LIGHT LEVEL IS ABOVE PRESET SETPOINT, LOAD WILL NOT TURN ON.

SENSOR TYPES INCLUDE:

OAC-DT-2000-MV,
OAC-U-2000-MV,
OAC-P-0500-MV, OAC-P-1500-MV



5 E200 OCCUPANCY-SINGLE RELAY WIRING DIAGRAM-LINE 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.

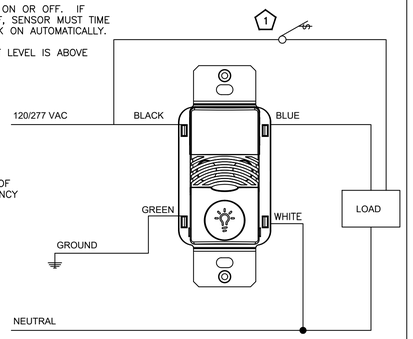
AUTOMATIC MODE OPERATION:

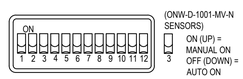
1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. PUSHBUTTON CAN BE USED TO TURN LOAD ON OR OFF. IF PUSHBUTTON IS USED TO TURN LOAD OFF, SENSOR MUST TIME OUT FIRST, BEFORE LOAD CAN TURN BACK ON AUTOMATICALLY.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

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

6 E200 WIRING DIAGRAM-LINE VOLTAGE WALL SWITCH SENSOR(NEUTRAL CONNECTION) OCCUPANCY/VACANCY-SINGLE LEVEL N.T.S

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS

NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT
ISSUED DATE: 08.12.22

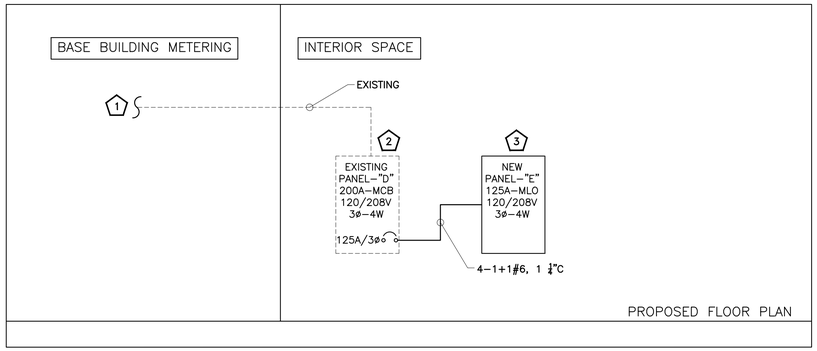
DRAWN BY: NYE
CHECKED BY: NYE
PROJECT NUMBER: 2209

DRAWING NAME:

ELECTRICAL DETAILS

DRAWING NO.

E200



PROPOSED FLOOR PLAN

RISER DIAGRAM GENERAL NOTES:

- ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AHJ AND CALCULATE ACTUAL AIC RATING REQUIRED PRIOR TO BID.
- E.C. TO VERIFY EXACT POWER DISTRIBUTION IN FIELD. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY. PRIOR TO BID.
- E.C. TO VERIFY AND OPERABLE CONDITIONS OF ALL EXISTING PANELS. FEEDER DISCONNECT, SWITCH ETC. IN FIELD. REPLACE IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.
- E.C. SHALL FIELD VERIFY IF THE DEDICATED METER EXISTS FOR THE SPACE. INFORM ENGINEER ON RECORD IN CASE OF ANY DISCREPANCY. PRIOR TO BID.

ELECTRICAL RISER SYMBOL

- NEW
- EXISTING ITEM/FEEDER TO REMAIN
- EXISTING ITEM/FEEDER TO BE DOSCONNECTED & REMOVED

RISER DIAGRAM KEYED WORK NOTES: (#)

1. EXISTING 200A 120/208VOLTS, 3 PHASE, FEEDER FROM EXISTING METER/BASE BUILDING SWITCHGEAR. E.C. SHALL VERIFY ITS RATING AND OPERABLE CONDITIONS IN FIELD. INFORM ENGINEER ON RECORD IN CASE OF ANY DISCREPANCY.
2. EXISTING 200AMPS, 120/208VOLTS, 3 PHASE ELECTRICAL PANEL "D" TO REMAIN. E.C. SHALL VERIFY ITS LOCATION, RATING AND OPERABLE CONDITION IN FIELD. REPLACE IF INOPRABLE. BASE BID ACCORDINGLY.
3. NEW 125A, 120/208V, 3 PHASE, ELECTRICAL PANEL "E". E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL.

PANEL SCHEDULE GENERAL NOTES:

- ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD AND INFORM ENGINEER IF ANY DISCREPANCIES. PRIOR TO BID.
- E.C.SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE. PRIOR TO BID.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBER & BREAKER SIZE OF EXISTING DEVICES IN FIELD.

PANEL SCHEDULE ABBREVIATIONS:

L=LIGHTING
R=RECEPTACLE
H=HVAC
M=MOTOR
E=EQUIPMENTS
O=OTHER

PANEL:	D	(EXISTING)									MOUNTING:	SURFACE
120/208	VOLTS		3	PHASE	4	WIRE					PANEL LOCATION:	OFFICE ROOM
MCB	200A		BUS:	250A	MINIMUM						FED FROM:	EXISTING SERVICE
NOTE:												

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	QUAD AT OFFICE	R	0.36	2#12, 1#12, 3/4"C	1.08			2#12, 1#12, 3/4"C	0.72	R	QUAD AT OFFICE	20	2
3	20	DINING-GENERAL RECEPTACLE	R	1.08	2#12, 1#12, 3/4"C		1.44		2#12, 1#12, 3/4"C	0.36	R	22-POS	20	4
5	20	DINING-GENERAL RECEPTACLE	R	0.54	2#12, 1#12, 3/4"C			1.44	2#12, 1#12, 3/4"C	0.90	R	KITCHEN-GENERAL RECEPTACLE	20	6
7	20	BOH GENERAL RECEPTACLE	R	0.36	2#12, 1#12, 3/4"C	0.86			2#12, 1#12, 3/4"C	0.50	O	WATER HEATER (WH-1)	20	8
9	20	WP/GFCI SERVICE RECEPTACLE	R	0.18	2#12, 1#12, 3/4"C		0.28		2#12, 1#12, 3/4"C	0.10	M	RECIRCULATION PUMP (RCP-1)	20	10
11	30/2P	30-CONVEYOR TOASTER	E	2.45	2#10, 1#10, 3/4"C			2.65	2#12, 1#12, 3/4"C	0.20	E	23-DRAFT BEER COOLER	20	12
13			E	2.45		3.20			2#12, 1#12, 3/4"C	0.75	E	24-SANWICH/SALAD PREP	20	14
15	20	3-ICE MAKER	E	1.30	2#12, 1#12, 3/4"C		1.80		2#12, 1#12, 3/4"C	0.50	H	KEF-1 (N)	20	16
17	20	7/8-COMBO WALK-IN	E	1.72	2#12, 1#12, 3/4"C			1.72				SPARE	20	18
19	20	11-REACH IN REFRIGERATOR	E	0.50	2#12, 1#12, 3/4"C	0.50						SPARE	20	20
21	50/3P	RTU-2 (N)	H	2.80	3#8, 1#10, 3/4"C		3.80		2#12, 1#12, 3/4"C	1.00	O	8A-WIF EVAPORATOR COIL	20/2P	22
23			H	2.80				3.80		1.00	O			24
25			H	2.80		4.60				1.80	O			26
27	20/2P	7A-WIC EVAPORATOR COIL	O	1.00	2#12, 1#12, 3/4"C		2.80		3#10, 1#10, 3/4"C	1.80	O	7B-WIC CONDENSING UNIT	30/3P	28
29			O	1.00				2.80		1.80	O			30
31	20	21-SANWICH/SALAD PREP	E	1.00	2#12, 1#12, 3/4"C	2.80				1.80	O			32
33	20	32-SANWICH/SALAD PREP	E	0.50	2#12, 1#12, 3/4"C		2.30		3#10, 1#10, 3/4"C	1.80	O	8B-WIF CONDENSING UNIT	30/3P	34
35	20	35- DISPLAY MERCHANDISER	E	1.80	2#12, 1#12, 3/4"C			3.60		1.80	O			36
37	50/3P	RTU-1 (E)	H	2.80	3#8, 1#10, 3/4"C	9.96			4#1, 1#6, 1 1/4"C	7.16	O	TO PANEL E	125/3P	38
39			H	2.80			9.96			7.16	O			40
41			H	2.80				9.96		7.16	O			42
						23.00	**22.38**	**25.97**						

PANEL:	E	(NEW)									MOUNTING:	SURFACE
120/208	VOLTS		3	PHASE	4	WIRE					PANEL LOCATION:	OFFICE ROOM
MLO	125A		BUS:	125A	MINIMUM						FED FROM:	PANEL D
NOTE:												

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	LIGHTING - BACK OF HOUSE	L	0.50	2#12, 1#12, 3/4"C	2.45			3#12, 1#12, 3/4"C	1.95	E	10-BLIXER	20/3P	2
3	20	LIGHTING - FRONT OF HOUSE	L	0.50	2#12, 1#12, 3/4"C		2.45			1.95	E			4
5	20	BUILDING SIGNAGE	L	0.50	2#12, 1#12, 3/4"C			2.45		1.95	E			6
7	20	SHOW WINDOW	R	1.80	2#12, 1#12, 3/4"C	1.80						SPARE		8
9	20	SHOW WINDOW	R	1.80	2#12, 1#12, 3/4"C		2.30		2#12, 1#12, 3/4"C	0.50	E	28-POP UP TOASTER	20	10
11	20	SPARE						0.50	2#12, 1#12, 3/4"C	0.50	E	29-PANINI	20	12
13	20	RESTROOM RECEPTACLE	R	0.36	2#12, 1#12, 3/4"C	1.36			2#12, 1#12, 3/4"C	1.00	E	31-RANGE	20/2P	14
15	20	RESTROOM HAND DRYER	R	1.00	2#12, 1#12, 3/4"C		2.00			1.00	E			16
17	20	RESTROOM HAND DRYER	R	1.00	2#12, 1#12, 3/4"C			1.00				SPARE	20	18
19	20	LIGHTING CONTROL PANEL	R	0.10	2#12, 1#12, 3/4"C	0.10						SPARE	20	20
21	20	15-CHEST FREEZER	E	0.25	2#12, 1#12, 3/4"C		0.25					SPARE	20	22
23	20	15-CHEST FREEZER	E	0.25	2#12, 1#12, 3/4"C			0.25				SPARE	20	24
25	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C	1.50						SPARE	20	26
27	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C		1.50					SPARE	20	28
29	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C			1.50				SPARE	20	30
31	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C	1.50						SPARE	20	32
33	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C		1.50					SPARE	20	34
35	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C			1.50				SPARE	20	36
37	20	16-BLENDER BAR	E	1.50	2#12, 1#12, 3/4"C	1.50						SPARE	20	38
39	20	25-BBC REFRIGERATED	E	0.50	2#12, 1#12, 3/4"C		0.50					SPARE	20	40
41	20	27-PEANUT GRINDER	E	0.50	2#12, 1#12, 3/4"C			0.50				SPARE	20	42
						10.21	**10.50**	**7.70**						

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

LIVS JUICE - WOBURN

PROJECT:

REVISIONS

NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

PROJECT NUMBER: 2209

DRAWING NAME:

ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

DRAWING NO.

E300

GENERAL NOTES

1. ALL PLUMBING WORK SHALL BE DONE IN ACCORDANCE WITH THE 248 CMR UNIFORM STATE PLUMBING AND FUEL GAS CODE THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE PLUMBING INSPECTOR FOR ALL PLUMBING INSPECTIONS
2. CAREFULLY COORDINATE LOCATION OF PIPING WITH ALL OTHER TRADES AND ALL EXISTING CONDITIONS
3. ALL PIPING SHOWN DIAGRAMMATICALLY AND ALL EXACT LOCATIONS SHALL BE DETERMINED IN THE FIELD
4. ALL PIPING SHALL BE RUN CONCEALED ABOVE CEILINGS, IN WALLS AND IN CHASES WHEREVER POSSIBLE
5. NO STRUCTURAL MEMBERS SHALL BE CUT
6. ALL PIPING SHALL BE SUPPORTED FROM BUILDING STRUCTURE
7. RUN WATER PIPE ON THE WARM SIDE OF BUILDING INSULATION NO WATER PIPING SHALL BE RUN IN EXTERIOR WALLS
8. PROVIDE DRAW OFFS WITH BALL VALVE, HOSE END VACUUM BREAKER, CAP & CHAIN AT ALL DOMESTIC WATER LOW POINTS AND PITCH PIPING TO DRAIN
9. ALL SANITARY WASTE PIPING SHALL PITCH A MIN OF 1/8" PER FT FOR PIPING 4" & LARGER, 1/4" FOR PIPING UP TO 3" ALL VERTICAL SANITARY LINES & DRAIN LINES ASSOCIATED WITH ICE MAKERS, SODA DISPENSERS ETC TO BE INSULATED, INSULATION AS SPECIFIED
10. PROVIDE ACCESSIBLE CLEANOUTS AT THE BASE OF ALL STACKS, AS SHOWN, AND AS REQUIRED
11. ALL PIPING SHALL BE NEW, INSTALLED PARALLEL TO BUILDING LINES AND PITCHED TO LOW POINTS
12. PLUMBING CONTRACTOR SHALL PROVIDE FIRE STOPPING FOR ALL PENETRATIONS THROUGH ALL FLOORS, FIRE WALLS AND FIRE RATED SEPARATIONS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR THESE AREAS AND PROVIDE LINK SEAL FIRE STOPPING KITS
13. PLUMBING CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN ALL SCAFFOLDING, HOISTING EQUIPMENT, DERRICKS, ETC. , NECESSARY FOR INSTALLATION OF WORK
14. ALL PLUMBING PIPING AND DRAINS SHALL BE KEPT CLEAR OF BLOCKAGE WHILE CONSTRUCTION IS UNDERWAY ALL PLUMBING PIPING SHALL BE DEBURRED BEFORE JOINTS ARE MADE.
15. ALL EXISTING CONDITIONS SHOWN ARE APPROXIMATE ONLY ALL EXISTING CONDITIONS SHALL BE VERIFIED IN THE FIELD. ALL NEW SYSTEMS SHALL BE COORDINATED WITH ALL EXISTING CONDITIONS AND TRADES EXACT LOCATIONS OF ALL CONNECTIONS TO EXISTING SYSTEMS AND EQUIPMENT SHALL BE DETERMINED IN FIELD.
16. PRIOR TO BID, THE CONTRACTOR SHALL VISIT THE SITE AND FAMILIARIZE HIMSELF WITH ALL TRADE DRAWINGS AND ALL ASPECTS OF THE WORK AND ALL CONDITIONS TO WHICH THE WORK WILL BE INSTALLED. ANY DISCREPANCIES BETWEEN THE WORK SHOWN ON THE DRAWINGS AND ANY CONDITIONS SHALL BE SUBMITTED TO THE ARCHITECT IN WRITING FAILURE OF THE CONTRACTOR TO DO SO SHALL NOT CONSTITUTE AN EXTRA COST TO THE CONTRACT.
17. DIELECTRIC INSULATING FITTINGS SHALL BE USED WHERE PIPES OF DISSIMILAR METALS ARE CONNECTED, AND AT THE WATER HEATER
18. THE INFORMATION SHOWN ON THE DRAWINGS IS GENERALLY DIAGRAMMATIC AND IS NOT INTENDED TO INDICATE EXACT ROUTES OF PIPING OR LOCATIONS OF VALVES, DRAINS, EQUIPMENT, FIXTURES OR FINAL CONNECTIONS IT SHALL BE THE RESPONSIBILITY OF THE PLUMBING CONTRACTOR TO DETERMINE THE BEST ROUTES OF PIPING AND LOCATIONS OF PIPING CONNECTIONS IN THE FIELD AND IN CONJUNCTION WITH COORDINATION BETWEEN ALL OTHER TRADES AT THE SIGHT.
19. ALL NEW SYSTEMS SHALL BE TESTED, BALANCED AND ADJUSTED TO ENSURE PROPER OPERATION AND CODE COMPLIANT INSTALLATION PIPING AND EQUIPMENT SHALL BE TESTED IN ACCORDANCE WITH THE STATE PLUMBING CODE
20. THE CONTRACTOR SHALL BE CAREFUL TO ENSURE THAT NO CROSS CONNECTIONS ARE MADE BETWEEN THE POTABLE WATER SUPPLY AND ALL SOURCES OF CONTAMINATION OR CROSS CONNECTION
21. ALL PIPING MATERIALS, FITTINGS VALVES UNIONS, HANGERS, EQUIPMENT, INSTALLATION AND ALL ASPECTS OF THE PLUMBING WORK 21 SHALL BE AS APPROVED BY THE 248 CMR UNIFORM STATE PLUMBING CODE
22. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF WALLS AND FLOORS TO ACCOMMODATE INSTALLATION OF NEW PIPING AND EQUIPMENT CONTRACTOR SHALL PATCH ALL SURFACES TO MATCH THE EXISTING CONDITIONS AND TO THE SATISFACTION OF THE ARCHITECT
23. PROVIDE SERVICE STOPS FOR ALL FIXTURES
24. THE TERM "CONTRACTOR" SHALL MEAN PLUMBING CONTRACTOR
25. PLUMBER SHALL FURNISH AND INSTALL ALL TRAPS, ANGLE STOPS, WASTE ARMS, STRAINERS, TAILPIECES, FIXTURE SUPPLIES AND ALL PLUMBING 25 CONNECTIONS TO ALL PLUMBING FIXTURES REQUIRING PLUMBING AND AS REQUIRED FOR A COMPLETE PLUMBING SYSTEM.
26. ALL PLUMBING FIXTURE TYPES AND LOCATIONS ARE APPROXIMATE ONLY THE CONTRACTOR SHALL HAVE THE APPROVAL OF THE ARCHITECT FOR ALL PLUMBING FIXTURE TYPES, QUANTITIES AND LOCATIONS PRIOR TO PURCHASE.
27. THE PLUMBING CONTRACTOR SHALL CREATE A SCALE DRAWING FOR THE BUILDING SHOWING THE LOCATIONS OF ALL BACK FLOW PREVENTION DEVICES AND DETAILS OF THEIR INSTALLATION METHODS THE PLUMBING CONTRACTOR SHALL ALSO OBTAIN MANUFACTURER CUT SHEETS OF ALL BACK FLOW PREVENTION DEVICES AND SHALL INDICATE THE SIZES AND MODEL NUMBERS BEING USED. THE PLUMBING CONTRACTOR SHALL SUBMIT THESE DRAWINGS AND CUT SHEETS TO THE LOCAL WATER AUTHORITY FOR APPROVAL. NO BACK FLOW PREVENTION DEVICE SHALL BE INSTALLED UNTIL WRITTEN APPROVAL OF ALL BACK FLOW PREVENTION DEVICES HAS BEEN OBTAINED BY THE PLUMBING CONTRACTOR FROM THE LOCAL WATER AUTHORITY.
28. IN THE EVENT THAT THERE ARE DISCREPANCIES BETWEEN PIPE SIZES SHOWN ON THE PLANS VERSUS THAT SHOWN ON THE DETAILS OR RISER DIAGRAMS, THE LARGER PIPE SIZE SHALL BE FOLLOWED.
29. THE PLUMBING CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE INSTALLATION OF ALL KITCHEN SINKS, FAUCETS 29 AND ALL EQUIPMENT REQUIRING PLUMBING CONNECTIONS.

