MECHANICAL SYMBOLS LIST

AC–1 / TXF–1	EQUIPMENT SYMBOL
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN
DUCT ACCESSORIES	
VD	VOLUME DAMPER W/ ACCESS DOOR
	FIRE DAMPER W/ ACCESS DOOR
M	MOTORIZED DAMPER W/ ACCESS DOOR
BD	BACKDRAFT DAMPER
HVAC PIPING	
CP	NEW CONDENSATE PIPING
CONTROLS AND SENSORS	
T	THERMOSTAT
T_S	TEMPERATURE SENSOR
H	HUMIDISTAT
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

AC	AIR CONDITIONING UNIT
CU	CONDENSING UNIT
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
CFM	CUBIC FEET OF AIR PER MINUTE
CP	CONDENSATE PUMP
CD	CONDENSATE DRAIN PIPE
DN	DOWN
FC	FLEXIBLE CONNECTION
VD	VOLUME DAMPER
BCC	BRANCH CIRCUIT CONTROLER
OAF	OUTSIDE AIR FAN
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
REF	REFRIGERANT PIPE
KEF	KITCHEN EXHAUST FAN
CDS	CEILING SUPPLY DIFFUSER
BEF	BATHROOM EXHUAST FAN

MECHANICAL DRAWING LIST

APPLICABLE CODES

a. 2022 NYC BUILDING CODE.

b. 2022 NYC MECHANICAL CODE.

c. 2022 NYC PLUMBING CODE.

d. 2011 NYC ELECTRICAL CODE. (NEC).

e. 2022 NYC FUEL GAS CODE.

f. 2020 NYC ENERGY CONSERVATION CODE

g. 2016 NFPA 13.

NEW YORK BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE CITY OF NEW YORK BUILDING CODE, EFFECTIVE NOVEMBER 7, 2022 AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
2. 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 2022 BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION [BC 1704].
3. 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.
4. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION MC 107 AND THE FOLLOWING SECTIONS OF THE 2022 NEW YORK CITY MECHANICAL CODE:
   A. VENTILATION SYSTEM BALANCING MC 403.3.3.1.6
   B. NYC NOISE CONTROL CODE: 24–227
   C. REFRIGERATION SYSTEMS – MC 1108
   D. GREASE DUCT TEST: MC 506.3.2.5
5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING – MC 309.1
   B. NYC NOISE CONTROL CODE: 24–227
   C. DUCT CONSTRUCTION AND INSTALLATION– MC 603
   D. AIR INTAKES, EXHAUSTS AND RELIEFS – MC 401.5
   E. AIR FILTERS – MC 605
   F. SMOKE DETECTORS AND FIRE AND SMOKE DAMPERS – MC 606 & 607 RESPECTIVELY
6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
7. VENTILATION FOR ALL AREA SHALL COMPLY WITH MC 401.
8. 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 MC 403.3
9. ALL FIRE DAMPERS SHALL BE ACCEPTED FOR USE BY THE NEW YORK CITY DEPARTMENT OF BUILDINGS. FIRE DAMPERS SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555, STANDARDS FOR FIRE DAMPERS AND CEILING DAMPERS.
10. COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS SHALL BE ACCEPTED FOR USE BY NEW YORK CITY DEPARTMENT OF BUILDINGS AND SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555S.
11. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION MC 606 TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.
12. FIRE DAMPERS, COMBINATION FIRE/SMOKE DAMPERS LOCATED WITHIN THE AIR DISTRIBUTION AND SMOKE CONTROL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION MC 607.
13. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE–RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
14. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
15. SMOKE DETECTOR SHALL MEET UL268A.
16. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
17. CERTIFICATE OF COMPLIANCE SHALL BE OBTAINED FOR EQUIPMENT PER BC110.6.
18. 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.

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.

ENERGY CONSERVATION CODE OF NEW YORK CITY COMPLIANCE

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CODE OF NEW YORK CITY 2020

RCNY 5000 - TABLE 2 - COMMERCIAL BUILDINGS

YES	NO	IIB II	MECHANICAL AND SERVICE WATER HEATING INSPECTIONS INSPECTION/TEST	FREQUENCY/MINIMUM	REFERENCE STANDARD (SEE ECC CHAPTER 6) OR OTHER CRITERIA	ECC OR OTHER CITATION
	X	IIB1	**FIREPLACES:** PROVISION OF COMBUSTION AIR AND TIGHT-FITTING FIREPLACE DOORS MUST BE VERIFIED BY VISUAL INSPECTION.	PRIOR TO FINAL CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS; UL 127	C402.2.8; BC 2111; MC CHAPTERS 7, 8, 9; FGC CHAPTER 6
X		IIB2	**SHUTOFF DAMPERS:** DAMPERS FOR STAIR AND ELEVATOR SHAFT VENTS AND OTHER OUTDOOR AIR INTAKES AND EXHAUST OPENINGS INTEGRAL TO THE BUILDING ENVELOPE MUST BE VISUALLY INSPECTED TO VERIFY THAT SUCH DAMPERS, EXCEPT WHERE PERMITTED TO BE GRAVITY DAMPERS, COMPLY WITH APPROVED CONSTRUCTION DRAWINGS. MANUFACTURER'S LITERATURE MUST BE REVIEWED TO VERIFY THAT THE PRODUCT HAS BEEN TESTED AND FOUND TO MEET THE STANDARD.	AS REQUIRED DURING INSTALLATION	APPROVED CONSTRUCTION DOCUMENTS; AMCA 500D	C402.5.5, C403.7.7; ASHRAE 90.1 – 6.4.3.4
X		IIB3	**HVAC-R EQUIPMENT:** EQUIPMENT SIZING, EFFICIENCIES AND OTHER PERFORMANCE FACTORS OF ALL MAJOR EQUIPMENT UNITS, AS DETERMINED BY THE APPLICANT OF RECORD, AND NO LESS THAN 15% OF MINOR EQUIPMENT UNITS, SHALL BE VERIFIED BY VISUAL INSPECTION AND, WHERE NECESSARY, REVIEW OF MANUFACTURER'S DATA. POOL HEATERS AND COVERS SHALL BE VERIFIED BY VISUAL INSPECTION.	PRIOR TO FINAL PLUMBING AND CONSTRUCTION INSPECTION	APPROVED CONSTRUCTION DOCUMENTS	C403.1, C403.2, C403.3, C403.7.5, C404.9, C404.10, C406; ASHRAE 90.1 – 6.3, 6.4, 6.5, 6.7, 7.4, 7.5, 7.8, 10.4.6, APPENDIX I
X		IIB4	**HVAC-R SYSTEM CONTROLS:** NO LESS THAN 20% OF EACH TYPE OF REQUIRED CONTROLS MUST BE VERIFIED BY VISUAL INSPECTION AND TESTED FOR FUNCTIONALITY AND PROPER OPERATION. SUCH CONTROLS MUST INCLUDE, BUT ARE NOT LIMITED TO: • THERMOSTATIC • OFF-HOUR • ZONES • FREEZE PROTECTION/SNOW- AND ICE-MELT SYSTEM • VENTILATION SYSTEM AND FAN CONTROLS • ENERGY RECOVERY SYSTEMS • KITCHEN/LAB EXHAUST SYSTEMS • FAN SYSTEMS SERVING SINGLE AND MULTIPLE ZONES • OUTDOOR HEATING SYSTEMS • HVAC CONTROL IN HOTEL/MOTEL GUEST ROOMS • AIR/WATER ECONOMIZERS & CONTROLS • HYDRONIC SYSTEMS • HEAT REJECTION SYSTEMS • HOT GAS BYPASS LIMITATION • REFRIGERATION SYSTEMS • DOOR SWITCHES • COMPUTER ROOM SYSTEMS • SERVICE WATER HEATING SYSTEMS • POOL HEATER AND TIME SWITCHES **CONTROLS WITH SEASONALLY DEPENDENT FUNCTIONALITY:** CONTROLS WHOSE COMPLETE OPERATION CANNOT BE DEMONSTRATED DUE TO PREVAILING WEATHER CONDITIONS TYPICAL OF THE SEASON DURING WHICH PROGRESS INSPECTIONS WILL BE PERFORMED SHALL BE PERMITTED TO BE SIGNED OFF FOR THE PURPOSE OF A TEMPORARY	AFTER INSTALLATION AND PRIOR TO FINAL ELECTRICAL AND CONSTRUCTION INSPECTION, EXCEPT THAT FOR CONTROLS WITH SEASONALLY DEPENDENT FUNCTIONALITY, SUCH TESTING MUST BE PERFORMED BEFORE SIGNOFF FOR ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING CONTROL SYSTEM NARRATIVES; ASHRAE GUIDELINE 1: THE HVAC COMMISSIONING PROCESS WHERE APPLICABLE	C403, C404, C406, ASHRAE 90.1 – 6.3, 6.4, 6.5, 6.6, 7.4, 7.5, APPENDIX I
X		IIB5	**HVAC-R DESIGN AND INSULATION:** INSTALLED PIPING INSULATION MUST BE VISUALLY INSPECTED TO VERIFY PROPER INSULATION PLACEMENT AND VALUES. SERVICE HOT WATER DISTRIBUTION SYSTEMS MUST BE INSPECTED TO VERIFY THE SUPPLY OF HEATED WATER.	AFTER INSTALLATION AND PRIOR TO CLOSING SHAFTS, CEILINGS AND WALLS	APPROVED CONSTRUCTION DOCUMENTS; SMACNA DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE	C403.11, C404.4, C404.5; MC 603.9; ASHRAE 90.1 – 6.3, 6.4.4, 6.8.2, 6.8.3; 7.4.3
	X	IIB6	**DUCT LEAKAGE TESTING, INSULATION AND DESIGN:** FOR DUCT SYSTEMS DESIGNED TO OPERATE AT STATIC PRESSURES IN EXCESS OF 3 INCHES W.G. (747 PA), REPRESENTATIVE SECTIONS, AS DETERMINED BY THE PROGRESS INSPECTOR, TOTALING AT LEAST 25% OF THE DUCT AREA, MUST BE TESTED TO VERIFY THAT ACTUAL AIR LEAKAGE IS BELOW ALLOWABLE AMOUNTS. INSTALLED DUCT INSULATION MUST BE VISUALLY INSPECTED TO VERIFY PROPER INSULATION PLACEMENT AND VALUES. JOINTS, LONGITUDINAL AND TRANSVERSE SEAMS AND CONNECTIONS IN DUCTWORK MUST BE VISUALLY INSPECTED FOR PROPER SEALING.	AFTER INSTALLATION AND SEALING AND PRIOR TO CLOSING SHAFTS, CEILINGS AND WALLS	APPROVED CONSTRUCTION DOCUMENTS; SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL; SMACNA DUCT CONSTRUCTION STANDARDS, METAL AND FLEXIBLE	C403.11; ASHRAE 90.1 – 6.4.4.2.2
		IID	**OTHER**			
X		IID1	**MAINTENANCE INFORMATION:** MAINTENANCE MANUALS FOR MECHANICAL, SERVICE HOT WATER AND ELECTRICAL EQUIPMENT AND SYSTEMS REQUIRING PREVENTIVE MAINTENANCE MUST BE REVIEWED FOR APPLICABILITY TO INSTALLED EQUIPMENT AND SYSTEMS BEFORE SUCH MANUALS ARE PROVIDED TO THE OWNER. LABELS REQUIRED FOR SUCH EQUIPMENT OR SYSTEMS MUSTL BE INSPECTED FOR ACCURACY AND COMPLETENESS.	PRIOR TO SIGN-OFF OR ISSUANCE OF FINAL CERTIFICATE OF OCCUPANCY	APPROVED CONSTRUCTION DOCUMENTS, INCLUDING ELECTRICAL DRAWINGS WHERE APPLICABLE; ASHRAE GUIDELINE 4: PREPARATION OF OPERATING AND MAINTENANCE DOCUMENTATION FOR BUILDING SYSTEMS	C408.11, C408.2.5.2, C408.3.2; ASHRAE 90.1 – 4.2.2.3, 6.7.2.2, 6.7.2.3.5.2, 8.7.2, 9.4.3.2.2, 9.7.2.2

TR1 Special Inspections (MECHANICAL)

YES	NO	INSPECTION	NYC BC 2022
X		MECHANICAL SYSTEMS	1705.21.3
X		FIRE RESISTANT PENETRATIONS AND JOINTS	1705.17
X		POST INSTALLED ANCHORS	1705.37

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 FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.

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

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

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

7. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE OTHER TRADES IS REQUIRED.

8. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO 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.

9. 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.

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

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

12. 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.

13. 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.

14. 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.

15. 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.

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

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

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

19. 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.

20. 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.

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

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

23. 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.

24. 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.

25. 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.

GENERAL HVAC NOTES

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. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO, AND WITHIN 50 FT. OF, ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS).

12. LOCATE ALL TEMPERATURE, PRESSURE, 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.

13. 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.

14. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

15. 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.

16. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.

17. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.

18. 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.

19. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.

20. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.

21. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.

22. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.

23. REINFORCEMENT, DETAILING, AND PLACEMENT OF CONCRETE SHALL CONFORM TO ASTM 315 AND ACI 318. CONCRETE SHALL CONFORM TO ASTM C94. CONCRETE WORK SHALL CONFORM TO ACI 318 PART ENTITLED "CONSTRUCTION REQUIREMENTS". COMPRESSIVE STRENGTH IN 28 DAYS SHALL BE 3,000 PSI. TOTAL AIR CONTENT OR EXTERIOR CONCRETE SHALL BE BETWEEN 5 AND 7 PERCENT BY VOLUME. SLUMP SHALL BE BETWEEN 3 AND 4 IN. CONCRETE SHALL BE CURED FOR 7 DAY AFTER PLACEMENT.

24. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS SHALL BE 6 IN. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 6 IN. ON EACH SIDE. CONCRETE HOUSEKEEPING PADS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE THE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.

25. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.

26. 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.