ENERGY CONSERVATION NOTES

1. AS PER 2020 MASSACHUSETTS ENERGY CODE SECTION C404.4, PIPING FROM A WATER HEATER TO THE TERMINATION OF HEATED WATER FIXTURE SUPPLY PIPE SHALL BE INSULATED IN ACCORDANCE WITH TABLE C403.11.3 OF MINIMUM PIPE INSULATION THICKNESS.

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 < 1½	1½ to < 4	4 to < 8	<8
141–200	0.25–0.29	125	1.5	1.5	2	2	2
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	1.0	1.0	1.0

2. AS PER 2020 MASSACHUSETTS ENERGY CODE, C404.6.1, 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 NOT DEMAND FOR HOT WATER.
3. AS PER 2020 MASSACHUSETTS ENERGY CODE, C404.6.3. PUMPS THAT CIRCULATE WATER BETWEEN A HEATER AND STORAGE TANK HAVE CONTROLS THAT LIMIT OPERATION FROM STARTUP TO <= 5 MINUTES AFTER END OF HEATING CYCLE.
4. AS PER 2020 MASSACHUSETTS ENERGY CODE, C404.7, THE CONTROLS SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO NOT GREATER THAN 104°F (40°C).
5. AS PER 2020 MASSACHUSETTS ENERGY CODE 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 C404.5.1.

MAXIMUM PIPING LENGTH		
NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
½"	2'	43'
¾"	0.5'	21'
1"	0.5'	13'
1¼"	0.5'	8'
1½"	0.5'	6'
2" OR LARGER	0.5'	4'

SPECIFICATIONS

1. CAREFULLY COORDINATE LOCATION OF PIPING WITH ALL OTHER TRADES AND ALL CONDITIONS AT THE SITE
2. DIELECTRIC INSULATING FITTINGS SHALL BE USED WHERE PIPES OF DISSIMILAR METALS ARE CONNECTED, AND AT THE WATER HEATERS
3. PROVIDE ACCESSIBLE CLEANOUTS AT THE BASE OF ALL STACKS, AS SHOWN, AND AS REQUIRED
4. ALL PIPING SHALL BE NEW, INSTALLED PARALLEL TO BUILDING LINES AND PITCHED TO LOW POINTS
5. CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL CONDITIONS AND COORDINATE BEST ROUTE OF NEW PIPING AND LOCATIONS OF NEW EQUIPMENT IN COORDINATION WITH THE WORK OF ALL OTHER TRADES AND ALL CONDITIONS TO ENSURE THAT ALL WORK WILL FIT IN THE SPACE WITH NO INTERFERENCE'S
6. ALL NEW SYSTEMS SHALL BE TESTED, BALANCED AND ADJUSTED TO ENSURE PROPER OPERATION AND CODE COMPLIANT INSTALLATION PIPING AND EQUIPMENT SHALL BE TESTED IN ACCORDANCE WITH THE STATE PLUMBING CODE
7. BAND HANGERS SHALL BE USED TO SUPPORT PIPING, PIPE SHIELDS SHALL BE INSTALLED TO PROTECT AGAINST DAMAGE TO THE PIPE INSULATION 3/8" RODS SHALL BE USED
8. ALL COLD WATER, HOT WATER, HOT WATER RETURN PIPING SHALL BE INSULATED WITH 1" FIBERGLASS INSULATION WITH FACTORY APPLIED JACKET ALL FITTINGS AND VALVES SHALL BE PROVIDED WITH INSULATION AND WHITE PREMOLDED PVC INSULATION COVERS ALL WATER PIPING MAINS AND BRANCH RUNOUTS THAT ARE EXPOSED SHALL BE COVERED WITH WHITE PVC PIPE COVERS THIS SHALL INCLUDE ALL FITTINGS AND VALVES ALL FITTINGS AND VALVES SHALL BE PROVIDED WITH INSULATION AND WHITE PREMOLDED PVC INSULATION COVERS
9. THE PLUMBING CONTRACTOR SHALL OBTAIN PERMITS FOR ALL HOT WORK PRIOR TO ANY HOT WORK AT THE SITE
10. ABOVE GROUND WATER PIPING SHALL BE TYPE "L" COPPER TUBING THAT IS INCISED MARKED AND HAS CAST BRASS OR WROUGHT COPPER FITTINGS. DRAIN AND VENT PIPING 2" AND SMALLER SHALL BE TYPE "L" COPPER COPPER TUBING HAVING CAST BRASS OR WROUGHT COPPER DRAINAGE PATTERN FITTINGS. BELOW GROUND WATER PIPING SHALL BE TYPE "K" COPPER TUBING THAT IS INCISED MARKED AND HAS CAST BRASS OR WROUGHT COPPER FITTINGS OR OTHER AS PER 248 CMR MASSACHUSETTS PLUMBING CODE APPROVED FITTINGS
11. BALL VALVES SHALL BE FULL PORT WITH STAINLESS STEEL BALL AND STEM WITH SOLDER OR THREADED FITTINGS AS APPLICABLE
12. DRAIN AND VENT PIPING ABOVE GROUND LARGER THAN 2" SHALL BE SERVICE WEIGHT CAST IRON SOIL PIPE AND FITTINGS PROVIDED THAT TARRED OR PLAIN JOINTS ARE MADE WITH PACKED OAKUM AND MOLTEN LEAD OR RESILIENT GASKETS.
13. THE CONTRACTOR SHALL BE CAREFUL TO ENSURE THAT NO CROSS CONNECTIONS ARE MADE BETWEEN THE POTABLE WATER SUPPLY AND ALL SOURCES OF CONTAMINATION OR CROSS CONNECTION
14. ALL PIPING MATERIALS, FITTINGS VALVES UNIONS, HANGERS, EQUIPMENT, INSTALLATION AND ALL ASPECTS OF THE PLUMBING WORK SHALL BE AS APPROVED BY THE MASSACHUSETTS PLUMBING AND FUEL GAS CODES
15. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF WALLS AND FLOORS TO ACCOMMODATE INSTALLATION OF NEW PIPING AND EQUIPMENT CONTRACTOR SHALL PATCH ALL SURFACES TO MATCH THE EXISTING CONDITIONS AND TO THE SATISFACTION OF THE ARCHITECT
16. ALL VALVES INDICATED SHALL BE BY CONBRACO
17. INSTALL SHOCK ABSORBERS BY PRECISION PLUMBING PRODUCTS AT ENDS OF HOT AND COLD WATER PIPING RUNS BELOW THE LAST FIXTURE
18. ALL CLEANOUTS SHALL BE BY ZURN WITH BRONZE PLUGS. ALL CLEANOUTS SHALL BE TURNED UP INTO THE TENANT SPACE
19. ALL EXPOSED PIPING, VALVES AND FITTINGS AT THE FIXTURES SHALL BE CHROME FINISH
20. ALL VALVES SHALL BE PROVIDED WITH TAGS, ALL PIPING SHALL BE LABELED WITH ADHESIVE DECALS PER ASME AND STATE PLUMBING CODE. STANDARDS
21. PROVIDE SERVICE STOPS FOR ALL FIXTURES
22. PROVIDE ACCESS PANELS BY MILACRON ACCESS PANELS SHALL BE 18" X 18" AND SHALL BE WITH A PRIMED FINISH FOR PAINTING BY OTHERS ACCESS PANELS SHALL BE GIVEN TO THE G C FOR INSTALLATION ALL ACCESS PANELS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO PURCHASE
23. SUBMIT SHOP DRAWINGS FOR ALL FIXTURES, TRIM, FAUCETS, VALVES, PIPING, INSULATION, WATER HEATERS FLOOR DRAINS, CLEANOUTS, PUMPS, ETC ALL SHOP DRAWINGS SHALL HAVE THE APPROVAL OF THE ENGINEER PRIOR TO PURCHASE AND INSTALLATION OF ANY PLUMBING SYSTEMS
24. PROVIDE "P" TRAPS FOR ALL PLUMBING FIXTURE DRAINS
25. ALL SHOCK ABSORBERS AND TRAP PRIMERS SHALL BE BY PRECISION PLUMBING PRODUCTS
26. THE DRAWINGS ARE DIAGRAMMATICAL ONLY THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT ROUTE OF ALL PIPING, IN THE FIELD AND IN CONJUNCTION WITH COORDINATION OF ALL EXISTING CONDITIONS, NEW CONSTRUCTION, AND COORDINATION WITH ALL OTHER TRADES TO ENSURE THE ALL OF THE PLUMBING SYSTEMS WILL FIT INTO THE SPACE WITH NO INTERFERENCES BETWEEN ANY EXISTING OR NEW CONDITIONS AND ANY OTHER TRADES
27. THE PLUMBING CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE INSTALLATION OF ALL KITCHEN SINKS, FAUCETS AND ALL EQUIPMENT REQUIRING PLUMBING CONNECTIONS
28. ALL WATER PIPING SHALL BE TESTED FOR COLIFORM BY A LICENSED TESTING LAB A CERTIFIED REPORT FROM THE LAB SHALL BE SUBMITTED TO THE STATE PLUMBING INSPECTOR FOR REVIEW AND APPROVAL THIS SHALL BE DONE AND APPROVAL SHALL BE OBTAINED FROM THE INSPECTOR PRIOR TO FINAL ACCEPTANCE OF THE PLUMBING WORK
29. THE PLUMBING CONTRACTOR SHALL SUBMIT MANUFACTURERS SHOP DRAWINGS FOR ALL PROPOSED PLUMBING FIXTURES, MATERIALS, VALVES AND EQUIPMENT SHALL BE SUBMITTED TO THE PLUMBING ENGINEER FOR APPROVAL WRITTEN APPROVAL OF ALL PROPOSED PLUMBING FIXTURES, MATERIALS, VALVES AND EQUIPMENT SHALL BE RECEIVED FROM THE PLUMBING ENGINEER PRIOR TO THE COMMENCEMENT OF ANY PLUMBING WORK
30. ALL SANITARY PIPING INSTALLED BELOW THE FLOOR THAT IS ASSOCIATED WITH THE DRAINS FROM ALL ICE MAKERS, ICE MACHINES, ICE BINS AND SODA DISPENSERS SHALL BE PROVIDED WITH INSULATION THAT SHALL INCLUDE THE P-TRAP, FLOOR DRAIN BODY AND TAILPIECE AND 10 LINEAR FEET OF DRAIN PIPE INCLUDING ALL FITTINGS INSULATION SHALL BE 1" THICK FIBERGLASS WITH MANUFACTURERS APPLIED VAPOR BARRIER JACKET
31. ALL PIPE PENETRATIONS THROUGH THE FLOOR SLAB SHALL BE MADE WITH METAL PIPE SLEEVES THAT SHALL EXTEND A MINIMUM OF 2" ABOVE THE FINISH FLOOR THE SPACE BETWEEN THE PENETRATION AND THE SLEEVE SHALL BE PROVIDED WITH UL-APPROVED FIRE STOPPING FOR MEMBRANE FLOORS, FLASHING SHALL BE PROVIDED AND SHALL EXTEND A MINIMUM OF 6" ABOVE THE FLOOR LEVEL COORDINATE WITH ARCHITECT FOR FLOOR TYPES ALL FLOOR DRAINS, FLOOR SINKS AND PIPE SLEEVES SHALL BE GROUTED SOLID
32. ALL BUILDING SHUT-DOWNS ARE TO BE COORDINATED WITH THE OWNER/LANDLORD
33. WATER HAMMER ARRESTORS / SHOCK ABSORBERS TO PROVIDED AT ALL EQUIPMENT WITH QUICK ACTING VALVES AND AT THE TOILET ROOMS WITH FLUSH VALVES

KITCHEN NOTES

1. ALL PIPING CONNECTIONS SHOWN ARE APPROXIMATE ONLY THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE KITCHEN CONTRACTOR FOR THE EXACT LOCATIONS AND REQUIREMENTS OF ALL PIPING DROPS AND FINAL CONNECTIONS, AS WELL AS ALL VALVES THIS SHALL BE DONE PRIOR TO ANY INSTALLATION OF ANY PLUMBING SYSTEMS ASSOCIATED WITH THE KITCHEN
2. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FINAL PLUMBING CONNECTIONS TO ALL KITCHEN EQUIPMENT REQUIRING PLUMBING ALL FINAL CONNECTIONS SHALL BE COORDINATED WITH THE KITCHEN CONTRACTOR PRIOR TO INSTALLATION ALL FINAL PLUMBING CONNECTIONS TO ALL KITCHEN EQUIPMENT SHALL BE IN ACCORDANCE WITH THAT EQUIPMENTS MANUFACTURERS RECOMMENDATIONS
3. THE TERM "KITCHEN EQUIPMENT" SHALL INCLUDE ALL FIXTURES, FAUCETS, SINKS, COOKING EQUIPMENT, ICE MAKERS AND ANY EQUIPMENT OR FIXTURE OR FAUCET IN THE KITCHEN THAT REQUIRES PLUMBING CONNECTIONS
4. ALL FINAL WATER CONNECTIONS SHALL BE PROVIDED WITH SHUT OFF VALVES OR SERVICE STOPS
5. THE PLUMBING CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL KITCHEN EQUIPMENT DRAWINGS AND CUTSHEET INFORMATION AND TO PERFORM ALL COORDINATION WITH THE KITCHEN CONTRACTOR AND KITCHEN EQUIPMENT VENDORS SO AS TO FAMILIARIZE HIMSELF WITH EVERY PIECE OF KITCHEN EQUIPMENT REQUIRING PLUMBING CONNECTIONS ALL FINAL CONNECTIONS POINTS, VALVE REQUIREMENTS AND DIMENSIONS SHALL DETERMINED AS A RESULT OF THIS COORDINATION THE PLUMBING DRAWINGS SHALL NOT BE USED FOR DIMENSIONING OF ANY DRAINS, VENTS OR WATER PIPING
6. THE PLUMBING CONTRACTOR SHALL RUN ALL INDIRECT WASTE PIPING FROM KITCHEN EQUIPMENT TO INDIRECT WASTE AT FLOOR DRAINS AND FLOOR SINKS THE PLUMBING CONTRACTOR SHALL COORDINATE WITH THE KITCHEN CONTRACTOR FOR ALL REQUIRED INDIRECT WASTE DRAINS INDIRECT WASTE PIPING FROM KITCHEN EQUIPMENT SHALL BE COPPER AS APPROVED BY THE 248 CMR UNIFORM STATE PLUMBING CODE
7. ALL FLOOR DRAIN AND FLOOR SINK LOCATIONS SHOWN ARE APPROXIMATE ONLY AND SHALL NOT BE USED BY THE PLUMBING CONTRACTOR FOR THE ACTUAL FLOOR DRAIN AND FLOOR SINK INSTALLATIONS THE PLUMBING CONTRACTOR SHALL COORDINATE ALL FLOOR DRAIN AND FLOOR SINK LOCATIONS WITH THE KITCHEN EQUIPMENT CONTRACTOR FOR THE EXACT LOCATIONS AND TYPES OF ALL FLOOR DRAINS AND FLOOR SINKS
8. ALL KITCHEN EQUIPMENT, FIXTURES AND FAUCETS SHALL BE FURNISHED BY OTHERS ALL EQUIPMENT AND FIXTURES SHALL BE INSTALLED BY OTHERS ALL FAUCETS FOR FIXTURES AND EQUIPMENT SHALL BE INSTALLED BY THE PLUMBING CONTRACTOR ALL FAUCET AND FIXTURE TRIM, DRAINS, WASTES, SERVICE STOPS, P-TRAPS, WASTE ARMS, WATER SUPPLIES, SINK STRAINERS, TAILPIECES AND ALL PLUMBING TRIM ASSOCIATED WITH KITCHEN FIXTURES, FAUCETS AND EQUIPMENT INCLUDING ALL FINAL CONNECTIONS SHALL BE FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR
9. THE PLUMBING CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE INSTALLATION OF ALL KITCHEN SINKS, FAUCETS AND ALL EQUIPMENT REQUIRING PLUMBING CONNECTIONS
10. THE PLUMBING CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR COORDINATING WITH THE KITCHEN EQUIPMENT REQUIRING WATER CONNECTIONS TO INSURE THAT ALL REQUIRED BACKFLOW PROTECTION DEVICES ARE FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR IN ACCORDANCE WITH THE 248 CMR UNIFORM STATE PLUMBING CODE.

PLUMBING FIXTURE NOTES:

1. PLUMBING FIXTURES ARE TO BE FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR FROM SPECIFICATIONS ON THE ARCHITECTURAL SET OF DRAWINGS PLUMBING CONTRACTOR IS TO COORDINATE WITH MANUFACTURER ON FIXTURE CODE COMPLIANCE AND MASSACHUSETTS APPROVAL COORDINATE ALL FIXTURE INSTALLATION DIMENSIONS WITH THE DETAILS ON THE ARCHITECTURAL DRAWINGS AND PER FAC REQUIREMENTS
2. ALL PLUMBING FIXTURES, FAUCETS, AND FLUSH VALVES SHALL BE FIELD ADJUSTED TO ENSURE PROPER CODE COMPLIANT OPERATION FOR TEMPERATURE AND FLOW
3. ALL HANDWASHING FIXTURES SHALL BE FIELD ADJUSTED TO LIMIT THE HOT WATER TEMPERATURE TO 110°F AS REQUIRED
4. PROVIDE SERVICE STOPS FOR ALL NEW FIXTURES ALL EXPOSED WATER & WASTE PIPING ASSOCIATED WITH FIXTURES SHALL BE CHROME FINISH PROVIDE ALL SUPPLIES, SERVICE STOPS, TAILPIECES, AND TRAPS FOR FIXTURES AS REQUIRED PROVIDE ALL FINAL CONNECTIONS
5. PROVIDE CONCEALED WALL CARRIERS FOR ALL WALL MOUNTED FIXTURES, CARRIERS SHALL BE BY ZURN OR APPROVED EQUAL.
6. PROVIDE PRE-MOLDED INSULATION KITS ON ALL WASTE & WATER PIPING, VALVES & FITTINGS DIRECTLY BELOW ACCESSIBLE FIXTURES INSULATION KIT TO BE BY TRUBRO

PLUMBING SYMBOLS LIST

-GW-	GREASE SANITARY SEWER
-W-	SANITARY SEWER
	VENT PIPING
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RETURN PIPING
	EXISTING HOT WATER PIPING
	EXISTING COLD WATER PIPING
G	GAS PIPING
	P-TRAP
	PIPE UP
	PIPE DROP
	CLEANOUT
	PLUGGED OUTLET/CLEANOUT
	POINT OF CONNECTION
	RECIRCULATION PUMP
	BALANCING VALVE
	BACK FLOW PREVENTER

PLUMBING ABBREVIATIONS

CO	CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
V	VENT
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
FD	FLOOR DRAIN
BFP	BACK FLOW PREVENTER
WH-1	WATER HEATER
N.I.C.	NOT IN CONTRACT
ET-1	EXPANSION TANK
RCP-1	HOT WATER CIRCULATION PUMP

PLUMBING DRAWING LIST

P001	PLUMBING LEGEND, NOTES & SPECIFICATIONS
P100	PLUMBING FLOOR PLANS
P200	PLUMBING RISERS DIAGRAMS
P300	PLUMBING DETAILS (1 OF 2)
P301	PLUMBING DETAILS (2 OF 2)
P400	PLUMBING SCHEDULES

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS

NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

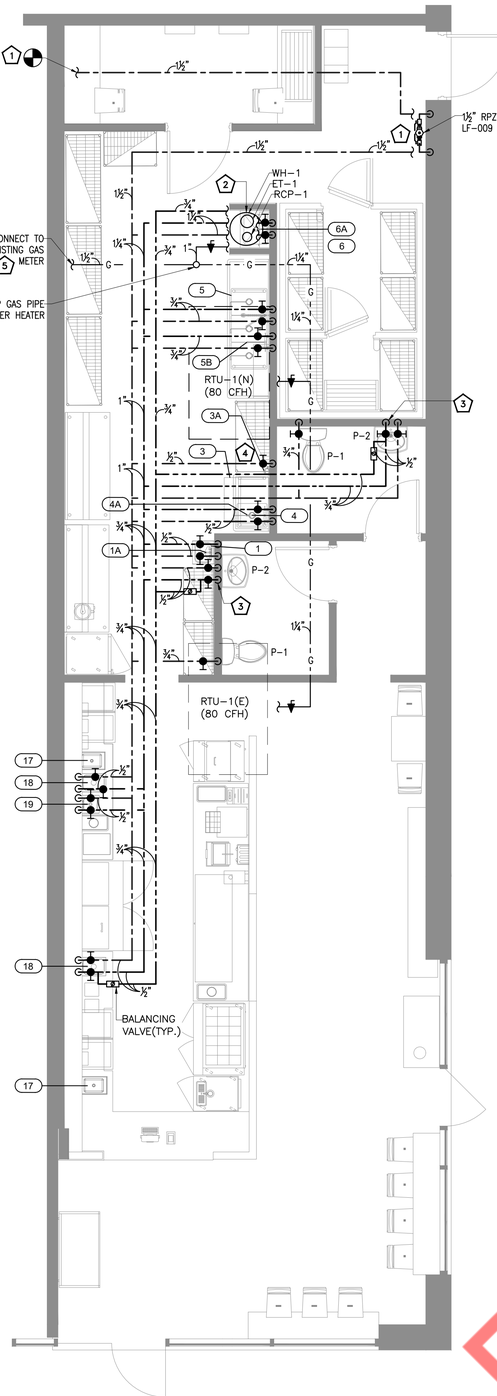
PROJECT NUMBER: 2209

DRAWING NAME:

PLUMBING LEGEND, NOTES & SPECIFICATIONS

DRAWING NO.

P001



GENERAL NOTES:

1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2020 MASSACHUSETTS ENERGY CODE (REFER SHEET P001)
2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
6. CONTRACTOR TO COORDINATE WITH STRUCTURAL ENGINEER FOR MOUNTING AND SUPPORT OF HOT WATER HEATER ABOVE MOP SINK.

DOMESTIC WATER AND GAS KEYED NOTE

1. CONNECT NEW 1-1/2" CW LINE TO EXISTING WATER MAIN LINE. CONTRACTOR TO FIELD VERIFY SIZE AND LOCATION OF WATER LINE. PROVIDE RPZ & WATER METER AS PER LOCAL BUILDING CODE IF NOT PROVIDED.
2. ROUTE T&P RELIEF TO DRAIN IN NEAREST FLOOR DRAIN.
3. PROVIDE ASSE 1070 OR SIMILAR APPROVED TEMPERING VALVE FOR LAVATORIES AND HAND SINK. SET AT TEMPERATURE TO A MAXIMUM 110 °F.
4. PROVIDE ASSE 1022 APPROVED WATTS SD-3 OR EQUIVALENT BACKFLOW PREVENTER FOR, ICE MAKER WITH BIN.
5. CONNECT NEW 1-1/2" GAS PIPING TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE, CAPACITY AND LOCATION IN FIELD AND UPGRADE GAS METER IF REQUIRED.

1 DOMESTIC WATER AND GAS PIPING
1/4" = 1'-0"

GENERAL NOTES:

1. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
3. WATER HEATER DRAIN SPILLS TO THE NEAREST FLOOR DRAIN.
4. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.

SANITARY KEYED NOTES:

1. CONNECT NEW 4" SANITARY TO EXISTING SANITARY STUB UP IN SPACE. CONTRACTOR TO VERIFY SIZE AND LOCATION IN FILED REFER CIVIL DRAWINGS FOR MORE DETAILS.
2. GREASE INTERCEPTOR, SCHIER GB-50, 50 GPM, 249 LBS CAPACITY 4" INLET W/ FLOW CONTROL 2" VENT UP. FIELD VERIFY EXACT PLACEMENT OF GREASE TRAP AND COORDINATE WITH FOOD SERVICE EQUIPMENT PLANS TO AVOID LEG CONFLICTS.
3. NEW 4" VENT THRU ROOF. CONTRACTOR TO FIELD VERIFY SIZE, ROUTING ON SITE.
4. ROUTE INDIRECT WASTE FROM ICE MAKER & WATER FILTRATION SYSTEM DRAIN TO FLOOR SINK WITH APPROVED AIR GAP.
5. ROUTE INDIRECT WASTE FROM THREE COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
6. ROUTE INDIRECT WASTE FROM ONE COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
7. GC TO CONFIRM REQUIREMENT OF FLOOR SINK WITH KITCHEN EQUIPMENT VENDOR AND ELIMINATE IF NOT REQUIRED.

1 SANITARY AND VENT PIPING PLAN
1/4" = 1'-0"

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

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ISSUED DATE: 08.12.22

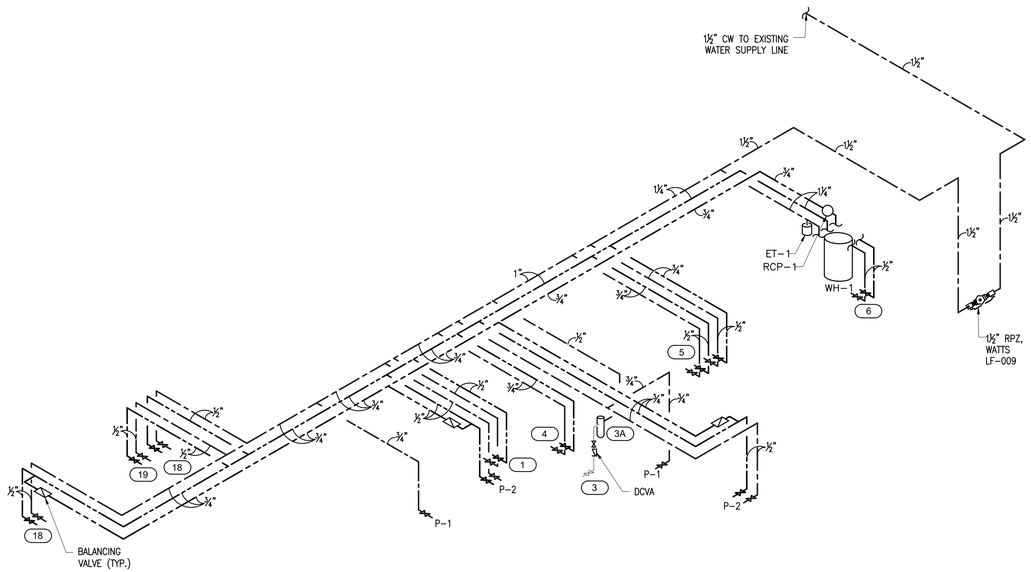
DRAWN BY: NYE
CHECKED BY: NYE
PROJECT NUMBER: 2209

DRAWING NAME:

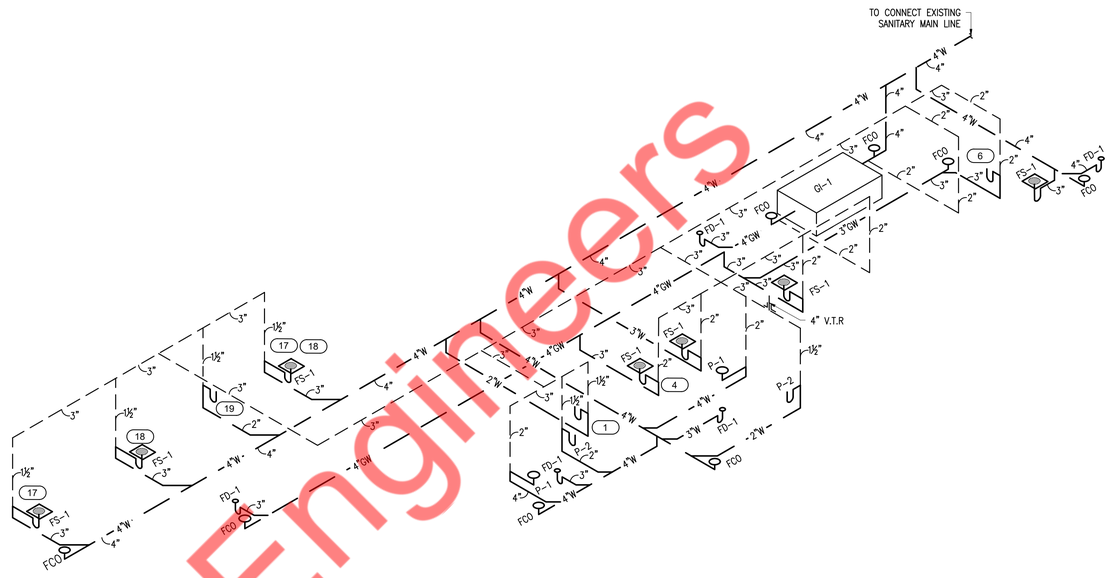
PLUMBING FLOOR PLANS

DRAWING NO.

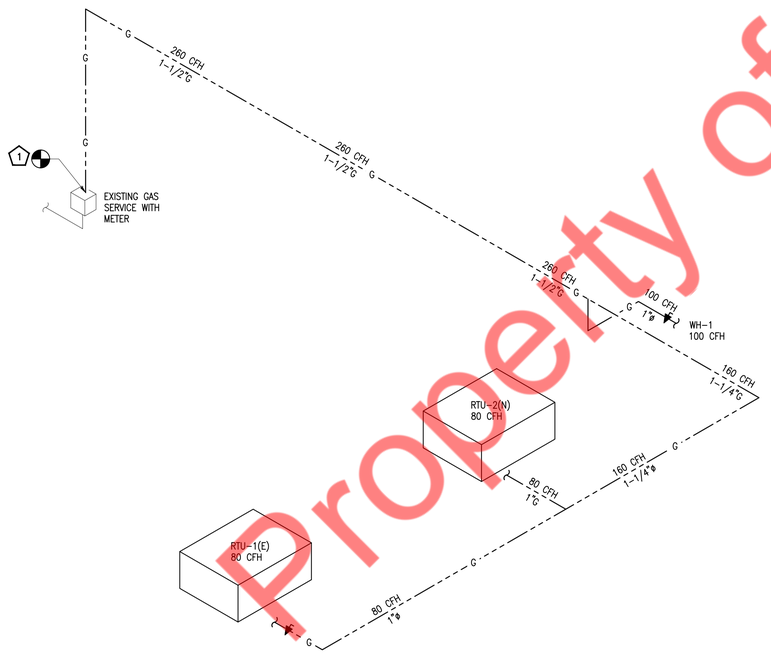
P100



1 DOMESTIC WATER ISOMETRIC DIAGRAM
SCALE: N.T.S



2 SANITARY AND VENT ISOMETRIC DIAGRAM
SCALE: N.T.S



3 GAS ISOMETRIC DIAGRAM
SCALE: N.T.S

GAS SCHEDULE			
ITEM NO.	DESCRIPTION	QTY.	LOAD
–	RTU-1(E)	1	80
–	RTU-2(N)	1	80
–	WH-1	1	100
		TOTAL	260

GAS KEYED NOTE

(1) CONNECT NEW 1-1/2" GAS PIPING TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE, CAPACITY AND LOCATION IN FIELD AND UPGRADE GAS METER IF REQUIRED.

NATURAL GAS PIPING SYSTEM
PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON THE DRAWINGS. PROVIDE EITHER THREADED STEEL OR MALLEABLE IRON PIPE WITH MALLEABLE FITTINGS OR WELDED STEEL. PROVIDE ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS REQUIRED BY NFPA-54 AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

NOTES:
1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWD FITTINGS
2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR.
3. VERIFY ALL EQUIPMENT BTU'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING TO NFPA 54 FUEL GAS CODE TABLE 6.2(a)

GAS PIPE SIZING PER TABLE 6.2(a) NFPA 54 FUEL GAS CODE

EQUIVALENT LENGTH OF PIPE = 259 FEET

ENGINEER:

CLIENT:
LIV'S JUICE BAR, LLC

PROJECT:
LIVS JUICE - WOBURN

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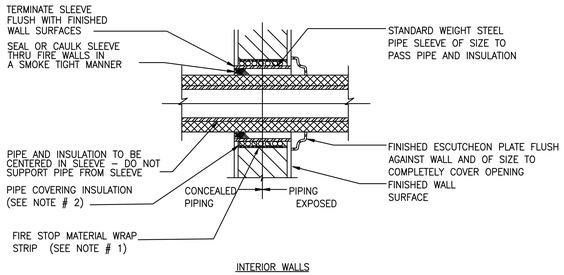
ISSUED DATE: 08.12.22

DRAWN BY: NYE
CHECKED BY: NYE
PROJECT NUMBER: 2209

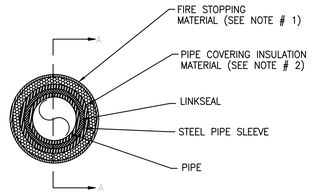
DRAWING NAME:
PLUMBING RISER DIAGRAMS

DRAWING NO.
P200



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.