AIR OUTLETS

GENERAL:

1) MARGIN TYPES, COLORS, FINISH AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING AND WALL DETAILS AND SPECIFICATIONS.

2) FRAME TYPE SUITABLE FOR MOUNTING IN CEILING OR WALL CONSTRUCTION AS INDICATED ON ARCHITECTURAL PLANS.

3) EXACT LOCATION OF ALL AIR OUTLETS AS PER ARCHITECTURAL PLANS.

4) SUITABLE FOR OPERATION AT 20% EXCESS AND 20% LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20% EXCESS AND 60% LESS THAN NOTED CAPACITY FOR VARIABLE VOLUME SYSTEMS. MANUFACTURER RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.

5) ALL DIFFUSERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. DAMPER OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLETS.

A. SQUARE DIFFUSERS: DIFFUSERS SHALL BE STEEL CONSTRUCTION PAINTED WHITE SIMILAR TO ANEMOSTAT

NOISE CONTROL

A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.

B. PROVIDE SOUND LINING FOR THE FOLLOWING DUCTWORK:

1) ALL DUCTWORK WITHIN NOT LESS THAN 20 FT ON EACH SIDE OF ALL FANS AND AC UNITS.
2) AIR TRANSFER DUCTS.
3) DOWNSTREAM OF ALL CONSTANT VOLUME BOXES FOR A MINIMUM OF 15 FT.
4) ALL MIXED AIR PLENUMS.
5) FULL EXTENT OF SUPPLY DUCTS SERVING CONFERENCE ROOMS.
6) ALL EXPOSED INTERIOR SUPPLY DUCTWORK.
7) ALSO WHERE NOTED ON A DRAWING.

C. SOUND LINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1.5 IN. THICKNESS, MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMACOTE LINA COUSTIC.

D. ALL SOUND LINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.

PIPING INSULATION

A. PIPING SERVING AS PART OF A HEATING OR COOLING SYSTEM SHALL BE THERMALLY INSULATED IN ACCORDANCE WITH TABLE C403.11.3.

B. PIPING, VALVES AND FITTINGS TO BE INSULATED:

1) LOW TEMPERATURE PIPING SYSTEMS - 0 TO 60 DEG F INCLUDING:

CONDENSATE DRAIN PIPING.

INSULATION SCHEDULE - PIPING

SERVICE	SIZE	THICKNESS	MATERIAL FINISH
REFRIGERANT PIPING		1.5"	P-6
CONDENSER DRAIN PIPING (IF RUNNING THROUGH EXTERIOR WALL)		1.0"	P-6

2) PROTECTIVE COVERINGS SHALL BE INSTALLED ON AREAS OF INSULATION THAT ARE EXPOSED TO WEATHER OR SUBJECT TO MECHANICAL DAMAGE. THE PROTECTIVE COVERING SHALL BE:

a. ARMA-CHEK SILVER" MULTI-LAYER LAMINATE OF ALUMINUM, COATED WITH A UV PROTECTIVE FILM AND BACKED WITH A FLEXIBLE PVC FILM. THE MATERIAL SHOULD BE ADHERED WITH ARMAFLEX 520 ADHESIVE OR EQUIVALENT, AND ALL JOINS AND SEAMS SECURED WITH "ARMA-CHEK SILVER TAPE". INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS.

OR

b. HIGH DENSITY RUBBER CLADDING OF THE "ARMA-CHECK R" TYPE BONDED USING AN APPROPRIATE FULL CONTACT ADHESIVE WITH A MINIMUM 50 MM OVERLAP AT ALL BUTT JOINTS AND LONGITUDINAL SEAMS. A WEATHER-PROOF MASTIC SEALANT SHALL BE APPLIED OVER ALL SEAMS AND JOINTS. ALL MATERIAL SHALL BE OVERLAPPED AND STAGGERED IN SUCH A WAY AS TO ENSURE A WATERSHED IS ALWAYS PROVIDED. INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS. ALL EXCESS ADHESIVE VISIBLE ON THE SURFACE OF THE COMPLETED ASSEMBLY SHALL BE REMOVED USING AN APPROPRIATE CLEANING MATERIAL.

OR

c. METAL CLADDING, COMPRISED OF COATED SHEET METAL, WITH ALL EXTERNAL JOINTS AND FIXING MADE WEATHER-PROOF WITH SILICONE SEALANT.

C. MATERIAL:

1) TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.24 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS-CORNING 650 ASJ.
2) TYPE P-3: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS FITTING, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO EPOLUX HAMFAB MOLDED FITTINGS.
3) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI-LO TEMP INSULATION INSERTS.
4) TYPE P-6: MINIMUM 6 LB MOLDED FOAMED PLASTIC. MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.

D. FINISH:

1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1. MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
2) TYPE F-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE-FIT, UL LABEL.
3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
4) TYPE F-6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.

E. INSTALLATION:

1) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.
3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION AT ALL HANGINGS.
4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

SPECIFICATIONS

SECTION 0001 - NOTICE TO BIDDERS

1.1 BIDDERS REPRESENTATIONS

A. THE BIDDER BY MAKING A BID REPRESENTS THAT:

THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.

B. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.

C. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.

D. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.

E. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.

1.2 EXISTING CONDITIONS AND COORDINATION

A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED THE BIDDER'S PERSONAL OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.

B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.

1.3 RESPONSIBILITIES

A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.

B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON-TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.

C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT-DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE-ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUT-DOWNS ARE TO BE KEPT TO A MINIMUM.

END OF SECTION 0001

SECTION 0101 - QUALITY OF WORK

1.1 WORKMANSHIP

A. ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.

B. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST TO THE OWNER.

C. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.

1.2 CODE COMPLIANCE

A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

END OF SECTION 0101

SECTION 0102 -REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS

A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.

1.2 SUBMITTALS

A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.

1.3 RECORD DRAWINGS

A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.

1.4 EQUIPMENT OPERATING INSTRUCTIONS

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

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

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

END OF SECTION 0102

SECTION 078413—PENETRATION FIRE—STOPPING

1.1 QUALITY ASSURANCE
- A. INSTALLER QUALIFICATIONS: AN FM GLOBAL—APPROVED FIRE—STOP CONTRACTOR OR A UL—QUALIFIED FIRE—STOP CONTRACTOR.
- B. FIRE—TEST—RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL

1.2 PENETRATION FIRESTOPPING
- A. PENETRATIONS IN FIRE—RESISTANCE—RATED WALLS: F—RATINGS PER ASTM E 814 OR UL 1479.
- B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F— AND T—RATINGS PER ASTM E 814 OR UL 1479:
- C. PENETRATIONS IN SMOKE BARRIERS: L—RATINGS PER UL 1479.
- D. W—RATINGS: PER UL 1479.

1.3 INSTALLATION
- A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.

1.4 FIELD QUALITY CONTROL
- A. INSPECTION OF INSTALLED FIRE—STOPPING: BY OWNER—ENGAGED AGENCY ACCORDING TO ASTM E 2174.

1.5 THROUGH—PENETRATION FIRESTOP SYSTEM SCHEDULE

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

FOR THE FOLLOWING SYSTEMS:

METALLIC AND NON—METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:

- a. LATEX SEALANT
- b. SILICONE SEALANT
- c. INTUMESCENT PUTTY
- d. MORTAR
- h. SILICONE FOAM
- i. PILLOWS/BAGS
- j. INTUMESCENT WRAP STRIPS
- k. INTUMESCENT COMPOSITE SHEET

1.6 MANUFACTURERS
1. HILTI CONSTRUCTION CHEMICAL, INC
2. TREMCO INC.
3. 3M FIRE PROTECTION PRODUCTS

END OF SECTION 078413

SECTION 230517 — SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

1.1 SLEEVE—SEAL SYSTEMS
- A. FIELD—ASSEMBLED, MODULAR SEALING—ELEMENT UNIT FOR FILLING ANNULAR SPACE BETWEEN PIPING AND SLEEVE.
  1. SEALING ELEMENTS: EPDM RUBBER OR NBR.
  2. PRESSURE PLATES: CARBON STEEL, PLASTIC, STAINLESS STEEL.
  3. CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION—RESISTANT COATING, STAINLESS STEEL.
- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
  1. ADVANCE PRODUCTS & SYSTEMS, INC.
  2. CALPICO, INC.
  3. METRAFLEX COMPANY (THE).
  4. PIPELINE SEAL AND INSULATOR, INC.

1.2 SLEEVE—SEAL FITTINGS
- A. MANUFACTURED PLASTIC, SLEEVE—TYPE, PLASTIC OR RUBBER WATER—STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.

1.3 GROUT
- A. NON—SHRINK, FACTORY PACKAGED.

1.4 SLEEVE AND SLEEVE—SEAL SCHEDULE
- A. USE SLEEVES AND SLEEVE SEALS FOR THE FOLLOWING PIPING—PENETRATION APPLICATIONS:
  1. INTERIOR PARTITIONS:
     - a. PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED—STEEL—PIPE SLEEVES, PVC—PIPE SLEEVES.
     - b. PIPING NPS 6 (DN 150) AND LARGER: GALVANIZED—STEEL—SHEET SLEEVES.

END OF SECTION 230517

SECTION 230518 — ESCUTCHEONS FOR HVAC PIPING

PART 2 — PRODUCTS

2.1 ESCUTCHEONS
- A. ONE—PIECE, CAST—BRASS TYPE: WITH POLISHED, CHROME—PLATED AND ROUGH—BRASS FINISH AND SETSCREW FASTENER.
- B. ONE—PIECE, DEEP—PATTERN TYPE: DEEP—DRAWN, BOX—SHAPED BRASS WITH CHROME—PLATED FINISH AND SPRING—CLIP FASTENERS.
- C. ONE—PIECE, STAMPED—STEEL TYPE: WITH CHROME—PLATED FINISH AND SPRING—CLIP FASTENERS.

2.2 FLOOR PLATES
- A. ONE—PIECE FLOOR PLATES: CAST—IRON FLANGE WITH HOLES FOR FASTENERS.

PART 3 — EXECUTION

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

3.2 FIELD QUALITY CONTROL
- A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS.

END OF SECTION 230518

SECTION 230529 — HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS
- A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
- B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
  1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
  2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.

1.2 SUBMITTALS
- A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

1.3 QUALITY ASSURANCE
- A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE — STEEL."

1.4 COMPONENTS
- A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL
- B. TRAPEZE PIPE HANGERS: CARBON OR STAINLESS STEEL
- C. FIBERGLASS PIPE HANGERS: —CLEVIS, CENTURY COMPOSITES, COOPER B—LINE
- D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER
- E. FIBERGLASS STRUT SYSTEMS: COOPER B—LINE
- F. THERMAL—HANGER SHIELD INSERTS:
- G. FASTENER SYSTEMS: POWDER—ACTUATED FASTENERS OR MECHANICAL—EXPANSION ANCHORS
- H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB—MOUNTED TYPE
- I. EQUIPMENT SUPPORTS.

END OF SECTION 230529

SECTION 230548 — VIBRATION CONTROLS FOR HVAC EQUIPMENT

PART 1 — GENERAL

1.1 PERFORMANCE REQUIREMENTS
- A. SEISMIC—RESTRAINT LOADING:
  1. SITE CLASS AS DEFINED IN THE IBC: A, B
  2. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC: I II III
     - a. COMPONENT IMPORTANCE FACTOR: 1.0
     - b. COMPONENT RESPONSE MODIFICATION FACTOR: 2.5
     - c. COMPONENT AMPLIFICATION FACTOR: 2.5.
  3. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND) 18%
  4. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1—SECOND PERIOD: 8%

1.2 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

1.3 FIELD QUALITY CONTROL
- A. TESTING: BY EITHER: OWNER—ENGAGED AGENCY, CONTRACTOR—ENGAGED AGENCY, OR CONTRACTOR.

PART—2 PRODUCTS

1.4 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. COOPER B—LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
  5. HILTI, INC.
  6. ISOLATION TECHNOLOGY, INC.
  7. KINETICS NOISE CONTROL.
  8. LOOS & CO.; CABLEWARE DIVISION.
  9. MASON INDUSTRIES.
  10. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
  11. UNISTRUT; TYCO INTERNATIONAL, LTD.
  12. VIBRATION ELIMINATOR CO., INC.
  13. VIBRATION ISOLATION.
  14. VIBRATION MOUNTINGS & CONTROLS, INC.

END OF SECTION 230548

SECTION 230593 — TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY
- A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
  1. AIR SYSTEMS: CONSTANT—VOLUME.

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 SJECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 230713 — DUCT INSULATION

1.1 QUALITY ASSURANCE

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

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

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

1.4 ITEMS NOT INSULATED:
1. FIBROUS—GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE 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. DOUBLE—WALL RECTANGULAR DUCTS AND FITTINGS.
  1. FIBROUS—GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
  2. PERFORATED INNER DUCT.
- C. SINGLE—WALL ROUND AND FLAT—OVAL DUCTS AND FITTINGS.
- D. DOUBLE—WALL ROUND AND FLAT—OVAL DUCTS AND FITTINGS.
  1. FIBROUS—GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
  2. PERFORATED INNER DUCT.
- E. SHEET METAL MATERIALS:
  1. GALVANIZED SHEET STEEL.
  2. PVC—COATED, GALVANIZED SHEET STEEL.
  3. CARBON—STEEL SHEETS.
  4. STAINLESS—STEEL SHEETS.
  5. ALUMINUM SHEETS.
  6. FACTORY—APPLIED ANTI—MICROBIAL COATING.
- F. DUCT LINER:
  1. FIBROUS GLASS, TYPE I, FLEXIBLE.
     - a. WITH ANTI—MICROBIAL EROSION—RESISTANT COATING.
  2. FLEXIBLE ELASTOMERIC.
  3. NATURAL FIBER.
- G. 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 SEISMIC—RESTRAINT DEVICES
- A. CHANNEL SUPPORT SYSTEM.
- B. STAINLESS—STEEL RESTRAINT CABLES.
- C. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED—SUPPORT—SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS OR REINFORCING STEEL ANGLE CLAMPED TO HANGER ROD.