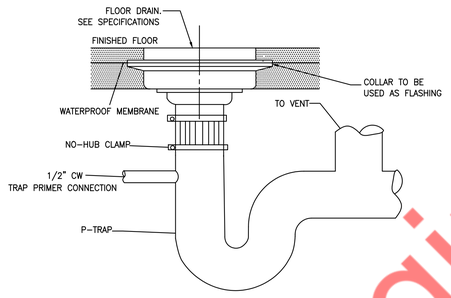


PIPE SLEEVE VIEW

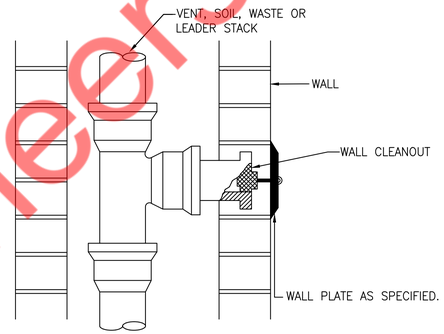
NOTES:

1. FIRESTOP MATERIAL WRAP STRIP SHALL BE ¼" 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. ¼" 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.

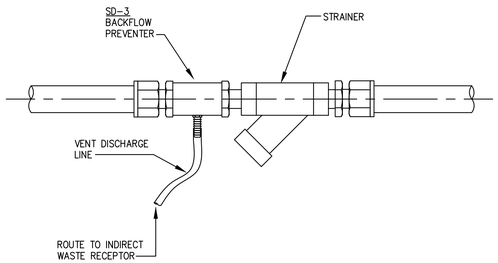
1 P300 N.T.S — PIPE SLEEVE THRU WALL SECTION



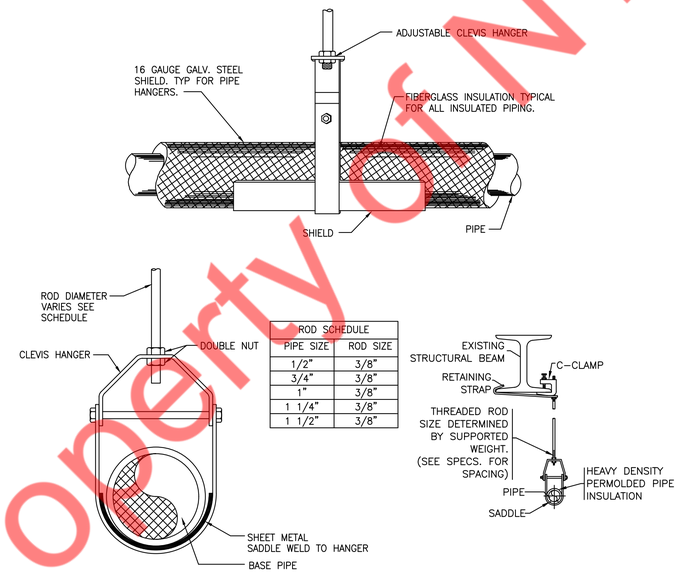
2 P300 N.T.S — FLOOR DRAIN DETAILS



3 P300 N.T.S — WALL CLEANOUT DETAIL



4 P300 N.T.S — BACKFLOW PREVENTION DETAILS



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"

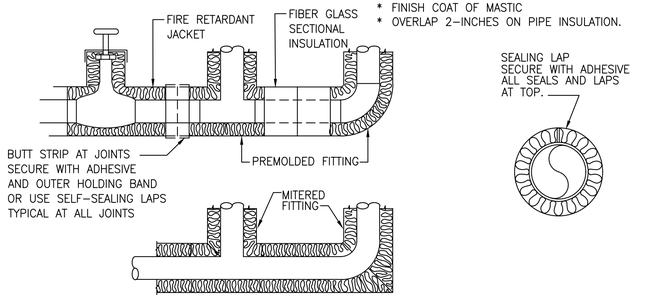
5 P300 N.T.S — HANGER DETAIL

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.



6 P300 N.T.S — INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

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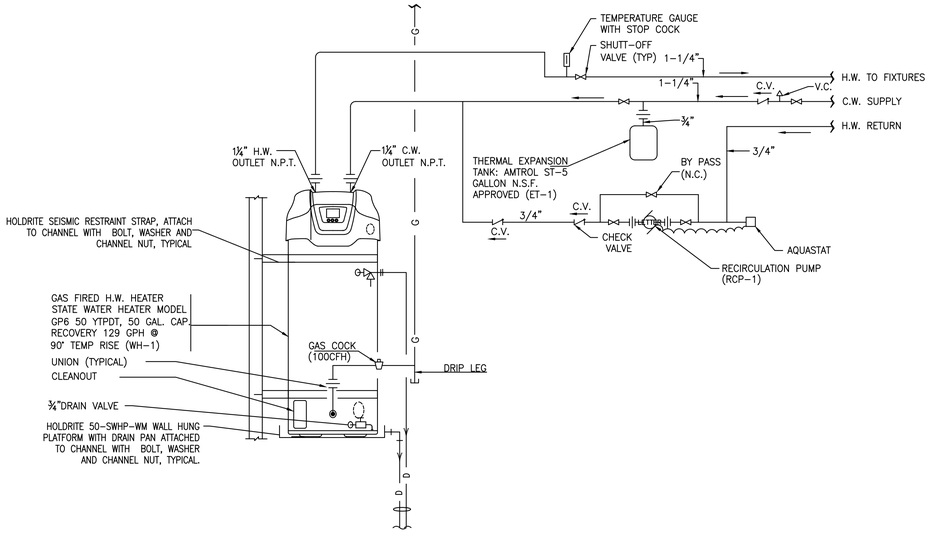
PROJECT NUMBER: 2209

DRAWING NAME:

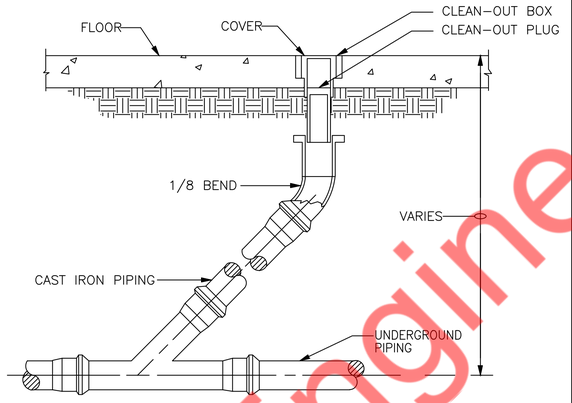
PLUMBING DETAILS (1 OF 2)

DRAWING NO.

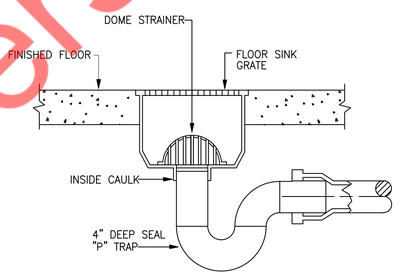
P300



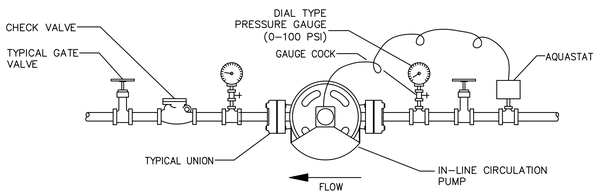
1 / P301 GAS FIRED WATER HEATER (SHELF MOUNTED) N.T.S



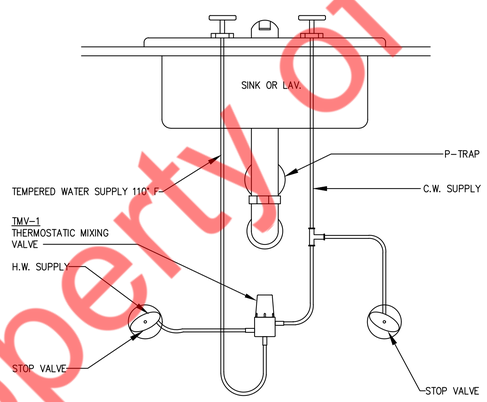
2 / P301 FLOOR CLEANOUT DETAIL N.T.S



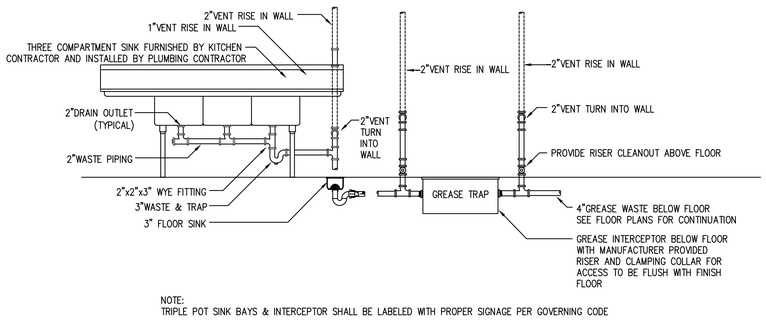
3 / P301 FLOOR SINK DETAILS N.T.S



4 / P301 INLINE RECIRCULATING PUMP DETAIL N.T.S



5 / P301 THERMOSTATIC MIXING VALVE (TMV-1) N.T.S



NOTE:
TRIPLE POT SINK BAYS & INTERCEPTOR SHALL BE LABELED WITH PROPER SIGNAGE PER GOVERNING CODE

6 / P301 TRIPLE COMPARTMENT POT SINK N.T.S

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

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PROJECT NUMBER: 2209

DRAWING NAME:

PLUMBING DETAILS (2 OF 2)

DRAWING NO.

P301

PLUMBING FIXTURE SCHEDULE

FIXTURE	QTY.	EQUIPMENT CATEGORY	DIRECT DRAIN SIZE(IN)	INDIRECT DRAIN SIZE(IN)	VENT	CW	HW
P-1	2	WATER CLOSET	4"	–	2"	3/4"	–
P-2	2	LAVATORY	2"	–	1-1/2"	1/2"	1/2"
1	1	HAND SINK	2"	–	1-1/2"	–	–
1A	1	WALL/SPLASH MOUNT FAUCET	–	–	–	1/2"	1/2"
3	1	ICE MAKER	–	3/4"	–	1/2"	–
3A	1	WATER FILTRATION SYSTEM	–	–	–	1/2"	–
4	1	PREP SINK	–	1-1/2"	2"	–	–
4A	1	WALL/SPLASH MOUNT FAUCET	–	–	–	1/2"	1/2"
5	1	3 COMPARTMENT SINK	–	2"	2"		
5B	1	PRE RINSE FAUCET ASSEMBLY	–	–		3/4"	3/4"
6	1	MOP SINK	2"	–	2"	–	–
6A	1	SERVICE FAUCET	–	–	–	1/2"	1/2"
17	2	DROP-IN ICE BIN	–	1"	–	–	–
18	2	DROP-IN SINK	–	1-1/2"	–	1/2"	1/2"
19	1	DROP-IN HAND SINK	1-1/2"	–	–	–	–
19A	1	PANTRY FAUCET	–	–	–	1/2"	1/2"
FD-1	5	FLOOR DRAIN	3"/4"	–	2"		–
FS-1	6	FLOOR SINK	3"	–	2"	–	–

NOTE: ALL FIXTURE MAY BE SUBSTITUTED WITH APPROVED EQUAL. CONTACT OWNER FOR APPROVAL. REFER KITCHEN EQUIPMENT PLAN AND SCHEDULE FOR MORE DETAILS.

THERMOSTATIC MIXING VALVE SCHEDULE

TAG	LOCATION	MANUFACTURER	MODEL	MIN OUTLET FLOW (GPM)	COMMENTS
TMV	HANDWASH SINKS / LAVATORY	SYMMONS MAXLINE	7-210	0.5	SET TO 110° AT ALL SINKS FOR HANDWASHING

DRAIN SCHEDULE

TAG	DESIGNATION	MANUFACTURER	MODEL	OUTLET	STRAINER	COMMENTS
FD-1	FLOOR DRAIN	WATTS	FD-100	3"/4"	NICKEL BRONZE	CAST IRON BODY, NO-HUB. PROVIDE THE FOLLOWING OPTIONS: -7
FS-1	FLOOR SINK	WATTS	FS-730	3"	PORCELAIN	CAST IRON BODY, NO-HUB. PROVIDE THE FOLLOWING OPTIONS: -FC, -7, -150

NOTES: PROVIDE TRAP PRIMER PPP PR-500

GREASE INTERCEPTOR SCHEDULE

TAG	LOCATION	MANUFACTURER	MODEL	FLOW RATE (GPM)	INLET/OUTLET	COMMENTS
GI-1	KITCHEN	SCHIER	GB-50	50	4"/4"	COVER SHALL BE FLUSH WITH FINISH FLOOR. COORDINATE FINAL LOCATION & ELEVATIONS IN FIELD. PROVIDE FIELD CUT RISER FOR FLUSH WITH FINISH FLOOR ACCESS INSTALLATION

NOTES
1. GREASE INTERCEPTOR TO BE COORDINATED & CONFIRMED TO FIT AT LOCATION SHOWN & MAKE ALL REQUIRED CONNECTIONS PRIOR TO PURCHASE COORDINATE WITH GENERAL CONTRACTOR
2. CONTRACTOR TO PROVIDE ALL REQUIRED ACCESSORIES FOR SATISFACTORILY WORKING AS PER SITE CONDITIONS.

EXPANSION TANK

UNIT	NUMBER	MANUFACTURER & MODEL NUMBER	SERVICE	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	PRESSURE RATING (PSI)	DIMENSIONS		OPERATING WEIGHT (LBS)	NOTES
							DIAMETER (INCH)	HEIGHT (INCH)		
ET-1	1	AMTROL	ST-5	2	0.9	150	8	12.5	25	1

HOT WATER CIRCULATION PUMP SCHEDULE

TAG	LOCATION	MANUFACTURER	MODEL	TYPE	FLOW (GPM)	HEAD (FT)	ELECTRICAL				COMMENTS
							VOLT	HP	PHASE	hZ	
RCP-1	ABOVE WATER HEATER	GRUNDFOS	UP 15-18 B5	IN-LINE	2	6	120	0.12	1	60	PROVIDE AQUASTAT WITH TIMER KIT.

GAS FIRED STORAGE HOT WATER HEATER SCHEDULE

TAG	LOCATION	MANUFACTURER	MODEL	TYPE	LOAD (CFH)	STORAGE (GAL)	RECOVERY (GPH @ 90°F RISE)	ELECTRICAL			COMMENTS
								VOLT	PHASE	HZ	
WH-1	ABOVE MOP SINK	STATE WATER HEATER	GP6-50-YTPT	GAS	100	50	129	120	1	60	– DIMENSIONS: 22"D X 66¾"H – P.C. TO PROVIDE WATER HEATER PAN, WITH DISCHARGE TO FLOOR DRAIN. – WEIGHT – 255 LBS

NOTES:
1. WATER SHALL BE PRODUCED AT 140°F
2. PROVIDE STARTUP BY FACTORY CERTIFIED TECHNICIAN AND STANDARD MANUFACTURERS WARRANTY
3. WATER HEATER SHALL COME COMPLETE WITH TEMPERATURE AND PRESSURE RELIEF VALVE AND TANK DRAIN VALVE
4. PROVIDE VACUUM BREAKER RELIEF VALVE(S) AS REQUIRED BY THE STATE PLUMBING CODE INSTALL IN MULTIPLES IS REQUIRED

GREASE TRAP SIZING CALCULATION

FIXTURE	QUANTITY	DIMENSIONS			VOLUME		PERCENTAGE USAGE(%)	ACTUAL USAGE (GALLONS)	FLOW RATE(GPM)	
		LENGTH(IN)	WIDTH(IN)	DEPTH(IN)	CUBIC INCHES	GALLONS			1 MIN.	2 MIN.
3 COMP. SINK	3	18	24	14	18144	78.5	0.75	58.9	58.9	29.5
1 COMP. SINK	1	16	20	14	4480	19.4	0.75	14.5	14.5	7.3
								TOTAL:	58.9	29.45
PROPOSED GREASE TRAP: SCHIER GB-50										

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

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CHECKED BY: NYE
PROJECT NUMBER: 2209

DRAWING NAME:

PLUMBING SCHEDULES

DRAWING NO.

P400

SPRINKLER GENERAL NOTES

1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.–13 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 (1) 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 AND N.F.P.A.–13, HYDROSTATIC TESTS IN ACCORDANCE WITH REFERENCE STANDARD NFPA 13–2012, AS MODIFIED FOR COMMONWEALTH OF MASSACHUSETTS, 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.
26. WET SPRINKLER SYSTEM SUBJECTED TO FREEZING SHOULD COMPLY WITH CMR 780 MASSACHUSETTS STATE BUILDING CODE, 9TH EDITION AMENDED TO 2015 INTERNATIONAL BUILDING CODE, SECTION 903.

BUILDING DEPARTMENT SPRINKLER NOTES

1. THE INSTALLATION, COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION AND TYPE OF SYSTEMS SHALL CONFORM TO THE CMR 780 MASSACHUSETTS STATE BUILDING CODE, 9TH EDITION AMENDED TO 2015 INTERNATIONAL BUILDING CODE, SECTION 903.
2. ONLY APPROVED MATERIALS SHALL BE USED AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
3. DIRECT CONNECTION OF SPRINKLERS TO THE PUBLIC WATER SYSTEM SHALL CONFORM TO 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
4. SPRINKLER SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
5. INSPECTION AND TESTS OF SPRINKLERS SHALL BE CONDUCTED AS SEC. 901.5 AND 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE, SECTION 1.05.
6. THE OCCUPANCY OF THE AREAS TO BE SPRINKLER IN ACCORDANCE WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05, CHAPTER 4.
7. WATER SUPPLY TEST PIPES AND GAUGES SHALL BE PROVIDED AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
8. PIPING, FITTINGS, SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION, DAMAGE, VALVES, HANGERS, SPRINKLERS GUARDS AND SHIELDS SHALL BE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
9. STOCK OF EXTRA SPRINKLERS WILL BE FURNISHED AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05. (REQUIRED FOR EACH TEMPERATURE RATING).
10. SPRINKLER ALARM SHALL BE IN ACCORDANCE WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
11. SPACING, LOCATION AND POSITION OF SPRINKLER WILL BE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
12. ALL BLIND SPACES EXCEEDING 6" IN WIDTH OR DEPTH WHICH CONTAIN COMBUSTIBLE MATERIAL WILL BE SPRINKLERED.
13. ALL PIPE PASSING THROUGH WALLS WILL COMPLY WITH SECTION BC711.2
14. THERE IS NO HIGH PILED STORAGE AS DEFINED IN 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
15. 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.
16. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
17. DRAINAGE SHALL CONFORM TO 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
18. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IS MADE IN THE SIZE OF PIPE, AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
19. ALL VALVES ON CONNECTIONS TO WATER SUPPLIES TO SPRINKLER SHALL BE APPROVED O.S. & Y. OR APPROVED INDICATOR TYPE.
20. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
21. 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 CHAPTER 9.
22. PROVISIONS SHOULD BE MADE TO FACILITATE FLUSHING SYSTEM PIPING BY PROVIDING FLUSHING CONNECTIONS CONSISTING OF A CAPPED NIPPLE 4" LONG ON END OF A CROSS MAIN AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
23. SPRINKLER SHALL BE AN APPROVED TYPE AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
24. TEMPERATURE RATING SHALL COMPLY WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
25. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
26. SPACING AND LOCATION OF SPRINKLERS SHALL COMPLY WITH 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
27. SPRINKLER SYSTEM COMPLIES WITH 13–2013 AS MODIFIED BY 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
28. SOURCES OF WATER SUPPLY FOR SPRINKLER SYSTEMS AS PER 527 CMR 1.00 MASSACHUSETTS COMPREHENSIVE FIRE SAFETY CODE SECTION 1.05.
29. PIPE SCHEDULE SYSTEMS SHALL BE IN ACCORDANCE WITH CHAPTER 9, SECTION 903.3.
30. HYDRAULICALLY DESIGNED SYSTEMS SHALL BE IN ACCORDANCE WITH CHAPTER 9 SECTION 903.3.
31. MINIMUM BRANCH PIPE SIZE TO BE ONE INCH (1").
32. 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.

SPRINKLER DRAWING LIST

SP001 SPRINKLER GENERAL NOTES, SYMBOLS AND SPECIFICATIONS

SP002 SPRINKLER SPECIFICATIONS

SP100 SPRINKLER FLOOR PLAN

SP200 SPRINKLER DETAILS

SPACING BETWEEN SPRINKLER HEADS

LIGHT HAZARD: 15' MAX.
ORDINARY HAZARD: 15' MAX

NOTE: MAXIMUM DISTANCE BETWEEN SPRINKLER HEADS & WALLS IS ½ 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 RESTAURANT SERVING 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.

FIRE PROTECTION SYSTEM INTENT

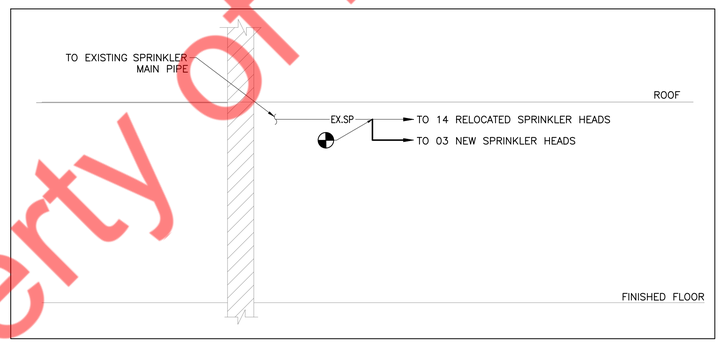
1. ALL WORK SHALL BE INSTALLED IN CONFORMANCE WITH NFPA 13.
2. PERFORM A NEW FLOW TEST OR OBTAIN A RECENT FLOW TEST AND USE THE RESULTS WHEN PREPARING HYDRAULIC CALCULATIONS.
3. PROVIDE A COMPLETE WET SPRINKLER SYSTEM, IN ACCORDANCE WITH NFPA 13.

SCOPE OF WORK:

1. THE SPRINKLER SYSTEM IS DESIGNED AS PER NFPA 13.

SPRINKLER LEGEND

EX.SP	EXISTING SPRINKLER PIPING TO REMAIN
SP	NEW SPRINKLER PIPING
	SPRINKLER PIPE TO BE DEMOLISHED
(N)	NEW CONCEALED SPRINKLER HEAD
(N)	NEW UPRIGHT SPRINKLER HEAD
	SPRINKLER CAPPED OUTLET
	EXISTING UPRIGHT SPRINKLER HEAD
(D)	DRY PENDENT SPRINKLER HEAD
	SPRINKLER PIPING POINT OF CONNECTION
	SPRINKLER PIPING POINT OF DISCONNECTION
	PIPE THRU RATED WALL
	EXISTING SPRINKLER VALVE
	EXISTING DRAIN VALVE
(REL) (N)	DISCONNECT AND REMOVE EXISTING UPRIGHT SPRINKLER HEAD WITH BRANCH PIPING AND CAP (TYP.). CONNECT NEW CONCEALED SPRINKLER HEAD WITH BRANCH PIPING AND EXTEND TO NEW LOCATION AS SHOWN ON FLOOR PLAN



SPRINKLER RISER DIAGRAM

MASSACHUSETTS THREE TIER PROCESS

THIS PROJECT SHALL BE DESIGNED AND CONSTRUCTED UNDER THE THREE TIER SYSTEM, PER THE MASSACHUSETTS BUILDING CODE, 780 CMR, CHAPTER 9.

A. TIER ONE, CONSTRUCTION DOCUMENTS

1. PRIOR TO ISSUANCE OF A BUILDING PERMIT, CONSTRUCTION DOCUMENTS FOR THE FIRE PROTECTION SYSTEM MUST BE SUBMITTED AND A BUILDING PERMIT OBTAINED PRIOR TO THE INSTALLATION OF FIRE PROTECTION SYSTEMS OR MODIFICATIONS, ALTERATIONS, ADDITIONS OR DELETIONS TO AN EXISTING FIRE PROTECTION SYSTEM.
2. THE CONSTRUCTION DOCUMENTS SHALL CONTAIN CONFORM TO ALL REQUIREMENTS LISTED IN THE BUILDING CODE.

B. TIER TWO, SHOP DRAWINGS

1. PRIOR TO INSTALLATION OF FIRE PROTECTION SYSTEMS, SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL BE PREPARED BY THE CONTRACTOR.
2. DRAWINGS SHALL CONFORM TO ALL REQUIREMENTS LISTED IN THE BUILDING CODE. THE SHOP DRAWINGS AND HYDRAULIC CALCULATIONS SHALL THEN BE SUBMITTED TO THE ENGINEER OF RECORD. WHEN THE ENGINEER OF RECORD IS SATISFIED WITH THE DRAWINGS, THEY WILL BE SEALED.
3. THE CONTRACTOR SHALL THEN SUBMIT DRAWINGS AND HYDRAULIC CALCULATIONS TO THE BUILDING OFFICIAL AND FIRE OFFICIAL, AND OBTAIN APPROVAL.

C. TIER THREE, RECORD DRAWINGS

1. AS BUILT PLANS SHALL BE PROVIDED TO THE BUILDING OWNER FOR ALL FIRE PROTECTION AND LIFE SAFETY SYSTEMS THAT ARE SEALED AS REVIEWED AND APPROVED BY THE ENGINEER OF RECORD, PERFORMING CONSTRUCTION CONTROL.
2. SHOP DRAWINGS SHALL BE MODIFIED AS NECESSARY, WITH ANY FIELD CHANGES IDENTIFIED BY CLOUDS ON THE DRAWINGS.
3. WHEN THE ENGINEER OF RECORD IS SATISFIED WITH THE DRAWINGS AND HYDRAULIC CALCULATIONS, THEY WILL BE SEALED. THESE COMPLETED DOCUMENTS WILL THEN BE INCORPORATED INTO THE OPERATION & MAINTENANCE MANUALS, AND DELIVERED TO THE OWNER.

SPRINKLER SCHEDULE

SYMBOL	NAME	COVERAGE	AREA	METAL	TEMPERATURE (°F)	K-FACTOR	NPT	MFG	MODEL#	APPROVALS
●	CONCEALED	STANDARD	LH/OH AREAS WITH CEILING	BRASS	155	5.6	½"	TYCO	SERIES RF–II TY3531	UL/FM
○(D)	DRY PENDANT	STANDARD	WALK IN FREEZER/COOLER	BRASS	155	5.6	1"	TYCO	SERIES DS–1 TY3255	UL/FM
⊙	UPRIGHT	STANDARD	LH/OH OPEN AREAS	BRASS	155	5.6	½"	TYCO	SERIES TY–B TY315	UL/FM

NOTE: 1. COORDINATE ALL SPRINKLER COLOR FINISHES WITH ARCHITECT.
2. ALL SPRINKLER SHOULD BE MEA APPROVED

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS		
NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

PROJECT NUMBER: 2209

DRAWING NAME:

SPRINKLER GENERAL NOTE, SYMBOL & SPECIFICATION

DRAWING NO.

SP001

SPRINKLER SPECIFICATIONS

SPRINKLER DEMOLITION NOTES

1. PROVIDE ALL LABOR, APPARATUS, ETC, FOR THE REMOVAL OF ALL EXISTING SPRINKLER HEADS, PIPING, HANGERS, ETC. EXCEPT AS INDICATED.
2. MAINTAIN CONTINUOUS OPERATION OF EXISTING RISERS SO AS NOT TO INCONVENIENCE OTHER BUILDING TENANTS.
3. SPRINKLER CONTRACTOR SHALL VISIT THE PREMISES PRIOR TO SUBMITTING ITS PROPOSAL AND EXAMINE THE AREAS EFFECTED BY THIS WORK. HE IS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH POSSIBLE DIFFICULTIES THAT MAY ATTEND THE EXECUTION OF THIS WORK.
4. PERFORM THIS WORK SIMULTANEOUSLY WITH THAT OF OTHER TRADES SO AS NOT TO DELAY OVERALL PROGRESS OF WORK.
5. OWNER'S OCCUPANCY REGULATIONS MAY REQUIRED THAT CERTAIN PORTIONS OF WORK BE DONE AFTER REGULAR WORKING HOURS. COORDINATE WITH BUILDING MANAGEMENT. COST OF OVERTIME IS TO BE INCLUDED IN THE CONTRACTOR'S PROPOSAL.
6. REMOVE ALL DEMOLITION MATERIALS FROM PROJECT SITE, EXCEPT ITEMS DESIGNATED BY ARCHITECT/OWNER TO REMAIN OWNER'S PROPERTY AND BE STORED.
7. NO DEAD ENDS SHALL BE LEFT ON PIPING.
8. EXISTING EXPOSED PIPING NOT BEING REUSED, AND NOT SPECIFICALLY NOTED OR SHOWN ON DRAWING TO BE ABANDONED SHALL BE COMPLETELY REMOVED.
9. THE EXISTING SYSTEM SHALL BE LEFT IN PERFECT WORKING ORDER AT COMPLETION OF NEW WORK.
10. NO REMOVED EXISTING PIPING SHALL BE REUSED.
11. DO NOT USE ANY PART OF THE BUILDING AS A SHOP EXCEPT PARTS DESIGNATED FOR SUCH PURPOSES.
12. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A. – 13 AND ALL LOCAL AUTHORITIES.
13. CONTRACTOR SHALL FIELD VERIFY EXACT ELEVATION, LOCATION AND PIPE SIZES OF EXISTING SPRINKLER HEADS AND PIPING BEFORE INSTALLATION OF NEW WORK.
14. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.
15. A FIRE WATCH GUARD WITH A CERTIFICATE OF FITNESS SHALL BE MAINTAINED DURING SHUT DOWNS.
16. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR IS RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.
17. PIPE SIZE TO BE MINIMUM OF ONE INCH (1").
18. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER.
19. CONTRACTORS SHALL TAKE SPECIAL CARE TO DEMOLISH ONLY THAT WORK WHICH IS REQUIRED TO BE DEMOLISHED AND NOT TO DISTURB ANY WORK WHICH IS TO REMAIN. IF IN THE COURSE OF THE DEMOLITION, THE CONTRACTOR DESTROYS OR DISTURBS ANY WORK WHICH IS TO REMAIN, THEN HE SHALL, AT HIS OWN EXPENSE, REPAIR OR REPLACE SUCH WORK AS NECESSARY.
20. EXISTING PIPING SERVING ADJACENT AREAS NOT IN AREA OF WORK SHALL REMAIN ACTIVE AND WITHOUT DISTURBANCE
21. AFTER REMOVAL OF CEILINGS, CONSTRUCTION MANAGER SHALL INSPECT THE SITE WITH BUILDING REPRESENTATIVES TO IDENTIFY BASE BUILDING MEP INFRASTRUCTURE ITEMS WHICH ARE TO REMAIN. ALL SUCH ITEMS ARE TO BE CLEARLY TAGGED "TO REMAIN" AND TO BE PROTECTED DURING DEMOLITION, IN A MANNER SATISFACTORY TO BUILDING MANAGEMENT.

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 STATE OF MASSACHUSETTS.

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 THE LOCAL BUILDING CODE, N.F.P.A. STANDARD 13, MASSACHUSETTS 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 MASSACHUSETTS 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

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, AND MASSACHUSETTS BUILDING CODE.

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 THE LOCAL BUILDING CODE 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 MASSACHUSETTS BUILDING CODE 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.

2.04 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.

2.05 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.

2.06 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

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 MASSACHUSETTS BUILDING CODE.

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. CABINET SHALL BE CONSTRUCTED OF 22 GAUGE STEEL WITH PRIME COAT AND MANUFACTURER'S BAKED ENAMEL FINISH IN COLOR SELECTED BY THE ARCHITECT.
2. SPRINKLER HEADS IN FINISHED CEILINGS WITH CONCEALED PIPING SHALL BE AUTOMATIC TYCO MODEL TY3531.
3. UPRIGHT SPRINKLER HEAD SHOULD BE AUTOMATIC TYCO MODEL TY315.
4. DRY SPRINKLER HEAD SHOULD BE AUTOMATIC TYCO MODEL TY3255

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.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS

NO.	DATE	DESCRIPTION

SEAL:

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ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

PROJECT NUMBER: 2209

DRAWING NAME:

SPRINKLER SPECIFICATION

DRAWING NO.

SP002

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

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY TO INSTALL ALL SPRINKLER HEADS TO BE MAX. 12" FROM CEILING.
2. ALL NEW SPRINKLER HEADS LOCATION TO BE COORDINATED WITH LIGHTING AND DIFFUSERS TO AVOID CONFLICT.
3. ALL SPRINKLER HEADS & PIPING TO BE COORDINATED WITH EXISTING & NEW SERVICES.
4. ANY WORK SHOWN ON THE DRAWINGS AND NOT PARTICULARLY DESCRIBED IN THE SPECIFICATIONS OR DETAILS, OR ANY WORK WHICH MAY BE DEEMED NECESSARY TO COMPLETE THE CONTRACT SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS CONTRACT.
5. FOR PURPOSES OF CLEARNESS AND LEGIBILITY, SPRINKLER DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND SIZE AND LOCATION OF EQUIPMENT ARE DRAWN TO SCALE WHEREVER POSSIBLE. THE DRAWINGS INDICATE CONNECTION POINTS, AND ROUTED OF PIPES. IT IS NOT INTENDED, HOWEVER, THAT ALL OFFSETS, RISES AND DROPS ARE SHOWN. PROVIDE PIPING AS REQUIRED TO FIT STRUCTURE, AVOID OBSTRUCTIONS, AND RETAIN CLEARANCES, HEADROOM OPENINGS AND PASSAGEWAYS. ALL SPRINKLER PIPING AT CEILING SHALL BE ROUTED TIGHT TO EXISTING SLAB AS REQUIRED.
6. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION IF REQUIRED AS PER STRUCTURAL REQUIREMENT.
7. ALL SPRINKLER HEADS & PIPING TO BE COORDINATED WITH EXISTING & NEW SERVICES.
8. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND SIZE OF EXISTING SYSTEM. ALL PENDANT SPRINKLERS MUST BE SPACED AS FOLLOWS –
   1. MAXIMUM 7.5' FROM WALL
   2. MAXIMUM DISTANCE BETWEEN 2 SPRINKLER HEADS IS 15'.
   3. MINIMUM DISTANCE BETWEEN 2 SPRINKLER HEADS IS 6'.
   4. COVERAGE AREA PER SPRINKLER SHALL BE MAX. 225 SQ.FT.
9. ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.
10. AUXILIARY DRAIN SHALL BE PROVIDED AT THE TRAPPED SECTIONS.
11. ALL EXISTING SPRINKLER SYSTEM AT THIS FLOOR TO BE DEMOLISHED UNLESS OTHERWISE NOTED.
12. FOR SPRINKLER WORK ONLY.

SPRINKLER KEYNOTES

1. ALL BRANCH TAKE-OFF FOR EACH SPRINKLER TO BE MIN. 1".
2. EXISTING SPRINKLER PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY EXACT ROUTING & SIZING ON FIELD.
3. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING SPRINKLER.