1.4 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.

1.5 DUCT SCHEDULE
- A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
  1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

THERMOSTAT CONTROL

A. 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:

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).

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

B. 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.

C. C403.4.1.2 DEADBAND (MANDATORY)

WHERE 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:

THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.

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

D. C403.4.1.3 SETPOINT OVERLAP RESTRICTION (MANDATORY)

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

E. C403.4.1.4 HEATED OR COOLED VESTIBULES (MANDATORY)

THE HEATING SYSTEM FOR HEATED VESTIBULES AND AIR CURTAINS WITH INTEGRAL HEATING SHALL BE PROVIDED WITH CONTROLS CONFIGURED TO SHUT OFF THE SOURCE OF HEATING WHEN THE OUTDOOR AIR TEMPERATURE IS GREATER THAN 45°F (7°C). VESTIBULE HEATING AND COOLING SYSTEMS SHALL BE CONTROLLED BY A THERMOSTAT LOCATED IN THE VESTIBULE CONFIGURED TO LIMIT HEATING TO A TEMPERATURE NOT GREATER THAN 60°F (16°C) AND COOLING TO A TEMPERATURE NOT LESS THAN 85°F (29°C).

EXCEPTION: CONTROL OF HEATING OR COOLING PROVIDED BY SITE-RECOVERED ENERGY OR TRANSFER AIR THAT WOULD OTHERWISE BE EXHAUSTED.

F. C403.4.2 OFF-HOUR CONTROLS (MANDATORY)

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

EXCEPTIONS:

ZONES THAT WILL BE OPERATED CONTINUOUSLY.

ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.

G. C403.4.2.1 THERMOSTATIC SETBACK (MANDATORY)

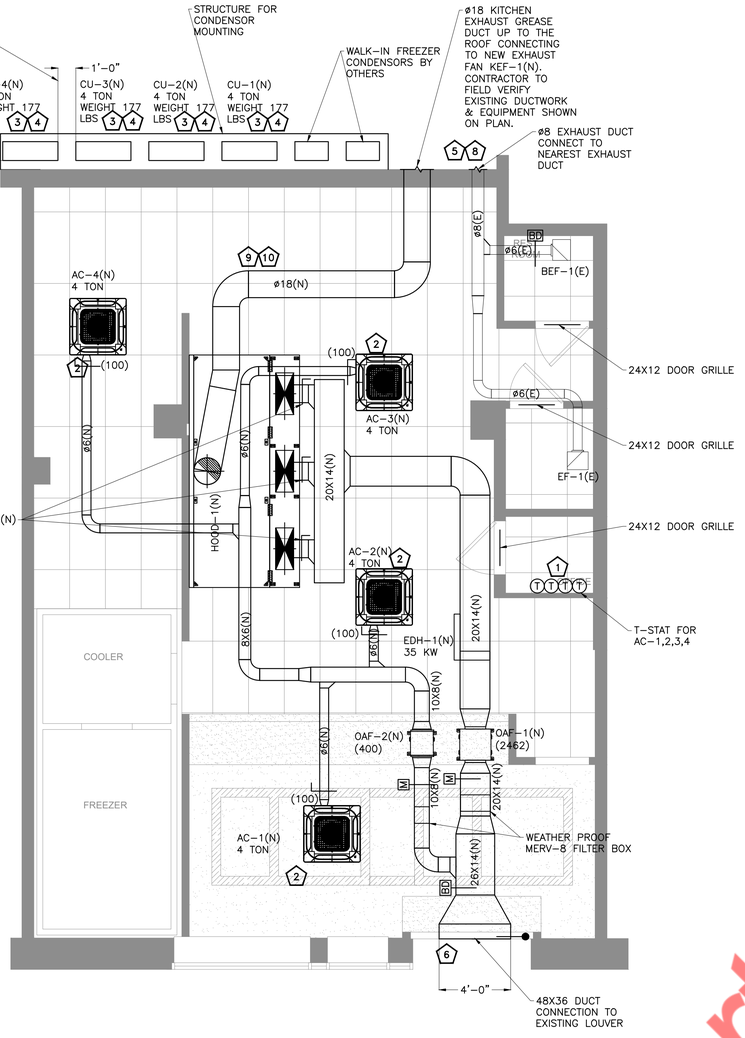
THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

H. C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN (MANDATORY)

AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

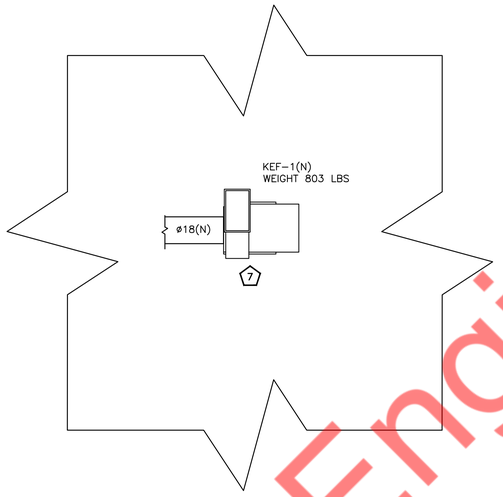
I. C403.4.2.3 AUTOMATIC START (MANDATORY)

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



1 MECHANICAL PLAN - FIRST FLOOR

1/4"=1'-0"



2 MECHANICAL PLAN - PARTIAL ROOF

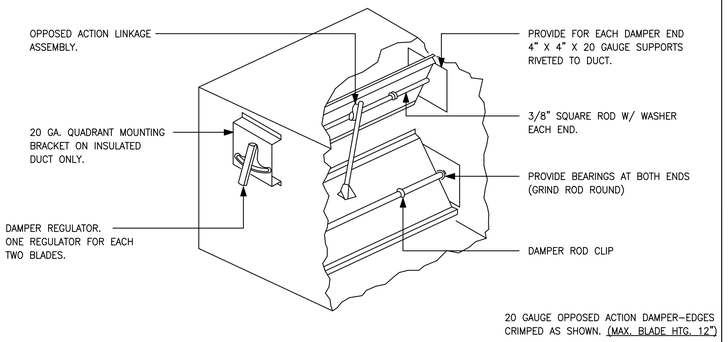
1/4"=1'-0"

MECHANICAL GENERAL NOTES

A. CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.
B. NEW DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING. OFFEST AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.
C. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
D. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
E. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.
F. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
G. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
H. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.
I. MOUNT DUCTWORK AS HIGH AS POSSIBLE.
J. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
K. NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.
L. PROVIDE R-8 INSULATION FOR OAI DUCT AND R-6 INSULATION FOR SUPPLY AND RETURN DUCT.
M. PROVIDE 1" CONDENSATE DRAIN FOR ALL AC'S.
N. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR PIPING INSULATION.
O. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR DUCTING.
P. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/ BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.
Q. CLEANOUT OPENING SHALL BE PROVIDED AT EVERY CHANGE IN DIRECTION WITHIN 3 FEET OF EXHAUST FAN FOR TYPE-1 HOOD.

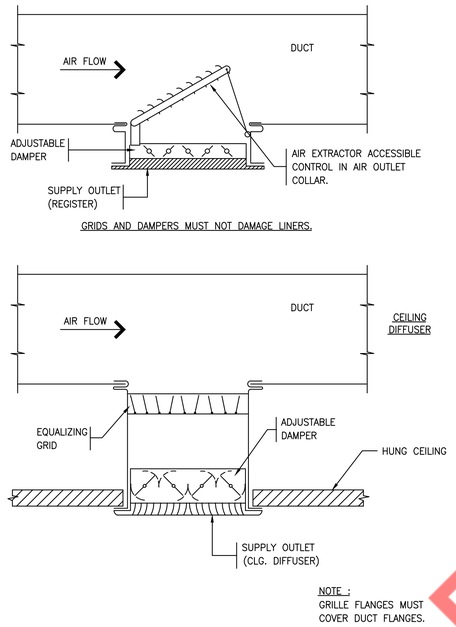
MECHANICAL PLAN KEY NOTES

1. LOCATION OF DIGITAL THERMOSTAT/HUMIDISTAT CONTROL. INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT. COORDINATE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN. PROVIDE LOCKABLE COVER.
2. CONNECT 1" CD TO SINK/LAV WITH AIR GAP FITTING. INSTALL CONDENSATE DRAIN WITH 1/4" SLOPE. SLOPE SHALL BE TOWARDS SINK/DRAIN TRENCH. PROVIDE 1" INSULATION TO CONDENSATE DRAIN.
3. INSTALL OUTDOOR CONDENSING UNITS ON THE WALL WITH ALL REQUIRED ACCESSORIES. COORDINATE EXACT LOCATION IN FIELD.
4. PROVIDE STRUCTURAL SUPPORTS AS REQUIRED.COORDINATE WITH STRUCTURAL ENGINEER.
5. EXAHUST DUCT TO CONNECT EXISTING FANS OR EXISTING EXHAUST AIR NETWORK OF THE BASE BUILDING IF ANY. COORDINATE LOCATION IN FIELD. EXHAUST TERMINATION SHALL BE 10 FEET FROM MECHANICAL AIR INTAKE AND 3 FEET FROM OPERABLE OPENING.
6. PROVIDE MIN. 6 S.F FREE AREA WITH EXISTING LOUVER/HATCH AT THE SIDE OF STAIR. CONFIRM EXACT SIZE AT SITE.
7. KITCHEN EXHAUST TERMINATION SHALL NOT BE LESS THAN 40 INCHES ABOVE ROOF. KITCHEN EXHAUST INSTALLATION SHALL BE ACCORDING TO SECTION 506 OF NYCMC.
8. EXISTING EXHAUST RISER TO REMAIN AND REUSE. CONTRACTOR TO FIELD VERIFY EXACT LOCATION ON FILED. NOTIFY ANY DISCREPANCY TO ENGINEER BEFORE BID.
9. TYPE-1 HOOD. RUN SHEET METAL DUCT FROM CONNECTION ON HOOD TO RESPECTIVE EXHAUST FAN. OFFSET AND TRANSITION AT CONNECTIONS AS NEEDED. VERIFY DIMENSIONS PRIOR TO FABRICATION OR INSTALLATION. USE FACTORY-MANUFACTURED PIPE AND FITTINGS ONLY.
10. DUCT SHALL BE SLOPED 1/4" UNIT VERTICAL IN 12" UNIT HORIZONTAL TOWARD HOOD.



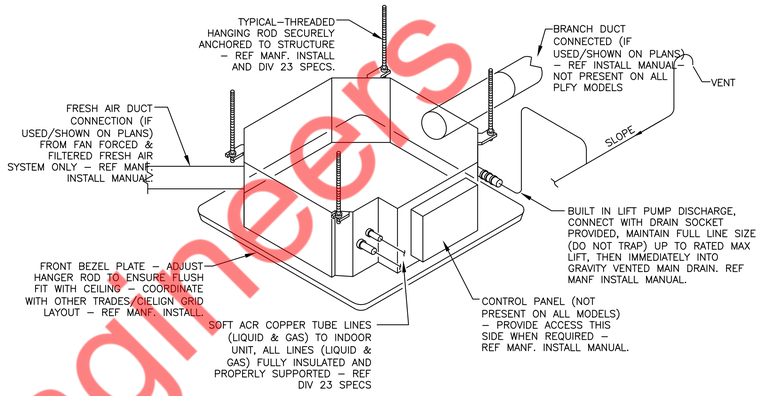
NOTE : 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

1 / M-501 LOW PRESSURE BALANCING DAMPER N.T.S

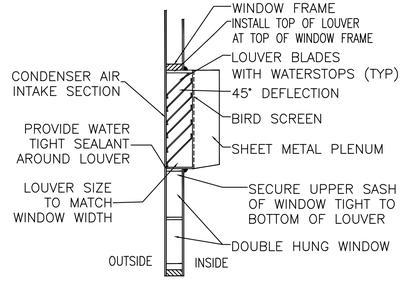


NOTE :
GRILLE FLANGES MUST COVER DUCT FLANGES.