SPRINKLERS	
EXISTING UPRIGHT HEADS TO CONCEALED HEAD BE RELOCATED	09
EXISTING UPRIGHT HEADS TO BE RELOCATED	05
EXISTING UPRIGHT HEADS TO BE REMOVED	02
NEW DRY SPRINKLER HEAD	02
NEW CONCEALED HEAD	01
TOTAL	19

HAZARD CLASSIFICATION AND DESIGN DENSITY:	
AREA : KITCHEN AREA	
OCCUPANCY:	ORDINARY HAZARD
MINIMUM DESIGN DENSITY:	0.15 GPM/SQ. FT.
AREA : DINING AREA	
OCCUPANCY:	LIGHT HAZARD
MINIMUM DESIGN DENSITY:	0.1 GPM/SQ. FT.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

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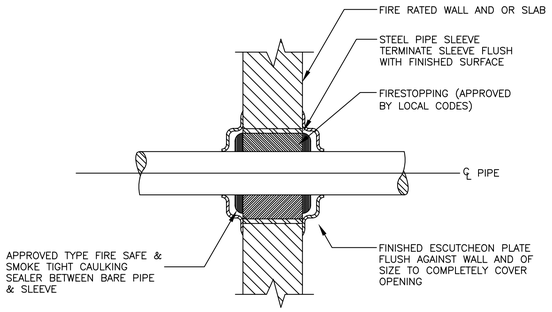
DRAWING NAME:

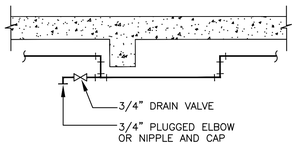
SPRINKLER FLOOR PLAN

DRAWING NO.

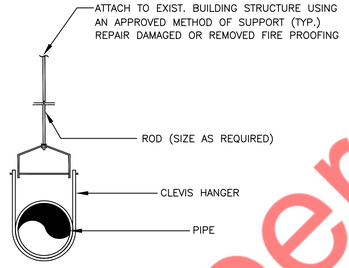
SP100



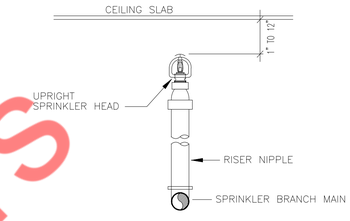
1 / SP200 — PIPE THRU RATED WALL TYPICAL DETAIL
N.T.S



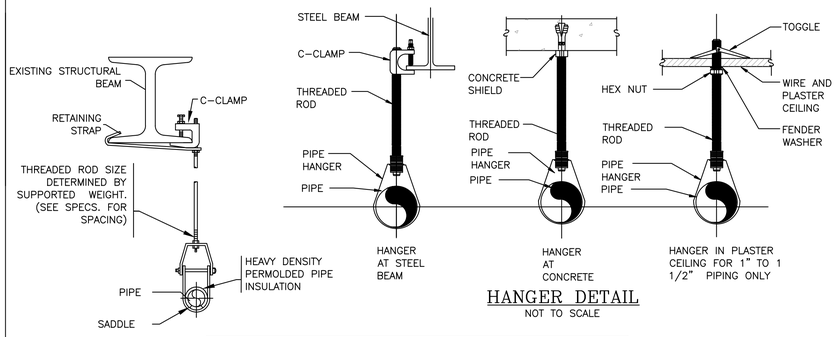
2 / SP200 — TYPICAL DRAIN CONNECTION FOR TRAPPED LINES ON WET PIPE SPRINKLER SYSTEMS
N.T.S



3 / SP200 — HANGER DETAILS TYPICAL
N.T.S



4 / SP200 — SPRINKLER HEAD DETAIL UPRIGHT
N.T.S

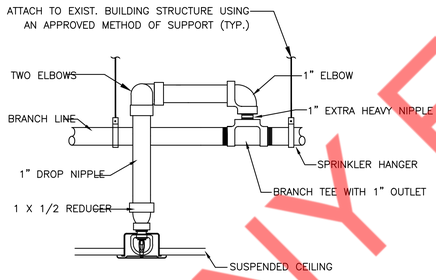


HANGER DETAIL
NOT TO SCALE

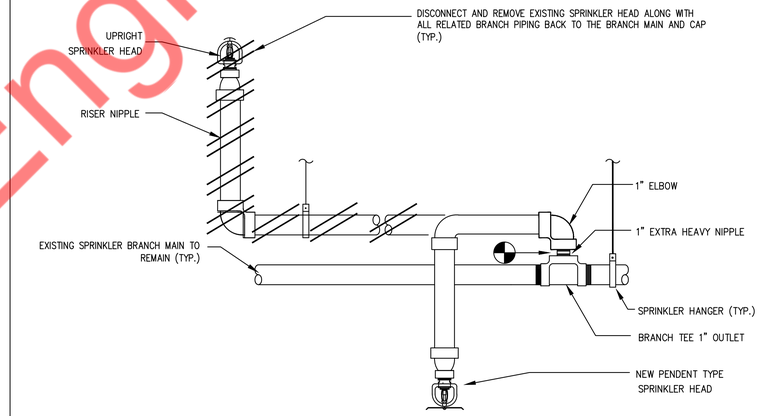
ROD SCHEDULE

PIPE SIZE	ROD SIZE	SPACING	PIPE SIZE	ROD SIZE	SPACING
1"	3/8"	5'–8'	2 1/2"	1/2"	10'–12'
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'			

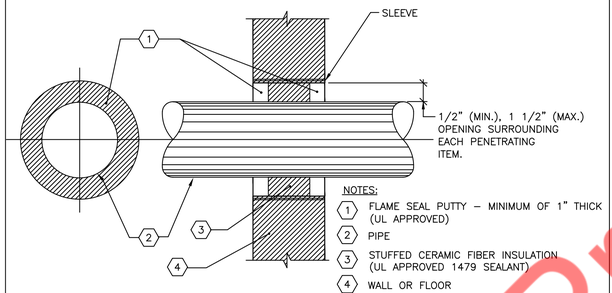
5 / SP200 — TYPICAL HANGER DETAIL AND ROD SCHEDULE
N.T.S



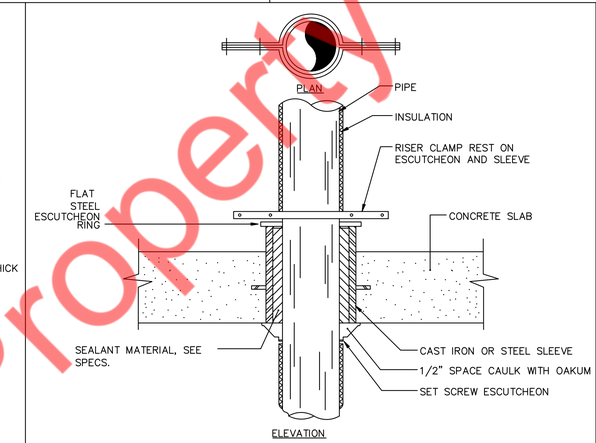
6 / SP200 — SPRINKLER HEAD IN SUSPENDED CEILING DETAIL
N.T.S



7 / SP200 — UPRIGHT HEAD TO PENDENT HEAD RELOCATION DETAIL
N.T.S



8 / SP200 — FIRE STOPPING DETAIL FOR FIRE/SMOKE RATED WALL/FLOOR OPENINGS
N.T.S



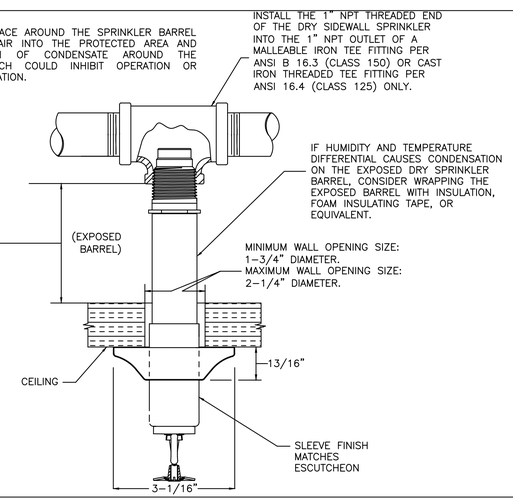
9 / SP200 — SPRINKLER RISER CLAMP DETAIL
N.T.S

AMBIENT TEMPERATURE OF PROTECTED AREA* AT THE DISCHARGE END OF THE SPRINKLER	EXPOSED BARREL AMBIENT TEMPERATURE 40°F/4°C | 50°F/10°C | 60°F/16°C EXPOSED MINIMUM BARREL LENGTH** FACE OF THE TEE TO THE OUTER SURFACE OF THE WALL		
	INCHES.	INCHES.	INCHES.
40°F (4°C)	0	0	0
30°F (–1°C)	0	0	0
20°F (–7°C)	4	0	0
10°F (–12°C)	8	1	0
0°F (–18°C)	12	3	0
–10°F (–23°C)	14	4	1
–20°F (–29°C)	14	6	3
–30°F (–34°C)	16	8	4
–40°F (–40°C)	18	8	4
–50°F (–46°C)	20	10	6
–60°F (–51°C)	20	10	6

* THE PROTECTED AREA REFERS TO THE AREA BELOW THE CEILING. THE AMBIENT TEMPERATURE IS THE TEMPERATURE AT THE DISCHARGE END OF THE SPRINKLER. FOR PROTECTED AREA TEMPERATURES THAT OCCUR BETWEEN THE VALUES LISTED, USE THE NEXT COOLER TEMPERATURE.

** THE MINIMUM REQUIRED BARREL LENGTH IS NOT THE SAME AS THE "A" DIMENSION. EXPOSED MINIMUM BARREL LENGTHS ARE INCLUSIVE UP TO 30 MPH WIND VELOCITIES.

SEAL THE CLEARANCE SPACE AROUND THE SPRINKLER BARREL TO AVOID LEAKAGE OF AIR INTO THE PROTECTED AREA AND CONSEQUENT FORMATION OF CONDENSATE AROUND THE SPRINKLER FRAME, WHICH COULD INHIBIT OPERATION OR CAUSE PREMATURE OPERATION.



10 / SP200 — DRY PENDANT SPRINKLER INSTALLATION DETAILS
N.T.S

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

LIVS JUICE - WOBURN

PROJECT:

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SPRINKLER DETAILS

DRAWING NO.

SP200

FIRE ALARM SYSTEM GENERAL SPECIFICATION:

A. DESCRIPTION:

1. THE ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL AND PLACE IN OPERATING CONDITION, A COMPLETE FIRE ALARM SYSTEM AS SPECIFIED IN THIS SECTION, TO INCLUDE THE FURNISHING OF ALL LABOR, EQUIPMENT, MATERIALS AND THE PERFORMANCE OF ALL OPERATIONS ASSOCIATED WITH THE INSTALLATION OF THE FIRE ALARM SYSTEM, AS SHOWN ON THE CONTRACT DRAWINGS AND HEREIN SPECIFIED.

2. THE COMPLETE SYSTEM INSTALLATION SHALL BE IN ACCORDANCE WITH THE APPLICABLE SECTIONS OF THE NATIONAL FIRE SAFETY CODE, THE (ADA) AMERICAN DISABILITIES ACT, THE NATIONAL ELECTRICAL CODE, REQUIREMENTS, AND ALL THE REQUIREMENTS OF THE LOCAL FIRE DEPARTMENT.

3. THE REQUIREMENTS OF THE GENERAL CONDITIONS AND THE SUPPLEMENTARY CONDITIONS OF THE CONTRACT DOCUMENTS SHALL APPLY TO ALL WORK SPECIFIED IN THIS SECTION.

4. THE WORK COVERED UNDER THIS SECTION OF THE CONTRACT SPECIFICATIONS SHALL BE COORDINATED WITH ALL OTHER WORK SPECIFIED IN THE OTHER SECTIONS OF THE CONTRACT SPECIFICATIONS.

5. THE FIRE ALARM SYSTEM DESCRIBED HEREIN AND AS SHOWN ON THE PLANS; SHALL BE WIRED, CONNECTED, TESTED AND LEFT IN FIRST CLASS OPERATING CONDITION. THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE PROPER CONTROL EQUIPMENT, CONTROL INTERFACE ANNUNCIATORS, ALARM INITIATING DEVICES, ALARM NOTIFICATION APPLIANCES, WIRING, TERMINATIONS, ELECTRICAL BOXES, AND ALL OTHER NECESSARY MATERIALS FOR A COMPLETE OPERATING SYSTEM.

6. THE FIRE ALARM SYSTEM SHALL BE A MICROPROCESSOR – BASED SYSTEM ALLOWING FOR EDITING OF THE SOFTWARE PROGRAM FOR CHANGES IN SYSTEM OPERATION. THE SYSTEM SHALL BE CAPABLE OF ON–SITE PROGRAMMING TO ACCOMMODATE SYSTEM CHANGES AND/OR SYSTEM EXPANSIONS. ALL SOFTWARE OPERATIONS SHALL BE STORED IN NON–VOLATILE, FLASH PROM MEMORY. LOSS OF THE SYSTEM'S PRIMARY AND/OR SECONDARY POWER SOURCES SHALL NOT RESULT IN A LOSS OF THE SYSTEM SOFTWARE PROGRAMS. FIELD PROGRAMMING SHALL NOT BE LOST IN THE EVENT OF MAIN AND/OR BATTERY POWER LOSS.

7. FULL FLEXIBILITY FOR SELECTIVE INPUT–OUTPUT CONTROL FUNCTIONS BASED ON ANDING, ORING, NOTING, TIMING, AND SPECIAL CODED OPERATIONS SHALL ALSO BE INCORPORATED IN THE RESIDENT SOFTWARE PROGRAM OF THE SYSTEM.

B. SYSTEM OPERATION

1. THE SYSTEM OPERATION SUBSEQUENT TO THE ACTIVATION OF ANY MANUAL OR AUTOMATIC ALARM INITIATING DEVICE SHALL BE AS FOLLOWS:

   A. ALL AUDIBLE VISUAL ALARM INDICATING APPLIANCES SHALL SOUND AT THE NEW FIRE ALARM PANEL AND AT THE REMOTE ANNUNCIATOR UNTIL SILENCED BY THE ALARM SILENCE SWITCH.

   B. THE ALARM SHALL BE DISPLAYED ON AN 80–CHARACTER LCD DISPLAY. THE TOP LINE OF 40 CHARACTERS SHALL BE THE POINT LABEL, AND THE SECOND LINE SHALL BE THE DEVICE TYPE IDENTIFIER. THE SYSTEM ALARM LED SHALL FLASH ON THE CONTROL PANEL UNTIL THE ALARM HAS BEEN ACKNOWLEDGED, ONCE ACKNOWLEDGED, THIS SAME LED SHALL LATCH ON. A SUBSEQUENT ALARM RECEIVED FROM ANOTHER ZONE SHALL FLASH THE SYSTEM ALARM LED ON THE CONTROL PANEL. THE LCD DISPLAY SHALL SHOW THE NEW ALARM INFORMATION, AT THE CONTROL PANEL.

   C. TRANSMIT A SIGNAL FROM THE CONTROL PANEL VIA AN RS232 SERIAL PORT, TO PRINT THE SYSTEM STATUS CHANGES ON THE REMOTE SYSTEM PRINTER.

   D. ACTIVATE THE MUNICIPAL CONNECTION VIA THE RADIO MASTER BOX.

   E. ACTIVATE CONTROL RELAYS LOCATED WITHIN AN EXTERNAL CONTROL CABINET LOCATED NEXT TO THE FIRE ALARM CONTROL PANEL SPECIFIED. IN ADDITION TO BUILDING EVACUATION THE FOLLOWING AUXILIARY CONTROL AND INTERFACE FUNCTIONS SHALL BE PROVIDED BY THE SPECIFIED SYSTEM.

      1. SELECTIVE AUTOMATIC HVAC FAN SHUTDOWN AND MANUAL (HOA) OVERRIDE.
      2. RELEASE OF MAGNETIC DOOR HOLDER.
      3. CAPTURE AN ALTERNATE FLOOR RECALL OF SPECIFIED ELEVATORS.

C. SYSTEM SUPERVISION:

1. THE SYSTEM SHALL BE PROVIDED WITH STYLE 6 (SLC) ADDRESSABLE DEVICE COMMUNICATION CIRCUITS, STYLE D (IDC) INITIATING DEVICE CIRCUITS AND (STYLE Z) NOTIFICATION APPLIANCE CIRCUITS. ALL SYSTEM FAULTS SHALL BE INDICATED AND DISPLAYED AT THE CONTROL PANEL.

2. THE SYSTEM SHALL BE PROVIDED WITH A STANDBY BATTERY SET OR SETS, WITH SUFFICIENT CAPACITY TO OPERATE THE ENTIRE SYSTEM UPON LOSS OF NORMAL OPERATING POWER, FOR A TIME PERIOD OF *RHODE ISLAND*: (60) HOURS IN SUPERVISORY MODE, WITH (15) MINUTES OF ALARM AT THE END OF THE (60) HOUR TIME PERIOD. THE STANDBY BATTERY SET SHALL BE CHARGED, LOAD TESTED AND MONITORED FOR EITHER A DISCONNECTED OR LOW BATTERY STATUS CONDITION BY THE SYSTEM. ANY FAULT DETECTED WITH THE STANDBY BATTERIES SHALL BE INDICATED AND DISPLAYED AT THE CONTROL PANEL.