2 / M-501 DIFFUSER AND REGISTER CONNECTIONS N.T.S

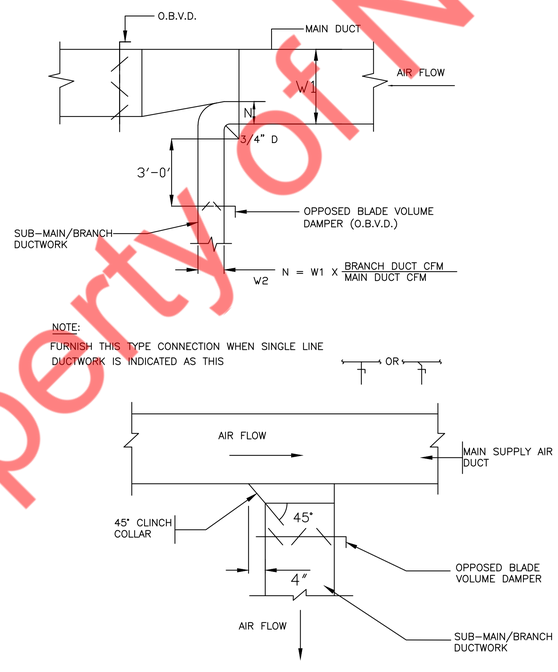


3 / M-501 4 WAT CASSETTE AC DETAILS N.T.S

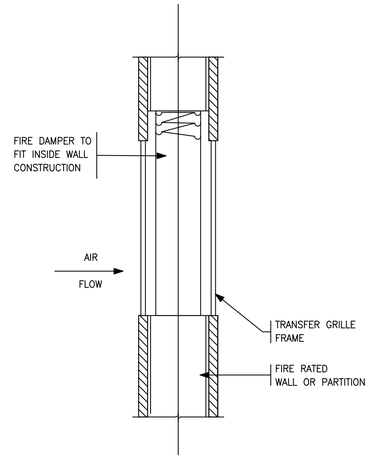


INTAKE LOUVER

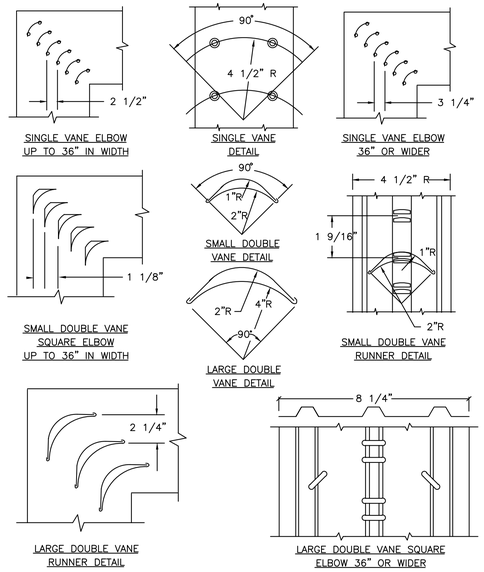
4 / M-501 LOUVER DETAIL N.T.S



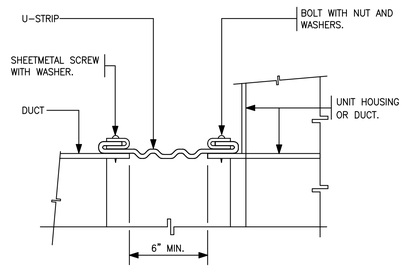
5 / M-501 SUB–MAIN/BRANCH DUCT CONNECTION N.T.S



6 / M-501 VERTICAL FIRE DAMPER N.T.S



1 M-502 N.T.S **LOW VELOCITY DUCTWORK ELBOWS**



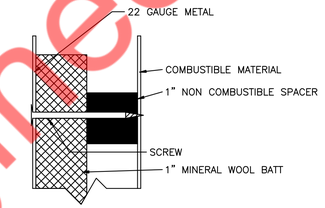
2 M-502 N.T.S **FLEXIBLE CONNECTION DETAIL**

CLEARANCE AND CLEARANCE REDUCTION METHODS
NFPA 96 1-3.2 CLEARANCE NOTE: HOODS, GREASE EXTRACTORS, DUCTS, ECOLOGY UNITS, FANS SHALL HAVE A CLEARANCE OF AT LEAST.

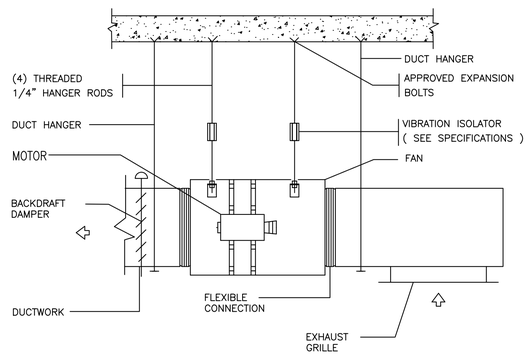
18" TO COMBUSTIBLES
3" TO LIMITED COMBUSTIBLES, 6" IN A SHAFT
0" TO NON COMBUSTIBLES, 6" IN A SHAFT

WHERE SPACE DOES NOT ALLOW FOR THE NOTED CLEARANCES AS IT PERTAINS TO THE TYPE OF CONSTRUCTION A CLEARANCE REDUCTION METHOD MAY BE APPLIED.

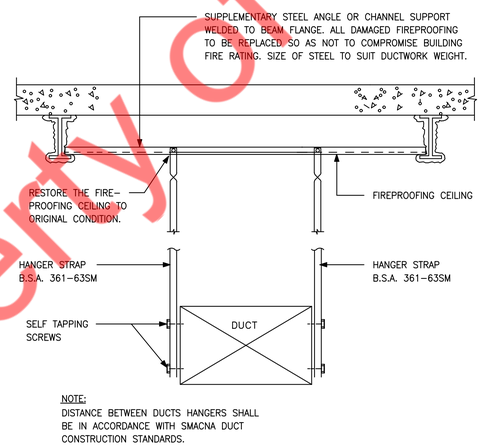
OPTION A AS ILLUSTRATED BELOW
OPTION B IS TO USE A LISTED 3M FIRE DUCT WRAP 615



3 M-502 N.T.S **CLEARANCE TO COMBUSTIBLES**



4 M-502 N.T.S **INLINE FAN HANGING SUPPORT DETAIL**



NOTE:
DISTANCE BETWEEN DUCTS HANGERS SHALL BE IN ACCORDANCE WITH SMACNA DUCT CONSTRUCTION STANDARDS.

5 M-502 N.T.S **METHOD OF HANGING DUCTWORK**

VENTILATION CALCULATION

ROOM NAME	AREA (SQ.FT.)	NO. OF PEOPLE/1000sq.ft AS PER NYCMC 2020	NO. OF PEOPLE AS PER NYCMC 2020	NO. OF CHAIR	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER NYCMC 2014		REQ. OSA CFM	PROVIDED OSA CFM	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR CFM/FIXT.)	REQUIRED EXHAUST (CFM)	PROVIDED EXHAUST (CFM)
						CFM/PEOPLE	CFM/SQ.FT					
PICK-UP	280	100	28	0	28	7.5	0.18	260		0	0	0
KITCHEN	770	-	-	-	-	-	-	0		0.7	539	2678
OFFICE	20	5	1	0	1	5	0.06	6	400	0	0	0
RESTROOM	25	0	0	0	0	0	0	0		50/70	70	70
BOH	28	0	0	0	0	0	0.12	3		0	0	70
TOTAL								270	400		539	2818

AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
KEF-1 (N)	HOOD	-	-	-	2678 CFM
BEF-1 (E)	RESTROOM	-	-	-	70 CFM
EF-1 (E)	ELEC ROOM	-	-	-	70 CFM
OAF-1(N)	KITCHEN	2462 CFM	2462 CFM	-	-
OAF-2(N)	AC UNITS	400 CFM	400 CFM	-	-
	TOTAL:	2862 CFM	2862 CFM	-	2818 CFM
BUILDING PRESSURE:		.....		44 CFM	**POSITIVE**

NOTES:
1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON FRESH AIR TAP & EXAHUST DUCTS TO MATCH AIR FLOW AS MENTIONED IN ABOVE TABLE.

INDOOR AC UNIT SCHEDULE

MAKE:DAIKIN

UNIT TAG	LOCATION	TYPE	CAP. (TON)	AIR FLOW CFM	COOLING CAPACITY				HEATING MBH		ELECTRICAL DATA			DIMENSIONS	WEIGHT (LBS.)	MODEL NO.
					TOTAL MBH	SENSIBLE MBH	EADB °F	EAWB °F	TOTAL MBH	EADB °F	V/PH/HZ	MCA (A)	MOP (A)	WXHXD (IN.)		
AC-1(N)	SEE PLAN	CEILING CASSETTE	4.0	1218.0	50	23	80	73.6	54	70	208-230/1/60	1.8	15	33.1 x 11.3 x 33.1	57.3	FXFQ48TVJU
AC-2(N)	SEE PLAN	CEILING CASSETTE	4.0	1218.0	50	23	80	73.6	54	70	208-230/1/60	1.8	15	33.1 x 11.3 x 33.1	57.3	FXFQ48TVJU
AC-3(N)	SEE PLAN	CEILING CASSETTE	4.0	1218.0	50	23	80	73.6	54	70	208-230/1/60	1.8	15	33.1 x 11.3 x 33.1	57.3	FXFQ48TVJU
AC-4(N)	SEE PLAN	CEILING CASSETTE	4.0	1218.0	50	23	80	73.6	54	70	208-230/1/60	1.8	15	33.1 x 11.3 x 33.1	57.3	FXFQ48TVJU

NOTES FOR INDOOR UNITS
1) SUPPLY AIR CFM BASED ON HIGH SPEED.
2) REFRIGERANT R410A SHALL BE PROVIDED.
3) PROVIDE MOUNTING BRACKETS AND ALL ASSOCIATED ACCESSORIES.
4) ALL REFRIGERANT PIPING TO BE SIZED PER MANUFACTURERS RECOMMENDATIONS.
5) INDOOR UNIT ACCESS PANEL FIELD-PROVIDED.
6) CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
7) AC TO INCLUDE ECM MOTORS WITH INTEGRAL FAN SPEED ADJUSTMENTS AND LOW, MED, HIGH SPEED LOW VOLTAGE CIRCUITS.
8)CONNECT CONDESATE DRAIN WITH 1/4" SLOPE TO NEAREST DRAIN TRENCH/SINK IN AN APPROVED MANNER.
9)360 DEGREE AIRFLOW DISTRIBUTION AND THREE ROOM SENSORS ENABLES OPTIMIZED OCCUPANT COMFORT AND EFFICIENCY
10)OPTIONAL SELF-CLEANING FILTER PANEL TO FURTHER INCREASE EFFICIENCY AND REDUCE MAINTENANCE COSTS
11)BUILT-IN CONDENSATE PUMP
12)INDIVIDUALLY CONTROLLED SUPPLY AIR LOUVERS FOR COMFORTABLE AIR SUPPLY
13)UNIT TO OPTIMIZABLE WITH UP TO 18 POSSIBLE AIRFLOW PATTERNS
14)STANDARD LIMITED WARRANTY: 10-YEAR WARRANTY ON COMPRESSOR AND ALL PARTS

ELECTRIC DUCT HEATER SCHEDULE

MAKE:GREENHECK

UNIT ID	LOCATION	DUCT HEATER DIMENSIONS (IN)			QTY.	ELECTRICAL DATA					MODEL	HEATER TYPE
		W	H	D		KW	V	PH	Hz	Amps		
EDH-1(N)	SEE PLAN	20	16	6	1	35	208	3	60	97.15	IDHE	SLIP IN

NOTES:
1) INSTALL ELECTRIC DUCT HEATER AS PER MANUFACTUR'S RECOMMENADATION.
2) PROVIDE T-STAT AND WIRE TO DUCT HEATER.
3) PROVIDE DISCONNECT SWTICH, VAPOR BARRIER, DUST TIGHT BOX AND FAN INTERLOCK SWITCH.
4) PROVIDE DUCT HEATER WITH SCR CONTROL.

AIR COOLED CONDENSING OUTDOOR UNIT

MAKE : DAIKIN

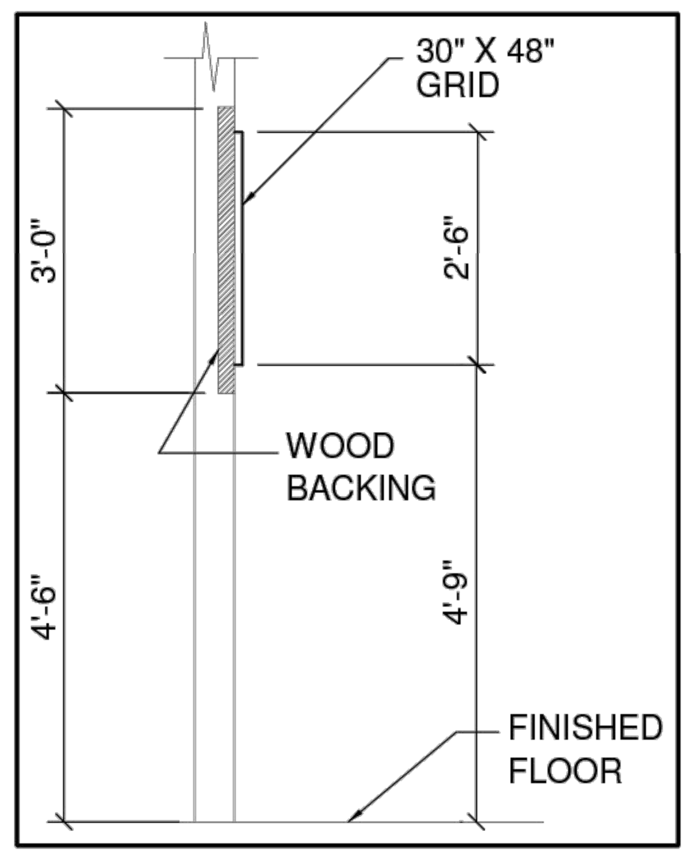
UNIT TAG	MODEL NO.	TYPE	NOMINAL CAPACITY TR	COOLING CAPACITY		HEATING MBH			CONNECTION RATIO %	UNIT DIMENSIONS WXHXD (IN.)	WEIGHT (LBS)	ELECTRICAL			HSPF	EER	SEER
				TOTAL MBH	AMBIENT DB °F	TOTAL MBH	AMBIENT DB °F	AMBIENT WB °F				(V/Hz/Ph)	MCA (A)	MOP (A)	NON-DUCTED	NON-DUCTED	NON-DUCTED
CU-1(N)	RXTQ48TAVJUA	AIR COOLED HEAT PUMP	4	50.4	90.7	40.5	13	10.8	100	37.0 x 39.0 x 12.6	177	208-230/1/60	29.1	35	10.0	10.3	18.0
CU-2(N)	RXTQ48TAVJUA	AIR COOLED HEAT PUMP	4	50.4	90.7	40.5	13	10.8	100	37.0 x 39.0 x 12.6	177	208-230/1/60	29.1	35	10.0	10.3	18.0
CU-3(N)	RXTQ48TAVJUA	AIR COOLED HEAT PUMP	4	50.4	90.7	40.5	13	10.8	100	37.0 x 39.0 x 12.6	177	208-230/1/60	29.1	35	10.0	10.3	18.0
CU-4(N)	RXTQ48TAVJUA	AIR COOLED HEAT PUMP	4	50.4	90.7	40.5	13	10.8	100	37.0 x 39.0 x 12.6	177	208-230/1/60	29.1	35	10.0	10.3	18.0

NOTES: OUTDOOR UNITS VRF HEAT PUMP
1. UNIT SHALL HAVE TEN YEAR EXTENDED WARRANTY FOR COMPRESSORS/PARTS.
2. PROVIDE LOW AMBIENT CONTROL FOR CONDENSING UNIT OPERATION DOWN TO -4°F.
3. PROVIDE COMPRESSOR CYCLE PROTECTOR.
4. MANUFACTURER MUST BE CERTIFIED, LISTED, AND LABELED PER AHRI 1230.
5. SYSTEM RATING DATA BASED ON DESIGN AMBIENT CONDITIONS FOR COOLING AND FOR HEATING.
6. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEED THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
7.SUBMITTED PERFORMANCE DATA MUST BE FULLY DE-RATED FOR ALL COMPONENTS AND ACCESSORIES, INCLUDING BUT NOT LIMITED TO, LINE LENGTH, VERTICAL SEPARATION, CONNECTION RATIO, DESIGN CONDITIONS, CONDENSER COIL COATING.
8. OUTDOOR REFRIGERANT LINESETS TO BE WRAPPED IN UV RESISTANT , FIRE RATED, AND ANTI MICROBIAL INSULATION PROTECTION BASED ON AIREX-FLEX GUARD OR EQUAL
9. OUTDOOR HEAT PUMPS TO BE LOCATED WITH PROPER CLEARANCES AND MUST PREVENT RE-CIRCULATION OF AIR. COORDINATE WITH MANUFACTURER AND ARCHITECT
10.EEV ACTUATORS MUST BE REMOVABLE FROM VALVE BODY WITHOUT DISTURBING THE REFRIGERANT SYSTEM.
11.FCU THERMOSTATS MUST PROVIDE +/- 1 DEGREE DEAD-BAND SET-POINT AND CONTROL CAPABILITY.
12.SYSTEM SHALL BE PROVIDED WITH I-TOUCH MANAGER CONTROLLER WITH WEB BASED SOFTWARE FOR DISPLAYING UP TO 8 DIII-NET SYSTEMS WITH 128 INDOOR UNITS PER SYSTEM.PC BY OTHERS.
13.MANUFACTURERS SUBMITTAL MUST INCLUDE REFRIGERANT PIPING DIAGRAM WITH PIPE DIAMETERS, LENGTHS, AND REFRIGERANT VOLUME.
14.SUBSTITUTE MANUFACTURER SHALL BE RESPONSIBLE FOR ADDITIONAL PIPING AND REFRIGERANT.
15.CONTRACTOR TO VERIFY PIPING DIMENSIONS.
16.INSTALLING CONTRACTOR MUST HAVE SUCCESSFULLY COMPLETED MANUFACTURERS CERTIFIED INSTALLATION CLASS WITHIN PAST 36 MONTHS.
17.CONTRACTOR TO FURNISH AND INSTALL INSULATION ON REFRIGERANT PIPING.
18.MANUFACTURERS REPRESENTATIVE MUST HAVE LOCAL STOCK OF PARTS AND FACTORY CERTIFIED TECHNICIAN ON STAFF.
19.MANUFACTURERS REPRESENTATIVE SHALL PROVIDE PROOF OF ONGOING INSTALLATION TRAINING AT THEIR LOCAL FACILITY FOR AT LEAST THE PAST 5 YEARS.
20.MANUFACTURERS REPRESENTATIVE SHALL PROVIDE PROOF OF CONTINUOUS SALES AND SUPPORT OF THEIR PRODUCTS FOR AT LEAST 15 YEARS.
21.MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DIRECT COSTS AND OPERATING COSTS INCREASES FOR 20 YEARS ASSOCIATED WITH ANY DEVIATIONS RESULTING FROM CHANGES IN DESIGN.
22.MANUFACTURER MUST PROVIDE 10 YEARS PARTS WARRANTY ON ALL FCUS, CONDENSING UNITS, AND MODE CHANGEOVER DEVICES. WARRANTY CONDITIONS MUST BE CLARIFIED DURING SUBMITTAL PHASE.
23.3-PHASE AIR COOLED CONDENSING UNITS MUST HAVE PUBLISHED PERFORMANCE DATA WITH 200% INDOOR CONNECTED CAPACITY.
24.CONDENSING UNITS MUST BE FURNISHED WITH PROTECTIVE COIL COATING TO WITHSTAND ASTM B117 SALT SPRAY TEST FOR A MINIMUM OF 1000 HOURS.PERFORMANCE OF SYSTEM MUST BE DE-RATED FOR COIL COATING.
25.MANUFACTURER MUST CERTIFY AND SUBMIT SYSTEM PERFORMANCE AT EXTREME CONDITIONS OF 122 DEGREES FDB AMBIENT IN COOLING MODE AND -4 DEGREES FWB IN HEATING MODE.
26.MANUFACTURER MUST PROVIDE 10 YEARS PARTS WARRANTY ON ALL FCUS AND CONDENSING UNITS. WARRANTY CONDITIONS MUST BE CLARIFIED DURING SUBMITTAL PHASE.

FAN SCHEDULE

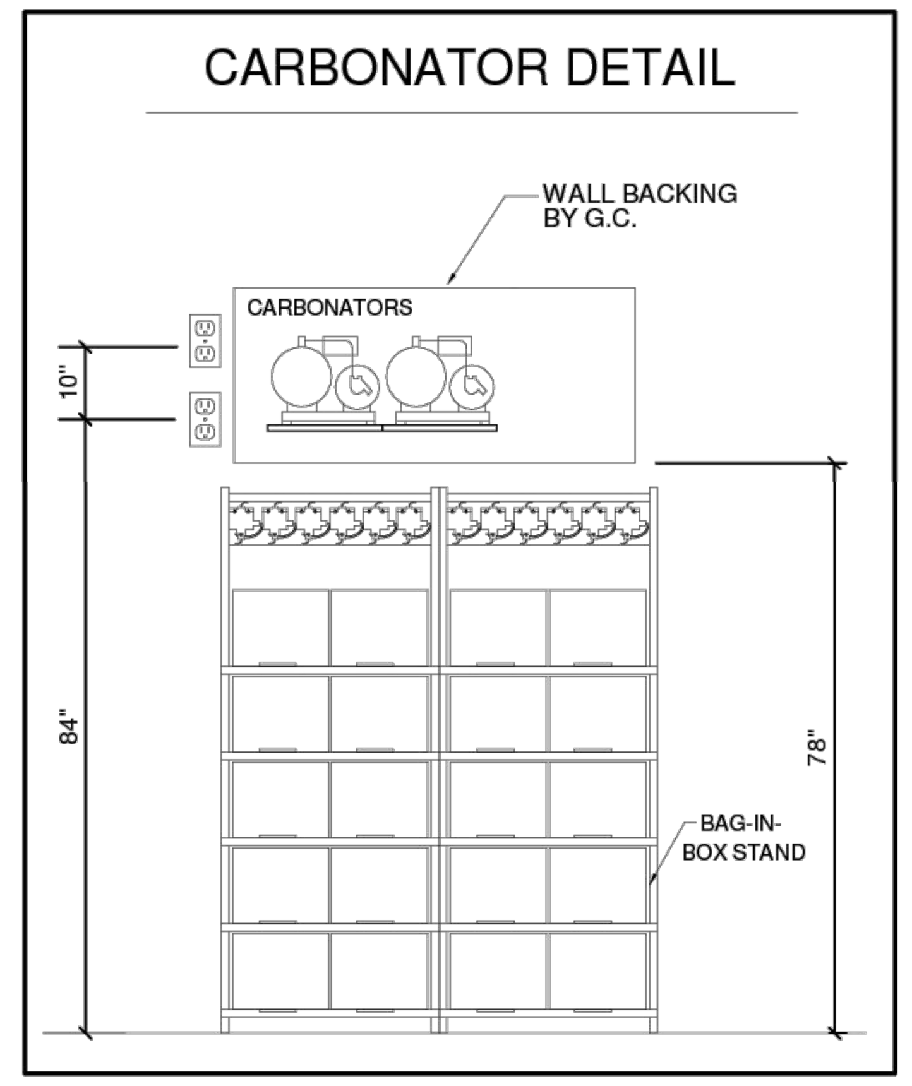
UNIT ID	MANUFACTURER	CFM	ESP(IN W.G.)	RPM	BREAK HORSE POWER	VOLTS/PH	FLA (A)	MODEL	NOTES
KEF-1 (N)	FRANKE	2678	3.5	1242	3.821	208/3	15.8	USB124DD-RM	1,2,3,4,7
BEF-1 (E)	S.A.E.	70	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	1,2,3,4,6,7
EF-1 (E)	S.A.E.	70	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	1,2,3,4,6,7
OAF-1(N)	GREENHECK	2462	0.5	1480	0.64	115/1	10	SQ-140-VG	1,2,3,4,5,7,8
OAF-2(N)	GREENHECK	400	0.5	1628	0.08	115/1	1.5	SQ-90-VG	1,2,3,4,5,7,8

REMARK:
1. UL 705 LISTED
2. FACTORY ATTACHED HINGES
3. WEATHERPROOF PRE-WIRED DISCONNECT SWITCH
4. PROVIDE PRE-WIRED SOLID STATE SPEED CONTROLLER
5. PROVIDE MOTORIZED DAMPER.
6. PROVIDE BACKDRAFT DAMPER.
7. PROVIDE ALL MANUFACTURER RECOMMENDED ACCESSORIES.
8. PROVIDE MERV 8 2"THICKNESS FILTER.



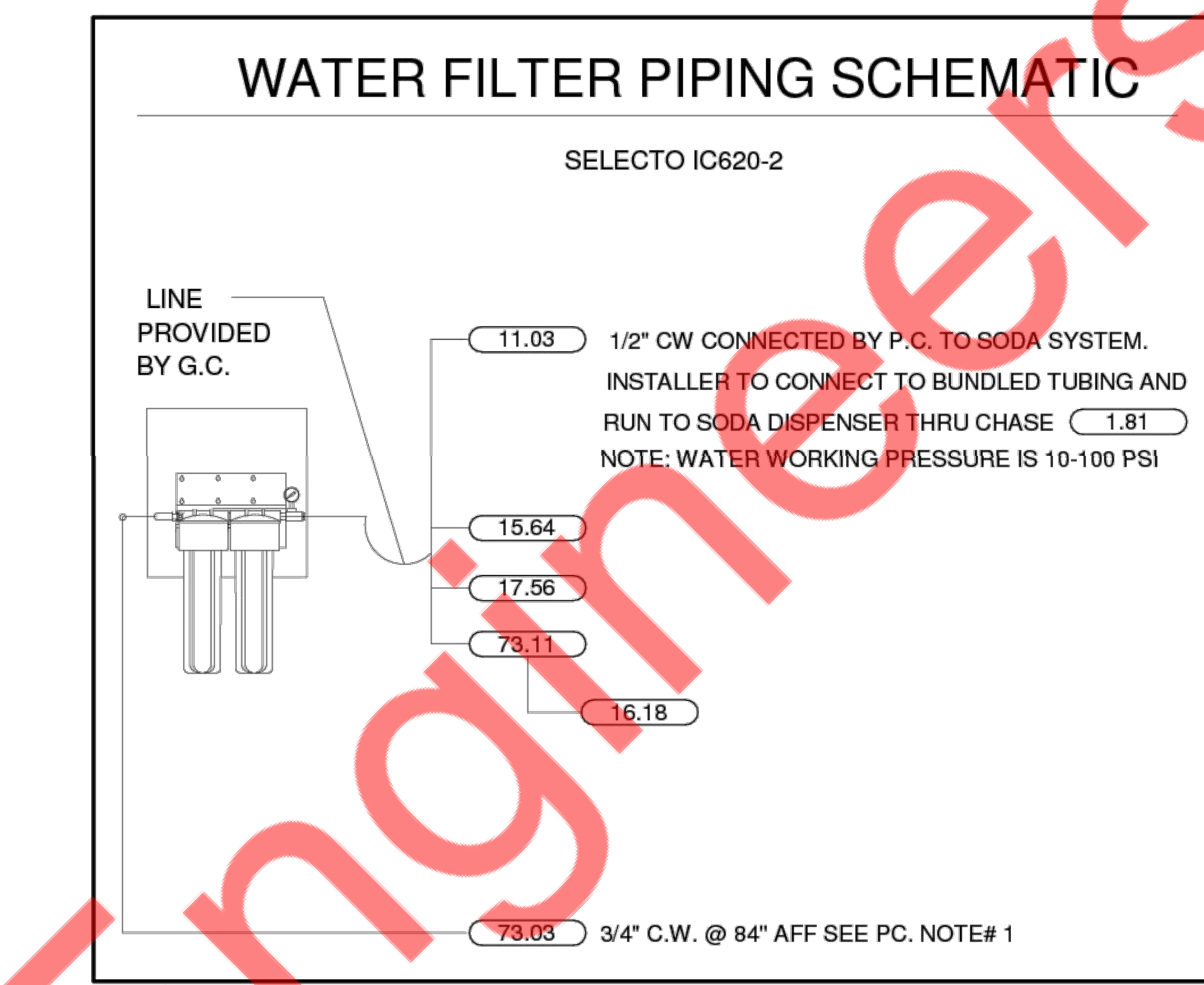
1 WOOD BACKING DETAIL 'B'