D. FIRE ALARM CONTROL PANEL

1. CONTROL PANEL SHALL HAVE SOLID STATE, MICROPROCESSOR BASED ELECTRONICS USING SURFACE MOUNT TECHNOLOGY. THROUGH–PUT TECHNOLOGY WILL NOT BE ALLOWED. IT SHALL DISPLAY ONLY THOSE PRIMARY CONTROLS AND DISPLAYS ESSENTIAL TO OPERATION DURING A FIRE ALARM CONDITION. KEYBOARDS OR KEYPADS SHALL NOT BE REQUIRED TO OPERATE THE SYSTEM DURING THE FIRE ALARM CONDITIONS. THE UNIT SHALL HAVE 9 AMP POWER SUPPLY MINIMUM.

2. A LOCAL AUDIBLE DEVICE SHALL SOUND DURING ALARM, TROUBLE OR SUPERVISORY CONDITIONS. THIS AUDIBLE DEVICE SHALL SOUND DIFFERENTLY DURING EACH CONDITION TO DISTINGUISH ONE CONDITION FROM ANOTHER WITHOUT HAVING A VIEW THE PANEL. THIS AUDIBLE DEVICE SHALL ALSO SOUND DURING EACH KEY PRESS TO PROVIDE AN AUDIBLE FEEDBACK TO ENSURE THAT THE KEY HAS BEEN PRESSED PROPERLY.

3. THE FOLLOWING PRIMARY CRYSTAL DISPLAYS:

   A. INDIVIDUAL RED SYSTEM ALARM LED
   B. INDIVIDUAL YELLOW SUPERVISORY SERVICE LED
   C. INDIVIDUAL YELLOW TROUBLE LED
   D. GREEN "POWER ON" LED
   E. ALARM ACKNOWLEDGE KEY
   F. TROUBLE ACKNOWLEDGE KEY
   G. ALARM SILENCE KEY
   H. SYSTEM RESET KEY

4. PRIMARY, KEYS, LED'S AND LCD DISPLAY.

5. THE CONTROL PANEL SHALL HAVE A 2–LINE X 40 CHARACTER LIQUID CRYSTAL DISPLAY WHICH SHALL BE BACK LIGHTED FOR ENHANCED READABILITY. SO AS TO CONSERVE BATTERY STANDBY, POWER IT SHALL NOT BE LIT DURING AN AC POWER FAILURE, UNLESS AN ALARM CONDITION OCCURS OR THERE IS KEYPAD ACTIVITY.

6. THE DISPLAY SHALL SUPPORT BOTH UPPER AND LOWER CASE LETTERS. LOWER CASE LETTERS SHALL BE USED FOR SHORT TITLES AND PROMPTING THE USER. UPPERCASE LETTERS SHALL BE USED FOR SYSTEM STATUS INFORMATION. A CURSOR SHALL BE VISIBLE WHEN ENTERING INFORMATION. SYSTEMS USING UPPERCASE LETTERS ONLY WILL NOT OFFER CLEAR DISTINCTION BETWEEN ALARMS AND PROGRAMMING AND ARE NOT ACCEPTABLE.

7. ANY SUPPLEMENTAL NOTIFICATION CONTROL PANELS SHALL BE CAPABLE OF OPERATING ALL CONNECTED NOTIFICATION APPLIANCE DEVICES THROUGHOUT THE BUILDING, AND 25 % SPARE CAPACITY FOR VISUAL AND THE HORN CIRCUITS. THEY SHALL HAVE AT A MINIMUM 12 AMPS OF AVAILABLE NAC POWER.

E. ISOLATE MODULES

1. PROVIDE FIELD MOUNTED ISOLATE MODULES FOR EVERY 20 DEVICES TO PROTECT CIRCUIT INTEGRITY IN THE EVENT OF A WIRING FAULT & ENSURE STYLE 6 WIRING CONVENTIONS.

F. RESET SYSTEM

1. THE SYSTEM RESET BUTTON SHALL BE USED TO RETURN THE SYSTEM TO ITS NORMAL STATE AFTER AND ALARM CONDITION HAS BEEN REMEDIED. THE LCD DISPLAY SHALL STEP THE USER THROUGH THE RESET PROCESS WITH SIMPLE ENGLISH LANGUAGE MESSAGES. MESSAGE "SYSTEM RESET IN PROGRESS" WILL FIRST BE DISPLAYED, FOLLOWED BY THE MESSAGE "SYSTEM RESET COMPLETED," AND FINALLY "SYSTEM IS NORMAL," SHOULD ALL ALARM CONDITIONS BE CLEARED. IN ORDER TO MAINTAIN CONSISTENCY WITH OTHER EXISTING PANELS, NO DEVIATION FROM THESE MESSAGES CAN BE ACCEPTED.

2. SHOULD AN ALARM CONDITION CONTINUE TO EXIST, THE MESSAGE "SYSTEM RESET IN PROGRESS" WILL BE FOLLOWED BY THE MESSAGE "SYSTEM RESET ABORTED," AND THE SYSTEM WILL REMAIN IN AN ABNORMAL STATE. SYSTEM CONTROL RELAYS SHALL NOT RESET. THE SONALERT AND THE ALARM LED WILL BE ON. THE DISPLAY WILL INDICATE THE TOTAL NUMBER OF ALARMS AND TROUBLES PRESENT IN THE SYSTEM, ALONG WITH A PROMPT TO USE THE ACK KEYS TO REVIEW THE POINTS. THESE POINTS WILL NOT REQUIRE ACKNOWLEDGMENT IF THEY WERE PREVIOUSLY ACKNOWLEDGED.

G. H.O.A. SWITCHTES

1. PROVIDE KEY PAD POSITION SWITCH AS SHOWN ON CONTRACT DRAWINGS.

H. SILENT WALKTEST WITH HISTORY LOGGING

1. THE SYSTEM SHALL BE CAPABLE OF BEING TESTED BY ONE PERSON. WHILE IN THE TESTING MODE, THE ALARM ACTIVATION OF AN INITIATING DEVICE CIRCUIT SHALL BE SILENTLY LOGGED AS AN ALARM CONDITION IN THE HISTORICAL DATA FILE. THE PANEL SHALL AUTOMATICALLY RESET ITSELF AFTER LOGGING OF THE ALARM. THE SYSTEM SHALL SIGNAL THE DEVICE ZONE NUMBER THROUGH THE BUILDING AUDIBLE UNITS, FOR IMMEDIATE VERIFICATION BY THE TEST TECHNICIAN. DUE TO THE CRITICAL NATURE OF THE TEST PROCEDURES, NO DEVIATION FROM THIS SECTION CAN BE ACCEPTED.

I. LED SUPERVISION

1. ALL SLAVE MODULE LEDS SHALL BE SUPERVISED FOR BURNOUT OR DISARRANGEMENT. SHOULD A PROBLEM OCCUR, THE LCD SHALL DISPLAY THE MODULE AND LED LOCATION NUMBERS TO FACILITATE LOCATION OF THE LED. DUE TO THE CRITICAL NATURE OF THE PANEL LCD FUNCTIONS, NO DEVIATION FROM THIS REQUIREMENT CAN BE ACCEPTED.

J. SYSTEM TROUBLE REMINDER

1. SHOULD A TROUBLE CONDITION BE PRESENT WITHIN THE SYSTEM AND THE AUDIBLE TROUBLE SIGNAL SILENCED, THE TROUBLE SIGNAL SHALL RESOUND AT PREPROGRAMMED TIME INTERVALS TO ACT AS REMINDER THAT THE FIRE ALARM SYSTEM IS NOT 100% OPERATIONAL. BOTH THE TIME INTERVAL AND THE TROUBLE REMINDER SIGNALS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE BUILDING CODE AND NFPA 72 AS REFERENCED.

K. MULTIPLE ADDRESSABLE PERIPHERAL NETWORK

1. PROVIDE ADDRESSABLE CIRCUITS FOR COMMUNICATION WITH ADDRESSABLE DEVICES. SYSTEM SHALL HAVE AN INDEPENDENT ISOLATED ADDRESSABLE LOOPS, UP TO 318 ADDRESSABLE DEVICES.

2. THE SYSTEM MUST PROVIDE COMMUNICATION WITH INITIATING AND CONTROL DEVICES INDIVIDUALLY. ALL OF THESE DEVICES WILL BE INDIVIDUALLY ANNUNCIATED AT THE CONTROL PANEL.

3. ANNUNCIATION SHALL INCLUDE THE FOLLOWING CONDITIONS FOR EACH POINT.

   A. ALARM
   B. TROUBLE
   C. OPEN
   D. SHORT
   E. DEVICE MISSING/FAILED

4. ALL ADDRESSABLE DEVICES SHALL HAVE THE CAPABILITY OF BEING DISABLED OR ENABLED INDIVIDUALLY.

5. UP TO 318 ADDRESSABLE DEVICES ON A CLASS A CIRCUIT. SYSTEMS THAT REQUIRE FACTORY RE–PROGRAMMING TO ADD OR DELETE SERVICES ARE UNACCEPTABLE.

6. IDENTIFICATION OF ADDRESSABLE DEVICES.

L. PHOTOELECTRIC DETECTOR HEAD

1. PROVIDE PHOTOELECTRIC TYPE DETECTORS. WHERE INDICATED OR REQUIRED. THEY SHALL BE A PLUG–IN UNIT WHICH MOUNTS TO A TWISTLOCK BASE, AND SHALL BE UL APPROVED.

2. THE DETECTORS SHALL BE OF THE SOLID STATE PHOTOELECTRIC TYPE AND SHALL CONTAIN NO RADIOACTIVE MATERIAL. THEY WILL USE A REFRACTED INFRARED LED LIGHT SOURCE AND BE SEALED AGAINST REAR AIR FLOW ENTRY.

3. THE DETECTOR SHALL FIT INTO A BASE THAT IS COMMON WITH BOTH THE HEAT DETECTOR AND IONIZATION TYPE DETECTOR AND SHALL BE COMPATIBLE WITH OTHER ADDRESSABLE DETECTORS, ADDRESSABLE MANUAL STATIONS, AND ADDRESSABLE ZONE ADAPTER MODULES ON THE SAME CIRCUIT. DEVICE ADDRESSES SHALL BE CONTAINED IN THE BASE OF THE DETECTOR. THOSE SYSTEMS WHICH PROVIDE ADDRESSING IN THE HEAD, SHALL PROVIDE AN ADDRESSABLE MONITOR MODULE AND A CONVENTIONAL DETECTOR ASSEMBLY TO ALLOW THE OWNER TO REPLACE A DETECTOR HEAD WITHOUT THE NEED OF VERIFYING DETECTOR ADDRESS.

4. THERE SHALL BE NO LIMIT TO THE NUMBER OF DETECTORS OR ZONE ADAPTER MODULES WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.

5. DUE TO THE REQUIREMENT FOR IMMEDIATE CHANGE OUT OF DETECTOR HEADS ADDRESS SETTING SWITCHES, JUMPERS ETC., MAY BE PROVIDED IN THE HEAD OR BEHIND THE DETECTOR BASE. DETECTORS WHICH USE DIP SWITCHES ARE NOT ACCEPTABLE.

6. PROVIDE A DUCT HOUSING WITH SENSOR, WITH RELAY. THE RELAY SHALL BE SOFTWARE PROGRAMMABLE TO ALLOW THE UNIT IN WHICH THE DETECTOR IS MOUNTED IN TO BE SHUT DOWN, OR ANY OTHER DEVICE TO BE CONTROLLED BY THIS PROGRAMMABLE RELAY. THE RELAY MAY BE A SEPARATE UNIT FROM THE DUCT HOUSING TO ALLOW FOR TROUBLESHOOTING AND DISCONNECTS.

7. PROVIDE SAMPLING TUBE AS REQUIRED FOR UNIT SIZE.

8. PROVIDE A REMOTE TEST UNIT FOR EACH DUCT SMOKE DETECTOR WITH LED ALARM INDICATOR AND TEST KEY SWITCH.

M. LCD ANNUNCIATOR

1. PROVIDE A VGA COLOR TOUCH SCREEN LCD ANNUNCIATOR AND STATIC GRAPHIC PLOT PLAN AS SHOWN ON THE CONTRACT DRAWINGS. SUBMIT A LAYOUT OF THIS UNIT TO THE ENGINEER FOR APPROVAL.

2. PROVIDE CITY CONNECTIONS TO THE LOCAL FIRE DEPARTMENT.

N. ADDRESSABLE THERMAL DETECTOR HEAD

1. PROVIDE THERMAL DETECTOR HEADS WHERE INDICATED OR REQUIRED.

2. THERMAL DETECTOR HEADS MUST BE UL LISTED. SHALL BE A COMBINATION RATE–OF–USE AND FIXED TEMPERATURE (135 F) TYPE, AUTOMATICALLY RESTORABLE.

3. PROVIDE REMOTE LED ALARM INDICATORS, AS INDICATED ON PLANS.

O. ADDRESSABLE PULL STATIONS

1. PROVIDE ADDRESSABLE PULL STATIONS WHICH CONTAIN ELECTRONICS THAT COMMUNICATE THE STATION'S STATUS (ALARM, NORMAL) TO THE CONTROL PANEL OVER ONE TWISTED PAIR. THE ADDRESS WILL SET ON THE STATION. THEY WILL BE MANUFACTURED FROM HIGH IMPACT RED LEXAN. STATION WILL MECHANICALLY LATCH UPON OPERATION AND REMAIN SO UNTIL MANUALLY RESET BY OPENING WITH A KEY COMMON TO ALL SYSTEM LOCKS. PULL STATIONS WILL BE DOUBLE ACTION AND AS IDENTIFIED BY A SCHEDULE ON THE PRINTS.

2. THE FRONT OF THE STATION IS TO BE HINGED TO A BACKPLATE ASSEMBLY AND MUST BE OPENED WITH A KEY TO RESET THE STATION. THE KEY SHALL BE COMMON WITH THE CONTROL PANELS. STATIONS WHICH USE ALLEN WRENCHES OR SPECIAL TOOLS TO RESET WILL NOT BE ACCEPTED. THE STATION SHALL CONSIST OF HIGH IMPACT LEXAN PLASTIC, RED IN COLOR.

3. THE ADDRESSABLE MANUAL STATION SHALL BE CAPABLE OF FIELD PROGRAMMING OF ITS "ADDRESSABLE" LOCATION ON AN ADDRESSABLE INITIATING CIRCUIT.

4. THERE SHALL BE NO LIMIT TO THE NUMBER OF STATIONS, DETECTORS OR ZONE ADAPTER MODULES, WHICH MAY BE ACTIVATED OR "IN ALARM" SIMULTANEOUSLY.

5. THE ADDRESSABLE MANUAL STATION SHALL BE UNDERWRITER'S LABORATORIES INC. LISTED.

6. PROVIDE PROTECTIVE COVERS, EQUAL TO STOPPER II, WHERE REQUIRED BY THE AHJ.

P. ZONE ADAPTER MODULES

1. ZONE ADAPTER MODULES SHALL BE USED FOR MONITORING OF WATERFLOW, VALVE TAMPER, HALON CONTROL PANELS, NON–ADDRESSABLE DETECTORS, AND FOR CONTROL OF EVACUATION INDICATING APPLIANCES AND AHU SYSTEMS.

2. AN ADDRESSABLE INTERFACE MODULE SHALL BE PROVIDED FOR INTERFACING NORMALLY OPEN DIRECT CONTACT DEVICES TO AN ADDRESSABLE INITIATING CIRCUIT.

3. ADDRESSABLE MODULES WILL BE CAPABLE OF MOUNTING IN A STANDARD ELECTRIC OUTLET BOX. ZAMS WILL INCLUDE COVER PLATES TO ALLOW SURFACE OR FLUSH MOUNTING. ZAMS WILL RECEIVE THEIR 24 VDC POWER FROM A SEPARATE TWO WIRE PAIR RUNNING FROM AN APPROPRIATE POWER.

4. THERE SHALL BE TWO TYPES OF DEVICES:
   TYPE 1: MONITOR MODULE
   TYPE 2: CONTROL MODULE

5. ADDRESSABLE DEVICE SUPERVISION.

   A. ALL DEVICES SHALL BE SUPERVISED FOR TROUBLE CONDITION. THE SYSTEM CONTROL PANEL WILL BE CAPABLE OF DISPLAYING THE TYPE OF TROUBLE CONDITION (OPEN, SHORT, DEVICE MISSING/FAILED). SHOULD A DEVICE FAIL, IT WILL NOT HINDER THE OPERATION OF OTHER DEVICES.

6. SPRINKLER FLOW, AND TAMPER SWITCHES ARE TO BE SUPPLIED AND INSTALLED BY THE SPRINKLER CONTRACTOR AND WIRED BY THE ELECTRICAL CONTRACTOR AS REQUIRED BY THE LOCAL FIRE DEPARTMENT. EACH DEVICE SHALL BE AN ADDRESS ON THE FIRE ALARM PANEL, SO THAT THEY MAY BE PROGRAMMED AS EITHER ALARMS OR TROUBLES. PROGRAM ALL AS ALARMS ON THIS PROJECT.

Q. AUDIBLE/VISUAL UNIT (XENON STROBE)

1. PROVIDE MULTI–CANDELA HORN/STROBE UNITS COMPRISED OF A HORN AND XENON FLASH TUBE ENTIRELY SOLID STATE. THE UNIT TO CONFORM TO ITS REQUIREMENTS.

2. VISUAL FLASHING LAMPS (XENON STROBE)

3. VISUAL INDICATING APPLIANCES SHALL BE COMPRISED OF A XENON FLASH TUBE AND BE ENTIRELY SOLID STATE. THIS UNIT SHALL MOUNT TO A SINGLE GANG BOX AND PLATE FOR SURFACE MOUNT. MINIMUM OF 75 CD LIGHT OUTPUT TO CONFORM TO A.D.A. ALL STROBES SHALL BE SYNCHRONIZED.