NOT TO SCALE



2 CARBONATOR DETAIL

NOT TO SCALE

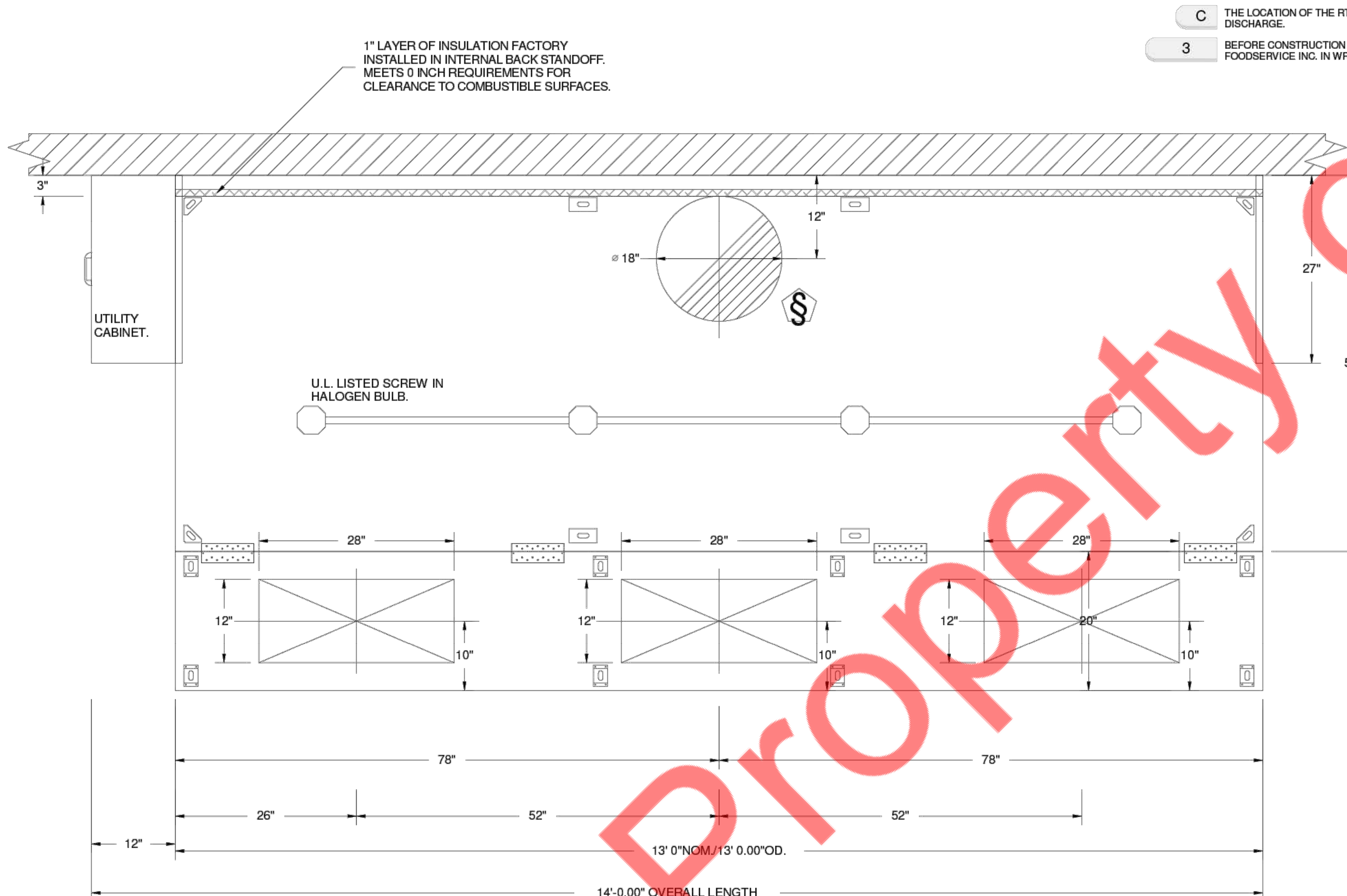


3 WATER FILTER IC620-2 DETAIL

NOT TO SCALE

FRANKE HOOD CURB OPENING NOTE

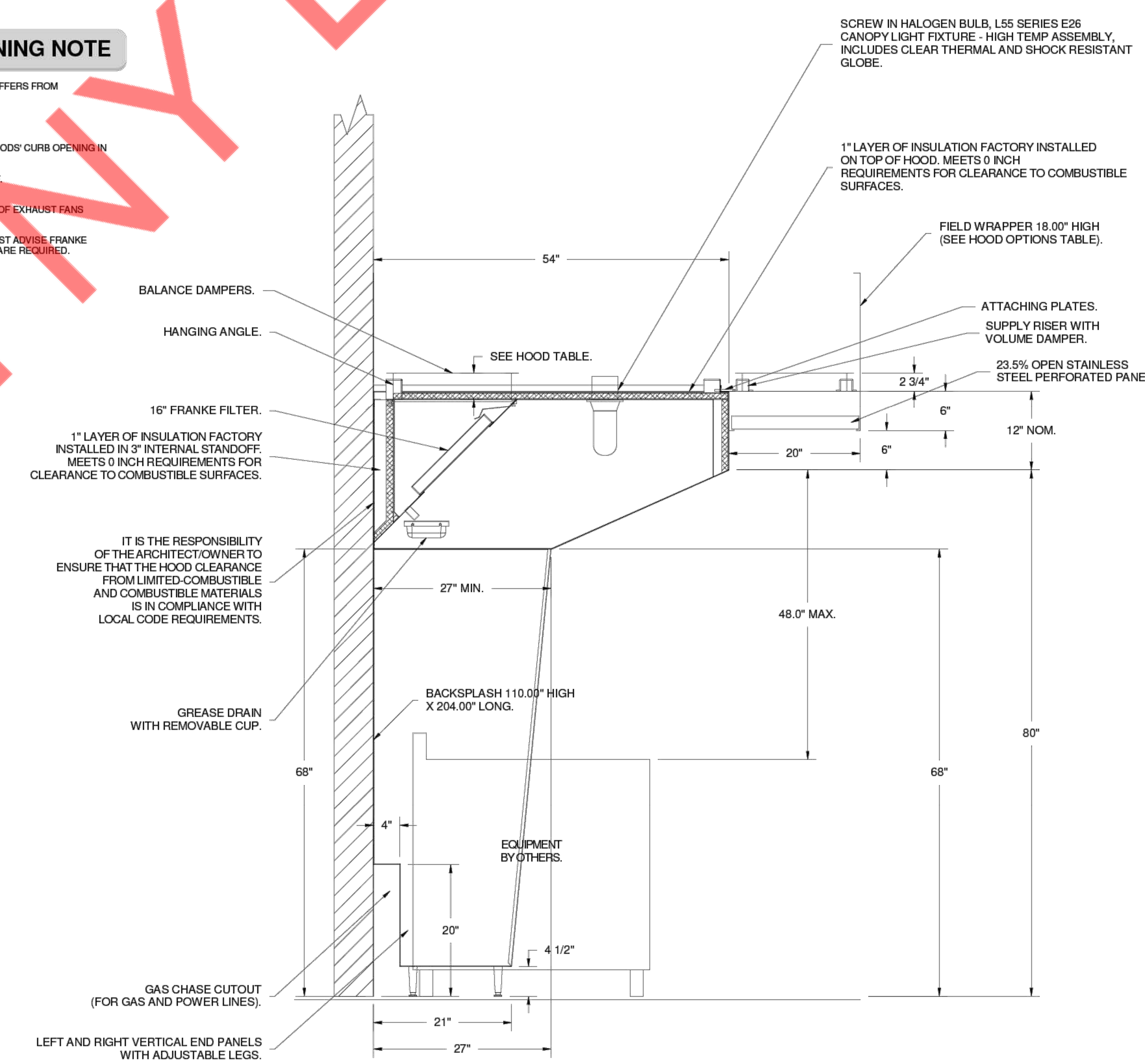
1. BROILER HOOD CURB OPENING LOCATION MAY DIFFERS FROM ARCHITECTURAL DRAWING.
2. ARCHITECT MUST ENSURE THAT:
   - A. THE ROOF TRUSSES DO NOT INTERFERE WITH HOODS' CURB OPENING IN ROOF DECK.
   - B. ROOF DECK HEIGHT IS BETWEEN 148" TO 151" AFF.
   - C. THE LOCATION OF THE RTU AIR INTAKE IS CLEAR OF EXHAUST FANS DISCHARGE.
3. BEFORE CONSTRUCTION STARTS, ARCHITECT MUST ADVISE FRANKE FOODSERVICE INC. IN WRITING IF ADJUSTMENTS ARE REQUIRED.



PLAN VIEW - HOOD #1

13' 0.00" LONG 5412FR-SND-2-PSP-F

NOTE: ADDITIONAL HANGING ANGLES PROVIDED FOR HOODS 12' AND LONGER.



SECTION VIEW - MODEL 5412FR-SND-2-PSP-F

HOOD - #1

REV	DATE	DESCRIPTION	BY
A	10/19/2022	INITIAL ISSUE	HP033

Make it Wonderful

FRANKE

Franke Foodservice Systems Americas, Inc.

800 Aviation Parkway
Smyrna, TN 37167

Tel. +800 472-2954

fs-customerservice.us@franke.com
www.frankesupply.com

SHEET NAME

K4.0

REVISION

A

FRANKE

FRANKE FOODSERVICE SYSTEMS AMERICAS, INC.

800 AVIATION PARKWAY
SMYRNA, TN USA 37167

PHONE: 1-800-877-5178
WWW.FRANKESUPPLY.COM
FS-BKSALES.US@FRANKE.COM

HOOD INFORMATION – JOB#5679546

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM WIDTH	LENG	HEIGHT	RISER(S) DIA	CFM	VEL	SP	TOTAL SUPPLY CFM	HOOD CONSTRUCTION	HOOD CONFIG END TO END	ROW
1		5412 FR-SND-2-PSP-F	FRANKE FOODSERVICE	13' 0"	600 DEG	I	HEAVY	206	2678			4"	18"	2678	1515	-0.746"	2062	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S) TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	LIGHT(S) QTY	TYPE	WIRE GUARD	UTILITY CABINET(S) LOCATION	SIZE	FIRE SYSTEM TYPE	SIZE	ELECTRICAL MODEL #	SWITCHES QUANTITY	FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
1		FRANKE FILTER	9	16"	16"		4	SCREW IN HALOGEN	NO	LEFT	12"x27"x24"	ANSUL R-102	3.0/3.0			YES	1002 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1		FIELD WRAPPER 18.00" HIGH FRONT, LEFT, RIGHT.
		BACKSPLASH 110.00" HIGH X 204.00" LONG 430 SS VERTICAL.
		BALANCE DAMPERS.
		INSULATION FOR TOP OF HOOD.
		INSULATION FOR BACK OF HOOD.
		RIGHT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 68" HIGH INSULATED 430 SS.
		LEFT VERTICAL END PANEL 27" TOP WIDTH, 21" BOTTOM WIDTH, 68" HIGH INSULATED 430 SS.

PATENT NUMBERS
AC-PSP (UNITED STATES) – US PATENT 7963830 B2.
AC-PSP WALL (CANADA) – CA PATENT 2820509.
AC-PSP ISLAND (CANADA) – CA PATENT 2520330.

PERFORATED SUPPLY PLENUM(S)

HOOD NO	TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	RISER(S) WIDTH	LENG	DIA	CFM	SP
1		Front	156"	20"	6"	MUA	12"	28"		687	0.179"
						MUA	12"	28"		687	0.179"
						MUA	12"	28"		687	0.179"

GREASE DUCT & CHIMNEY SPECIFICATIONS:
PROVIDE GREASE DUCT EQUAL TO FRANKE SYSTEMS MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE WELDING PROVIDING IT HAS BEEN INSTALLED PER THE MANUFACTURES INSTALLATION GUIDE.
PROVIDE RATED ACCESS DOORS AT EVERY CHANGE IN DIRECTION AND EVERY 12' ON CENTER. PER MANUFACTURES LISTING MODEL "DW" HORIZONTAL RUNS LESS THAN 75 FT. CAN BE SLOPED 1/16" PER 12", HORIZONTAL RUNS MORE THAN 75 FT. CAN BE SLOPED 3/16" PER 12".
DUCT SHOULD BE SLOPED AS MUCH AS POSSIBLE TO REDUCE THE CHANCE OF GREASE ACCUMULATION IN HORIZONTAL RUNS.

IF THE DUCT OR CHIMNEY IS WITHIN 18 INCHES OF COMBUSTIBLE MATERIAL, PROVIDE UL-2221 OR UL-103 HT LISTED DOUBLE WALL GREASE DUCT OR DOUBLE WALL CHIMNEY EQUAL TO FRANKE SYSTEMS MODEL "DW- 2R, 2R TYPE HT, 3R, OR 3Z" ROUND 20 GAUGE 430 STAINLESS INNER DUCT INSULATED WITH A 24 GAUGE 430 STAINLESS OUTER SHELL.

FRANKE SYSTEMS RECOMMENDS THE USE OF LISTED, PRE-FABRICATED ROUND GREASE EXHAUST DUCT TO REDUCE STATIC PRESSURE IN THE SYSTEM, MINIMIZE INSTALLATION AND INSPECTION TIMES, AND ENSURE DUCT IS LIQUID TIGHT

HVAC DISTRIBUTION NOTE

HIGH VELOCITY DIFFUSERS OR HVAC RETURNS SHOULD NOT BE PLACED WITHIN TEN (10) FEET OF THE EXHAUST HOOD. PERFORATED DIFFUSERS ARE RECOMMENDED.

EXHAUST FAN INFORMATION – JOB#5679546

FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1		1	USBI24DD-RM	FRANKE	2678	3.500	1242	ODP,PREMIUM	5.000	3.8210	3	208	15.8	887 FPM	747	31.2

FAN OPTIONS

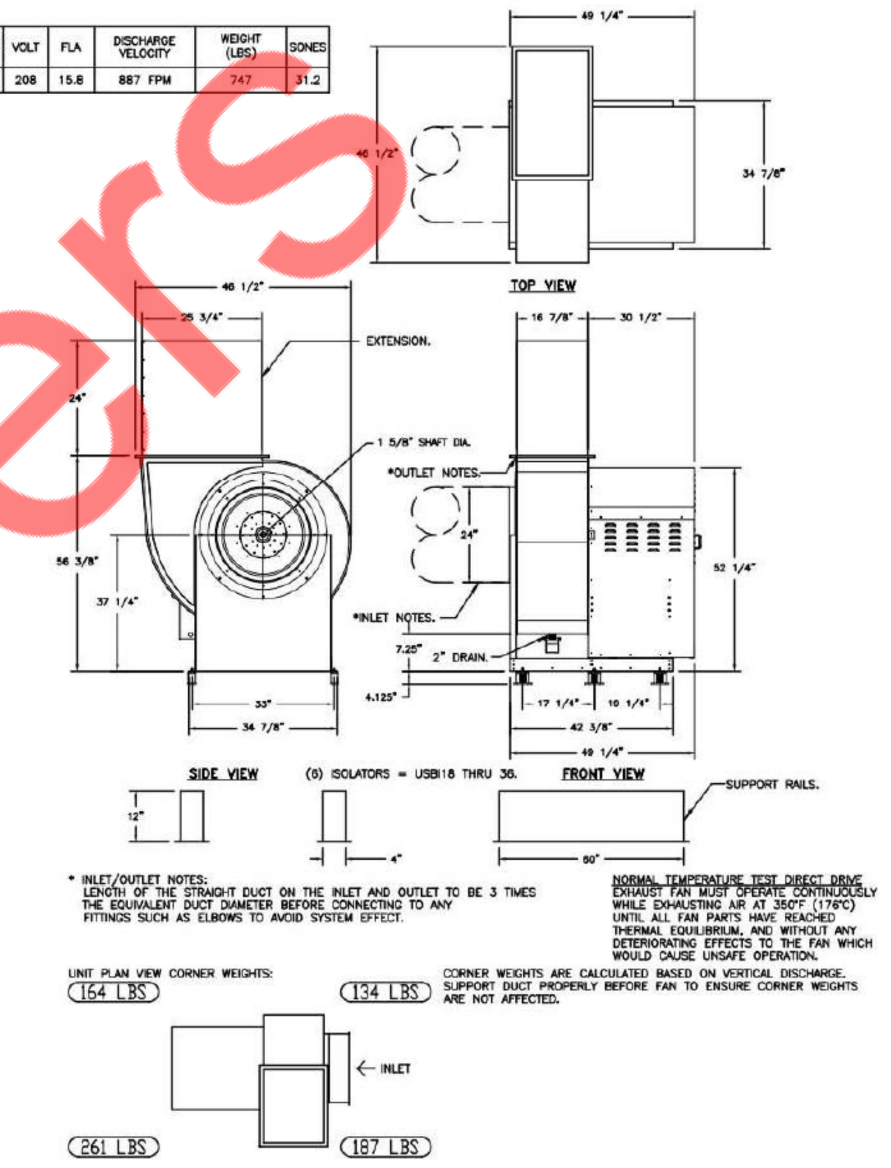
FAN UNIT NO	TAG	QTY	DESCRIPTION
1		1	BI24 – INLET SERVICE DUCT CONNECTION. USED TO CONNECT TO STANDARD 24" GREASE DUCT OR FIELD WELDED DUCT. INCLUDES (2) 7" RISERS BOLTED TO STANDARD INLET RISER
		1	UTILITY SET GREASE CUP
		1	BI24 – 24" DISCHARGE EXTENSION
		1	BI – DISCHARGE ORIENTATION VERTICAL UPPER LEFT – CW INLET SIDE
		1	BI24 – INLET CONNECTION STANDARD 24" FLANGED GREASE DUCT
		1	UTILITY SET – SPRING VIBRATION ISOLATORS – BI24 THRU BI30 / EQUIVALENT SIZED UTILITY SET / SIF 24-30 + FILTER BANK – INDOOR/OUTDOOR USE
		1	2 YEAR PARTS WARRANTY

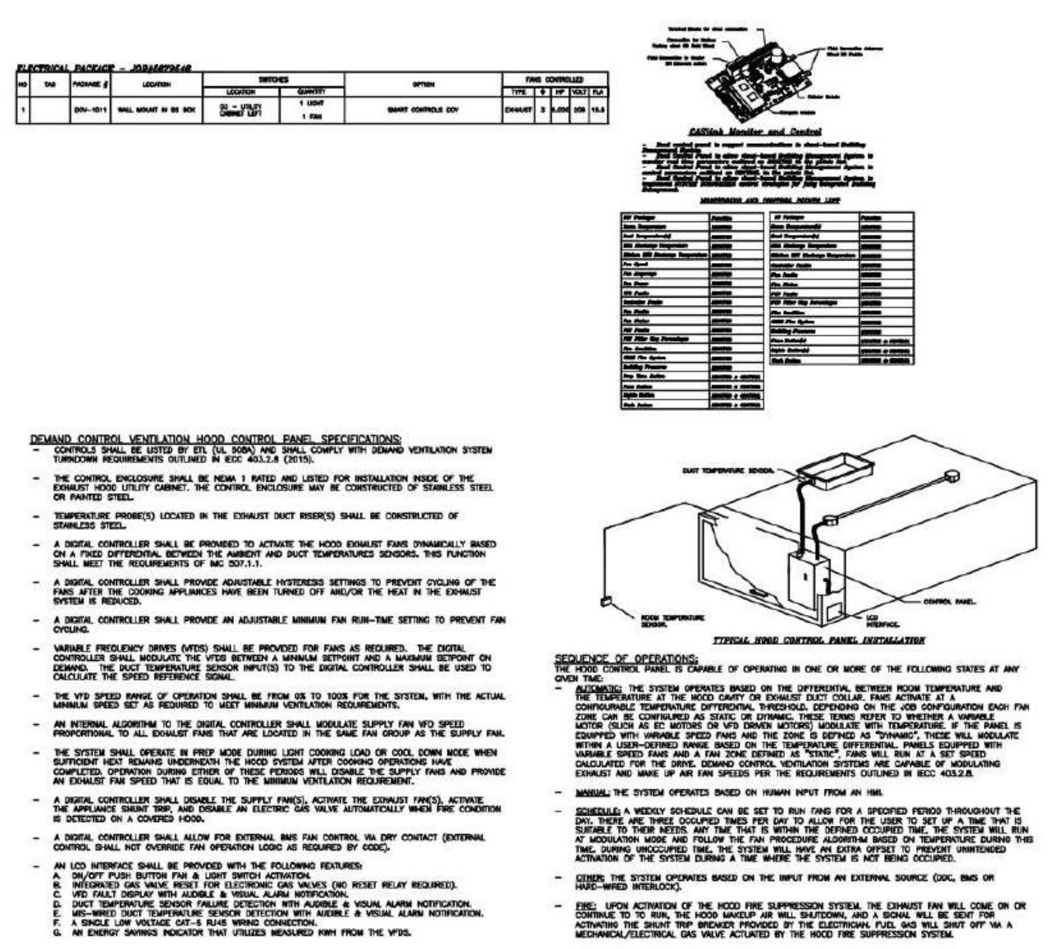
FAN ACCESSORIES

FAN UNIT NO	TAG	EXHAUST GREASE CUP	GRAVITY DAMPER	WALL MOUNT	SUPPLY SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1		YES						

CURB ASSEMBLIES

NO	ON FAN	WEIGHT	ITEM	SIZE
1	# 1	56 LBS	RAIL	4.000"W X 60.000"L X 12.000"H ALONG WIDTH, RIGHT COMES AS A SET OF 2.





SYSTEM DESIGN VERIFICATION (SDV)

IF ORDERED, CAS SERVICE WILL PERFORM A SYSTEM DESIGN VERIFICATION (SDV) ONCE ALL EQUIPMENT HAS HAD A COMPLETE START UP PER THE OPERATION AND INSTALLATION MANUAL. TYPICALLY, THE SDV WILL BE PERFORMED AFTER ALL INSPECTIONS ARE COMPLETE.

ANY FIELD RELATED DISCREPANCIES THAT ARE DISCOVERED DURING THE SDV WILL BE BROUGHT TO THE ATTENTION OF THE GENERAL CONTRACTOR AND CORRESPONDING TRADES ON SITE. THESE ISSUES WILL BE DOCUMENTED AND FORWARDED TO THE APPROPRIATE SALES OFFICE. IF CAS SERVICE HAS TO RESOLVE A DISCREPANCY THAT IS A FIELD ISSUE, THE GENERAL CONTRACTOR WILL BE NOTIFIED AND BILLED FOR THE WORK. SHOULD A RETURN TRIP BE REQUIRED DUE TO ANY FIELD RELATED DISCREPANCY THAT CANNOT BE RESOLVED DURING THE SDV, THERE WILL BE ADDITIONAL TRIP CHARGES.

DURING THE SDV, CAS SERVICE WILL ADDRESS ANY DISCREPANCY THAT IS THE FAULT OF THE MANUFACTURER. SHOULD A RETURN TRIP BE REQUIRED, THE GENERAL CONTRACTOR AND APPROPRIATE SALES OFFICE WILL BE NOTIFIED. THERE WILL BE NO ADDITIONAL CHARGES FOR MANUFACTURER DISCREPANCIES.

FIRE SYSTEM INFORMATION – JOB#5679546

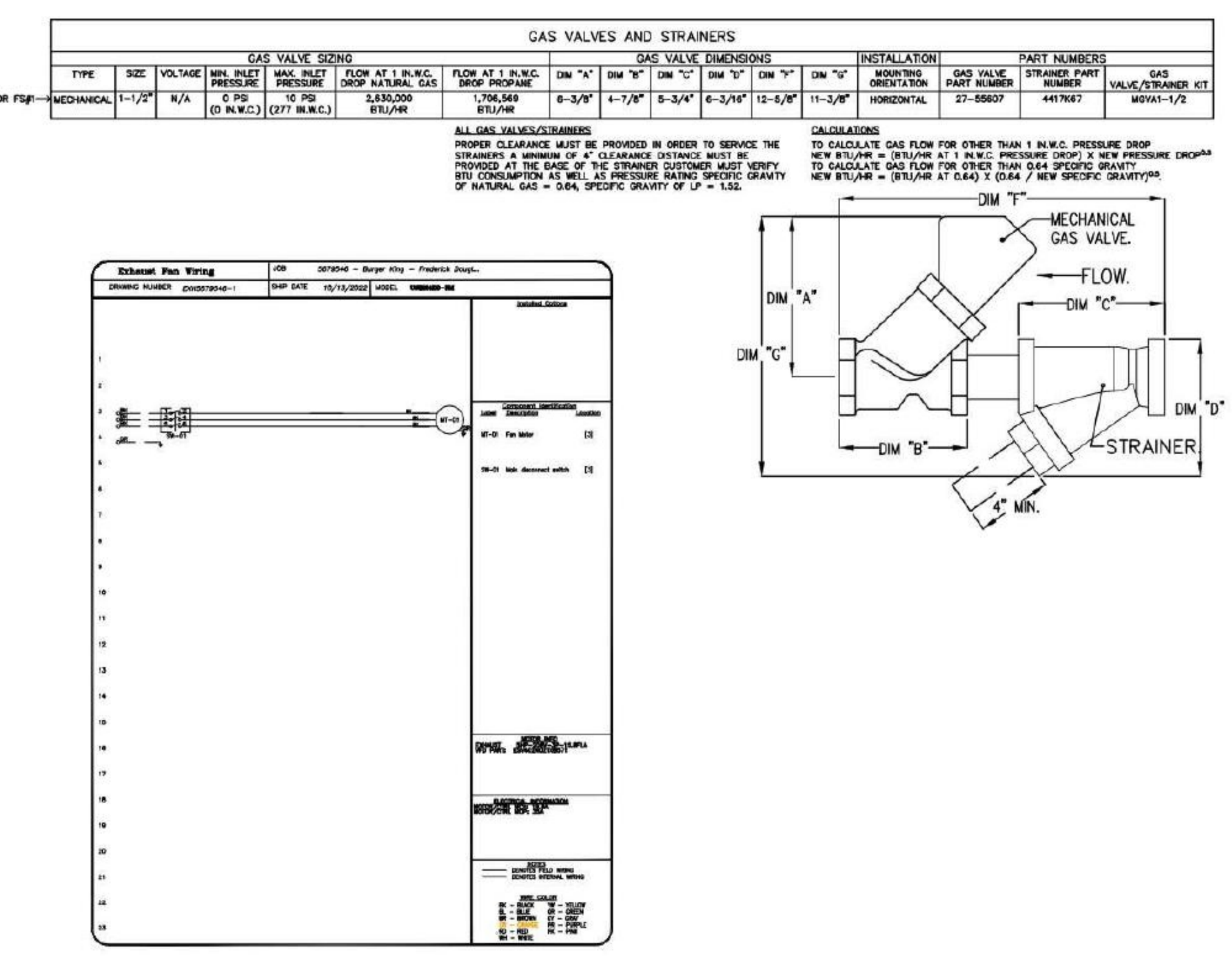
FIRE SYSTEM NO	TAG	TYPE	SIZE	FLOW POINTS	INSTALLATION SYSTEM	LOCATION ON HOOD
1		ANSUL R102	3.0/3.0	18	FIRE CABINET LEFT	LEFT, HOOD 1