R. MINI–HORNS

1. WHITE W/RED LETTERING MINI HORN WHERE INDICATED ON CONTRACT DRAWINGS.THE UNIT SHALL MOUNT TO A SINGL E, DEEP GANG BOX.

S. STROBE LIGHT

1. PROVIDE A MULTI–CANDELA STROBE APPLIANCE.

T. MAGNETIC DOOR HOLDERS

1. PROVIDE SEMI–FLUSH WALL MOUNTED, 120 V.A.C AND 24 V.D.C. WITH LONG CATCH PLATE.

U. BATTERIES AND BATTERY CABINET

1. PROVIDE MAINTENANCE – FREE BATTERIES.

V. RELAY MODULE

1. PROVIDE ADDRESSABLE RELAY TO PROVIDE SUPERVISED CONTROL OF AUXILIARY CIRCUITS (AHU's, DOOR HOLDER's, ETC) VIA SLC ADDRESSABLE LOOP. RELAY SHALL PROVIDE SUPERVISED OUTLET FOR 3AMPS @ 30VDC OR 0.5AMPS AT 120VAC. WHERE CURRENT EXCEEDS LIMITATIONS PROVIDE ISOLATION RELAY RATED FOR REQUIRED LOAD.

W. INSTALLATION FIRE ALARM WIRING

1. ALL FIRE ALARM WIRING SHALL CONFORM TO THE APPLICABLE STATE AND LOCAL FIRE SAFETY CODES.

2. WIRING SHOWN ON DRAWINGS IS FOR ESTIMATING PURPOSED ONLY. THE FINAL WIRING REQUIREMENTS SHALL BE PER THE EQUIPMENT MANUFACTURER'S WIRING DIAGRAMS AND NO INCREASE IN CONTRACT PRICE WILL BE ALLOWED FOR ANY ADDITIONAL WIRES THAT MAY BE SHOWN ON THE MANUFACTURER'S DRAWINGS.

3. DETAILED ONE–LINE SCHEMATIC WIRING DIAGRAMS OF EACH SPECIFIED DEVICE BETWEEN ALL SYSTEMS. THESE CONNECTION DRAWINGS ARE TO INDICATE ROUTING OF CONDUCTORS VIA THE FLOOR TERMINAL BOXES.

X. SHUTDOWNS OF ANY EXISTING SYSTEMS

1. THIS CONTRACTOR SHALL COORDINATE ALL REQUIRED SHUTDOWNS OF THE EXISTING FIRE ALARM SYSTEM DURING THE DURATION OF THIS CONTRACT. ALL SYSTEM SHALL BE COORDINATED WITH THE OWNER AND THE FIRE DEPARTMENT. THE FIRE ALARM SYSTEMS SHALL BE RETURNED TO A NORMAL MODE OF OPERATION BY THE END OF EACH WORKDAY. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL COSTS INCURRED FOR A FIRE WATCH IF THE SYSTEM IS NOT OPERATIONAL AT THE END OF A WORKDAY.

Y. PROGRAMMING OF SYSTEM

1. THIS CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN APPROVED ZONE AND DEVICE CUSTOM LABELS, THAT WILL BE PROGRAMMED INTO THE SYSTEM FOR ZONE AND DEVICE IDENTIFICATION PURPOSES. THE SUBJECT CUSTOM LABELS SHALL BE APPROVED BY OWNERS REPRESENTATIVE AND THE FIRE DEPT. BEFORE THEY ARE PROGRAMMED INTO THE SYSTEM.

Z. TRAINING:

1. THE ELECTRICAL CONTRACTOR AND SYSTEM MANUFACTURER SHALL PROVIDE A MINIMUM OF ONE (1) ON–SITE TRAINING SESSIONS FOR THE OWNER'S REPRESENTATIVES. EACH SESSION SHALL BE A MINIMUM OF 1 HOUR.

2. DUE TO THE CRITICAL NATURE OF PROPER SYSTEM OPERATION, TRAINING MUST BE CONDUCTED BY PERSONNEL IN THE DIRECT EMPLOY OF THE MANUFACTURER OF THE FIRE ALARM CONTROL PANEL. A THIRD PARTY INSTRUCTOR IS NOT ACCEPTABLE.

AA. WARRANTY:

1. THE CONTRACTOR SHALL WARRANT THE COMPLETE FIRE ALARM SYSTEM WIRING AND EQUIPMENT TO BE FREE FROM INHERENT MECHANICAL AND ELECTRICAL DEFECTS FOR A PERIOD OF (3) THREE YEARS FROM THE DATE OF THE COMPLETED AND CERTIFIED TEST OR FROM THE DATE OF FIRST BENEFICIAL USE.

2. THE EQUIPMENT MANUFACTURE SHALL MAKE AVAILABLE TO THE OWNER A MAINTENANCE CONTRACT PROPOSAL TO PROVIDE A MINIMUM OF TWO (2) INSPECTIONS AND TEST PER YEAR IN COMPLIANCE WITH NFPA–72H GUIDELINES.

BB. SUBMITTALS

1. PROVIDE COMPLETE SETS OF DOCUMENTATION TO INCLUDE THE FOLLOWING:

   A. A COMPLETE POINT TO POINT RISER DIAGRAM OF THE FIRE ALARM SYSTEM SHOWING ALL DEVICES AND EQUIPMENT AND SIZE, TYPE AND NUMBERS OF ALL CONDUCTORS.

   B. BATTERY STANDBY AND POWER SUPPLY CALCULATIONS SHOWING TOTAL POWER REQUIRED TO MEET THE SPECIFIED SYSTEM REQUIREMENTS INCLUDING SPARE CAPACITY ALLOWANCES. CALCULATIONS SHALL INCLUDE A COMPLETE LIST OF CURRENT REQUIREMENTS DURING NORMAL, SUPERVISORY, TROUBLE AND ALARM CONDITIONS. CALCULATIONS SHALL ALSO DEMONSTRATE PROPER CONSIDERATION OF CURRENT REQUIREMENTS, WIRE SIZE, WIRE LENGTH AND VOLTAGE DROP CHARACTERISTICS.

   C. MANUFACTURER'S ORIGINAL CATALOG DATA SHEETS SHALL BE SUPPLIED FOR ALL OF THE EQUIPMENT TO BE SUPPLIED. ALL EQUIPMENT SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER AND NO EQUIPMENT SHALL BE ORDERED WITHOUT PRIOR APPROVAL.

   D. LARGE SCALE DRAWINGS OF THE MAIN CONTROL PANEL AND EACH REMOTE PANEL DEPICTING OVERALL MECHANICAL DIMENSIONS, LAYOUT INCLUDING FUTURE ALLOWANCES, AND FIELD WIRING IN FULL DETAIL.

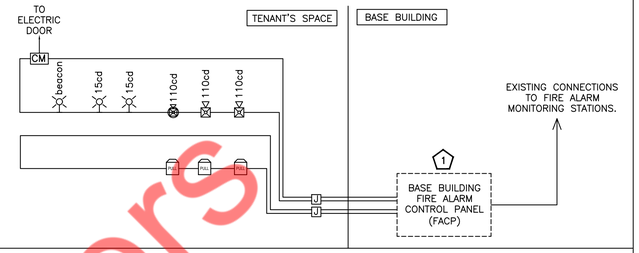
   E. DOCUMENTATION OF THE SUPPLIER'S QUALIFICATIONS INDICATING YEARS IN BUSINESS SERVICE POLICIES, WARRANTY DEFINITIONS, AND A LIST OF SIMILAR INSTALLATIONS IN THE LOCAL MUNICIPALITY.

   F. PROVIDE A COMPLETE DETAILED DESCRIPTION OF THE SYSTEM OPERATION.

   G. ADDRESSES FOR ALL FIELD DEVICES SHALL BE SHOWN ON FLOOR PLANS SUPPLIED WITH THIS SUBMITTAL.

CC. DOCUMENTATION:

1. AT THE COMPLETION OF THE PROJECT A COMPLETE SET OF OPERATING/MAINTENANCE MANUALS, THE FIRE ALARM SUBMITTAL BOOK, POINT–TO–POINT WIRING DIAGRAMS, A TERMINAL STRIP CABINET CONNECTION POINT DIAGRAM FOR EACH TERMINAL CABINET, A COMPLETE POINT ADDRESS LISTING BY DEVICE, AND A FINAL TEST REPORT SHALL BE GIVEN TO THE OWNER.



BUILDING FIRE ALARM RISER:

FIRE ALARM KEYED NOTES: #

1. EXISTING FIRE ALARM CONTROL PANEL IN BASE BUILDING. CO–ORDINATE EXACT LOCATION OF FACP IN FIELD.

FIRE ALARM GENERAL NOTES:

1. THE FIRE ALARM SYSTEM SHALL CONFIRM WITH THE MASSACHUSETTS FIRE SAFETY CODE AND LOCAL FIRE DEPARTMENT. SHOP DRAWINGS SHALL BE SUBMITTED TO FIRE DEPARTMENT FOR APPROVAL.
2. ALL FIRE WORK SHALL BE ACCORDANCE WITH THE LATEST EDITION OF NFPA, STATE AND LOCAL BUIDING CODES AND AMERICANS WITH DISABILITIES ACT (ADA).
3. REFER TO FLOOR PLAN FOR EXACT QUANTITIES AND LOCATION OF ALL DEVICES.
4. ALL NEW FIRE ALARM DEVICES IN TENANT SPACE SHALL BE COMPATIBLE WITH THE BASE BUILDING FACP.
5. PROVIDE FAUL ISOLATION MODULES ON THE SIGNAL LINE CIRCUIT TO PROTECT THE SYSTEM FROM LINE TO LINE FAULTS. MODULES SHALL BE PROVIDED AS REQUIRED, WITH MINIMUM OF (1) MODULE PER EVERY 25 DEVICES.

FIRE ALARM SYSTEM LEGEND:

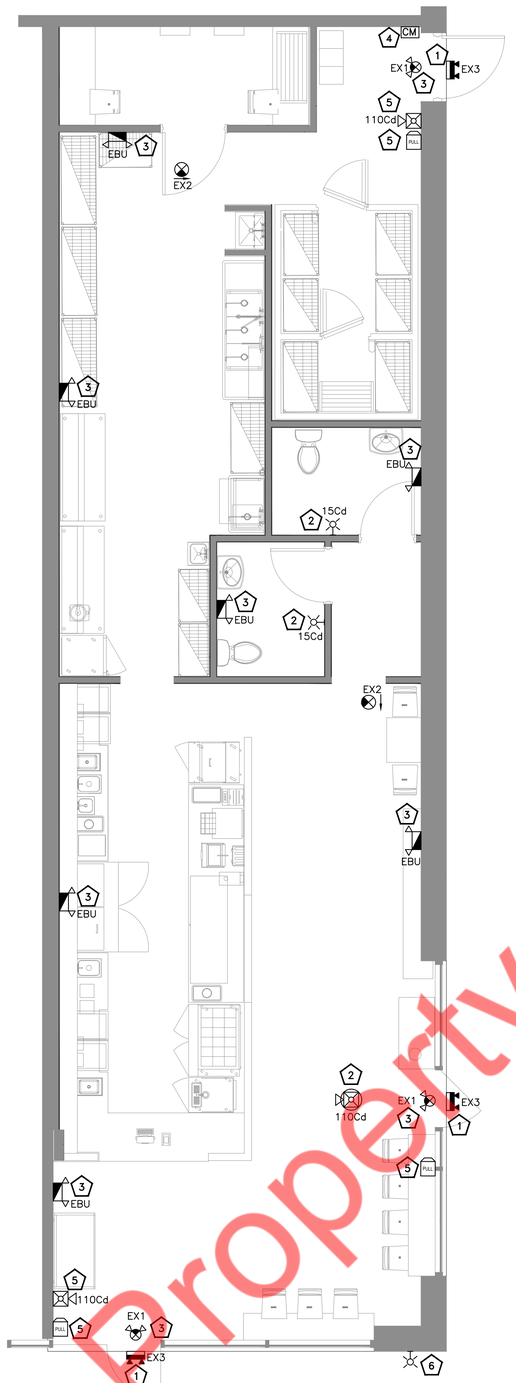
	MANUAL PULL STATION MOUNTED 48" AFF
(SD)	EXISTING SMOKE DETECTOR/SENSOR
(D)	DUCT SMOKE DETECTOR/SENSOR
(SD)	EXISTING SMOKE DETECTOR/SENSOR
(HD)	HEAT DETECTOR/SENSOR
	VISIBLE ONLY(STROBE) – WALL MOUNT CD– CANDELA RATING/SETTING
CM	CONTROL MODULE
RAI	REMOTE ALARM INDICATOR
RTS	REMOTE TEST STATION FOR DUCT SMOKE DETECTOR WITH NAMEPLATE
FACP	FIRE ALARM CONROL PANEL
FAAP	FIRE ALARM ANNUNCIATOR PANEL
	COMBINATION HORN/VISIBLE CD– CANDELA RATING/SETTING WALL MOUNTED.
	COMBINATION HORN/VISIBLE CD– CANDELA RATING/SETTING–CEILING MOUNTED.

EMERGENCY/EXIT LIGHTING LEGEND:

EX1	EXIT COMBO	EXITRONICS CLED–1–WH–G2	–
EX2	EXIT	EXITRONICS VEX–U–BP–LB–WH	–
EBU	EMERGENCY BATTERY UNIT	EXITRONIX NFT–HO–W–G2	–
EX3	EXTERIOR EMERGENCY	EXITRONIX NFT–HO–W–G2 OR EQUIVALENT	WEATHER PROOF

I/O MATRIX:

	SYSTEM OUTPUTS / INDICATING/CONTROLLED DEVICES / SYSTEM INPUTS INITIATING DEVICES	CONTROL UNIT ANNUNCIATION				NOTIFICATION				REQUIRED FIRE SAFETY CONTROL	
		ACTIVATE COMMON ALARM SIGNAL INDICATOR ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS.	SOUND INTERNAL BUZZER AT FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS.	TEXT MESSAGE DISPLAY DEVICE TYPE & LOCATION OF THE ACTIVATING DEVICES ON LCD OF FIRE ALARM CONTROL PANEL & OUTLYING ANNUNCIATORS.	ACTIVATE EVACUATION SIGNAL THROUGH HORNS AND FLASH THE STROBES THROUGHOUT FLOORS.	TRANSMIT "MANUAL" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY.	TRANSMIT "SMOKE" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY.	TRANSMIT "TROUBLE" ALARM SIGNAL TO FIRE DEPARTMENT VIA AN APPROVED CENTRAL STATION MONITORING COMPANY.	RELEASE ALL ELECTRICALLY HELD OPEN FIRE & SMOKE DOORS.	
		A	B	C	D	E	F	G	H	I	
1	MANUAL PULL STATION	●		●	●	●	●			●	
2	FIRE ALARM AC POWER FAILURE		●	●	●				●		
3	FIRE ALARM SYSTEM LOW BATTERY		●	●	●				●		
4	OPEN CIRCUIT		●	●	●				●		
5	GROUND CIRCUIT		●	●	●



1 ELECTRICAL FIRE ALARM PLAN
1/4" = 1'-0"

FIRE ALARM GENERAL NOTES:

- ALL NEW FIRE ALARM DEVICES IN TENANT SPACE SHALL BE COMPATIBLE/SYNCHRONISED WITH BASE BUILDING FACP.
- VERIFY OPERABLE CONDITIONS OF EXISTING FIRE ALARM DEVICES, RERPLACE IF INOPERABLE. BASE BID ACCORDINGLY.
- GENERAL CONTRACTOR SHALL VERIFY LOCATION AND OPERABLE CONDITION OF EXISTING DEVICES IN FIELD PRIOR TO BID. INFORM ENGINEER ON RECORD IN CASE OF ANY DISCREPANCIES.

FIRE ALARM KEYED WORK NOTES: (#)

1. WEATHERPROOF EMERGENCY EGRESS LIGHT FIXTURE. CONNECT TO NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES.
2. NEW FIRE ALARM DEVICE SHALL BE CONNECTED TO THE BASE BUILDING FIRE ALARM CONTROL PANEL. COORDINATE WITH BASE BUILDING/OWNER FOR EXACT LOCATION OF EXISTING FIRE ALARM CONTROL PANEL (FACP).
3. CONNECT ALL EMERGENCY, EGRESS AND EXIT SIGN TO NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES.
4. CONTROL MODULE FOR INTEGRATING ELECTRIC FAILSAFE DOOR WITH FIRE ALARM PANEL.
5. EXISTING FIRE ALARM DEVICE SHALL REMAIN CONNECTED TO THE EXISTING BASE BUILDING FIRE ALARM CONTROL PANEL. E.C. SHALL VERIFY OPERABLE CONDITION OF DEVICE IN FIELD. REPLACE IF INOPERABLE. BASE BID ACCORDINGLY.
6. EXISTING BEACON LIGHT ALONG WITH ITS OTHER CONNECTIONS TO REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION OF DEVICE IN FIELD. REPLACE IF INOPERABLE. BASE BID ACCORDINGLY.

ENGINEER:

CLIENT:

LIV'S JUICE BAR, LLC

PROJECT:

LIVS JUICE - WOBURN

REVISIONS

NO.	DATE	DESCRIPTION

SEAL:

ISSUED FOR: PERMIT

ISSUED DATE: 08.12.22

DRAWN BY: NYE

CHECKED BY: NYE

PROJECT NUMBER: 2209

DRAWING NAME:

ELECTRICAL FIRE ALARM PLAN

DRAWING NO.

FA002