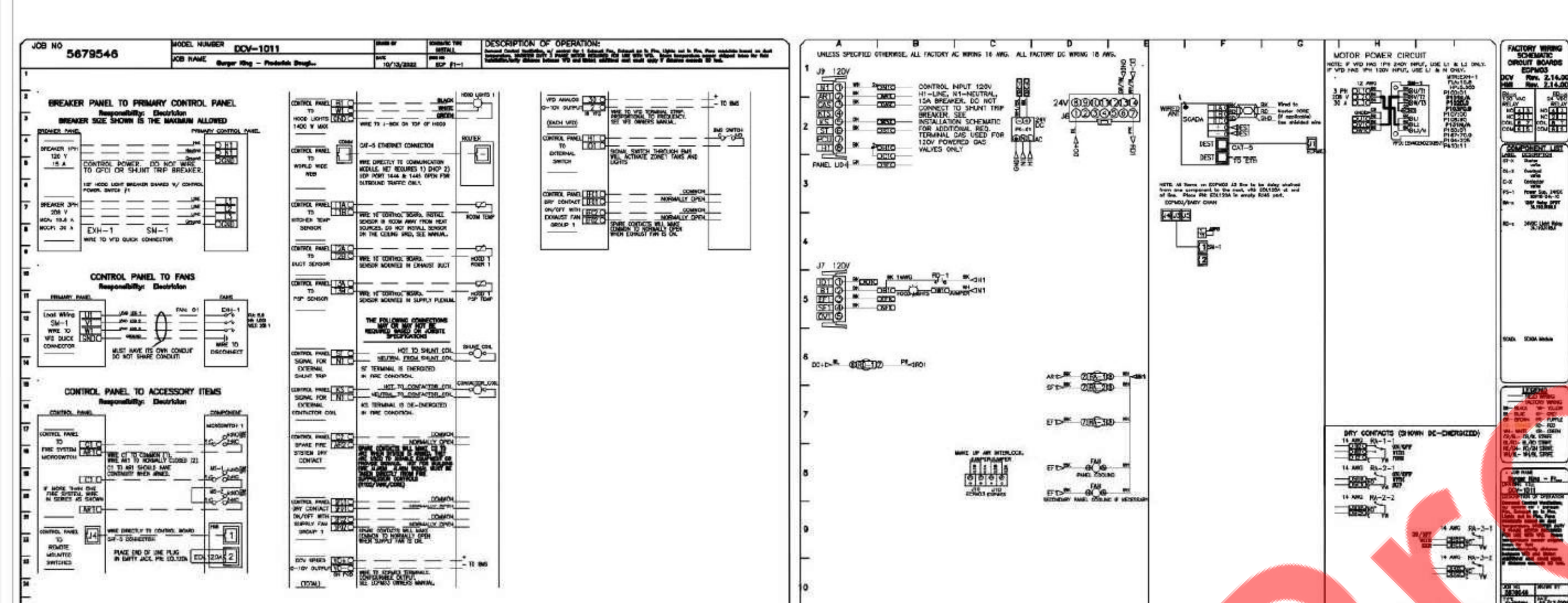
GAS VALVE(S)

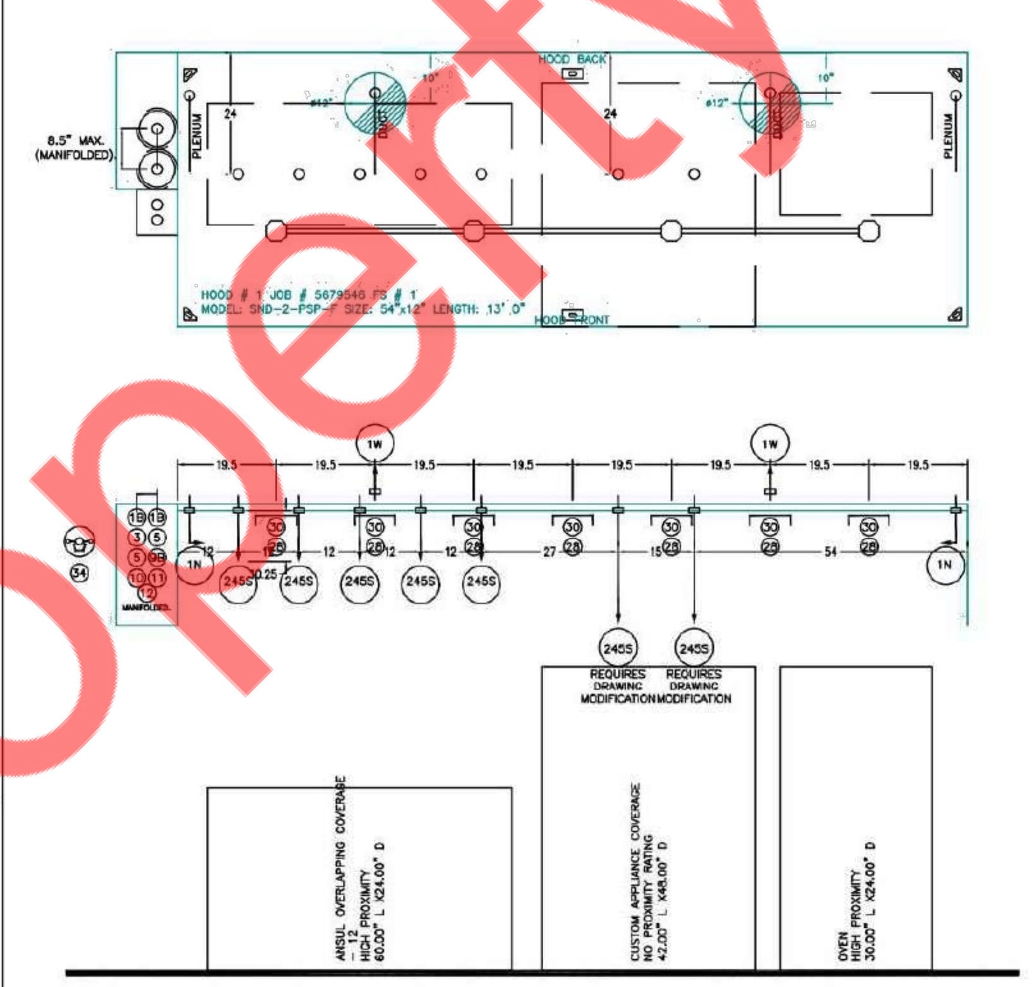
FIRE SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		MECHANICAL	1.500	FRANKE

FIRE SYSTEM PARTS LIST KEY

FIRE SYSTEM NO	TAG	KEY NUMBER – PART DESCRIPTION	QTY BY FACTORY	QTY BY DIST
1		0 – 0 – 43-15733 AIR CYLINDER ASSEMBLY – AIR CYLINDER AND TUBING FOR MECHANICAL GAS VALVES (ANSUL PART #15733).	1	0
		0 – 0 – 439861 LARGE BLOWOFF CAP, METAL, TO FIT NEW LASER-ETCHED ANSUL NOZZLES, A0024201.	11	0
		0 – 0 – DISC UNION BURSTING DISC UNION ASSEMBLY FOR MANIFOLD SYSTEM.	1	0
		0 – 0 – TANK STRAP TANK STRAP – USED FOR ANSUL TANKS.	2	0
		0 – 0 – UCTANKBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINETS.	2	0
		1 – 1 – AT – 3.0 TANK(#1B) – 3.0 GALLON SS TANK (FOR USE WITH AUTOMAN RELEASE, ACTUATOR, OR SS ENCLOSURE (UL/ULC)) MACOLA # 01-429862.	2	0
		3 – 3 – ANS-OEM REGULATED RELEASE – ANSUL REGULATED MECHANICAL RELEASE/BRACKET ASSEMBLY, OEM, R-102, CARTRIDGE DETECTION INCLUDED, ANSUL PART # 79493.	1	0
		5 – 5 – LIQ-3.0 AGENT – ANSULEX LOW PH WET CHEMICAL AGENT, 3 GALLON (UL) 79372.	0	2
		9 – 9 – DT-CART DOUBLE TANK NITROGEN CARTRIDGE.	0	1
		10 – 10 – TLINK LINK – TEST LINK (1 TEST LINK) ANSUL PART # 24916, MACOLA # 20-24916.	0	1
		11 – 11 – MICRO-SDA MICROSWITCH KIT- INCLUDES 2 SWITCHES AND MOUNTING HARDWARE. SINGLE DUAL ELECTRIC SWITCH, ONE STANDARD SWITCH, ONE ALARM DUTY SWITCH ANSUL PART # 437155, MACOLA # 08-437155.	1	0
		12 – 12 – HOSE HOSE – RUBBER HOSE.	1	0
		14 – 14 – 419336 NOZZLE – 1W NOZZLE, DUCT/APPLIANCE (REPLACES ANSUL PART# 419347, CAS PART# 419336) A0001266.	2	0
		16 – 16 – 419335 NOZZLE – 1N NOZZLE, PLENUM/APPLIANCE (REPLACES ANSUL PART# 419346, CAS PART# 419335) A0001265.	2	0
		20 – 20 – 419340 NOZZLE – 245 NOZZLE, APPLIANCE (REPLACES ANSUL PART# 419351, PART# 419340) A0001270.	7	0
		25 – 25 – 418569 NOZZLE ADAPTOR – SWIVEL NOZZLE ADAPTOR (REPLACES CAS PART # 418569) A0001274.	7	0
		26 – 26 – QSA-3/8 QUIK SEAL – 3/8" (UL).	11	0
		27 – 27 – QPSA-1/2 PULLEY SEAL – 1/2" HOOD SEAL (UL) ANSUL PART # 423253, MACOLA # 32-79768.	1	0
		28 – 28 – S-DET DETECTOR – SERIES (SCISSOR LINKAGE) ANSUL PART # 435547/435548 (OLD # 417369/434480); MACOLA # 05-417369.	7	0
		30 – 30 – ANS-500FL FUSIBLE LINK – 500DEG F, R-102 AND PIRANHA, ANSUL PART # 439232.	7	0
		34 – 34 – RPS-A REMOTE PULL STATION – RED COMPOSITE (WITHOUT WIRE ROPE) 434618 (OLD MACOLA #06-4835).	1	0
		35 – 35 – PE-LT PULLEY ELBOW – LOW TEMP. PULLEY ELBOW, SET SCREW TYPE ANSUL PART # 415670, MACOLA # 11-415671.	2	0
		36 – 36 – PE-HT PULLEY ELBOW – HIGH TEMP PULLEY ELBOW, COMPRESSION TYPE, ANSUL PART # 423251, MACOLA # 10-45771.	1	0







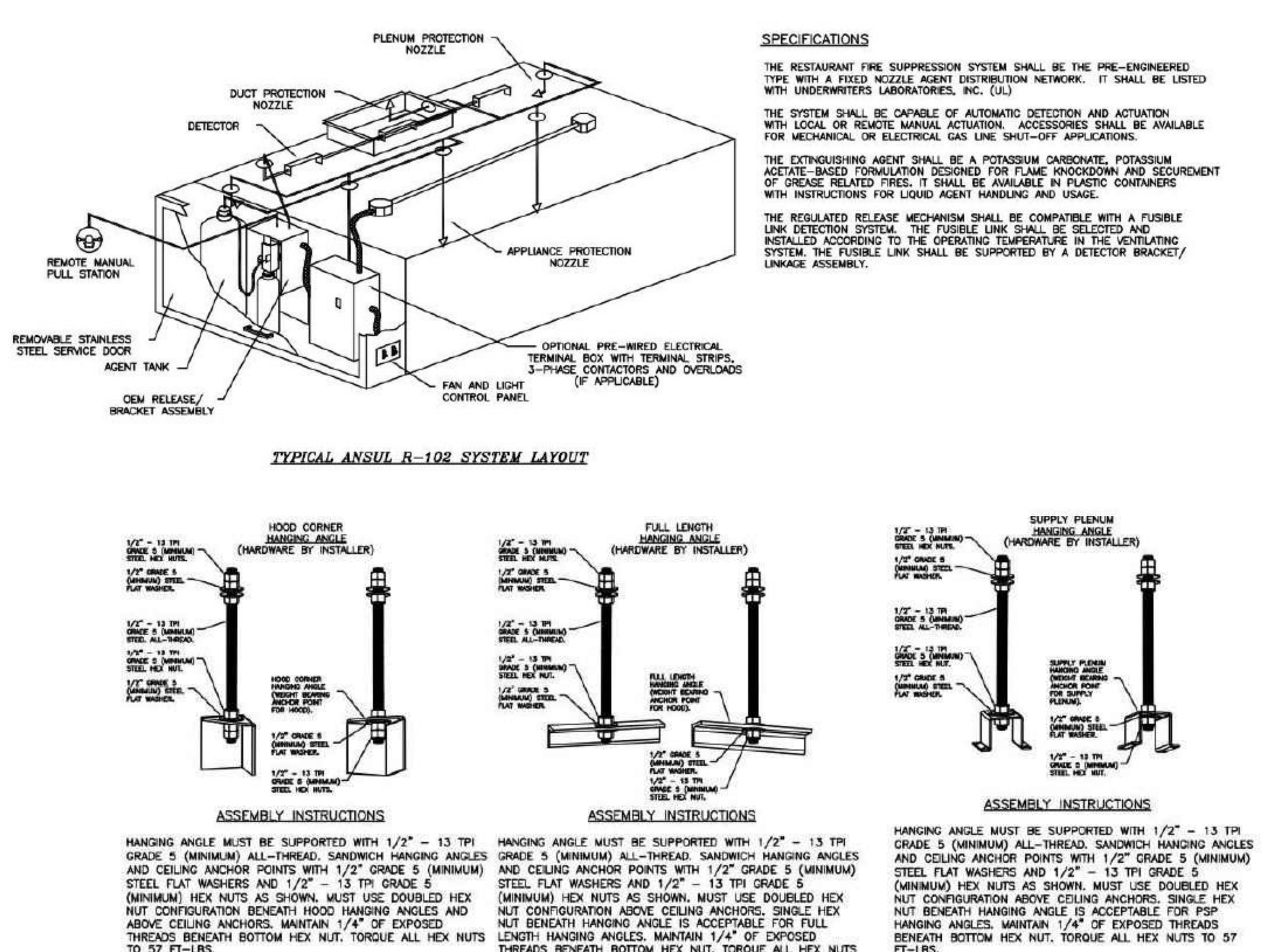
NOTES
- FIELD PIPE DROPS AS SHOWN
  SLEEVING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- FIELD INSTALLED DROP: FACTORY WILL PROVIDE QTY 1 60IN LONG PIECE OF CHROME PLATED PIPING SHIPPED LOOSE TO BE FIELD-INSTALLED.
- SHIP LOOSE DROP: FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED SHIPPED LOOSE TO BE FIELD-INSTALLED.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- MAXIMUM 9 ELBOWS IN SUPPLY LINE.
- MINIMUM 72 INCHES OF AGENT LINE FROM TANK TO FIRST NOZZLE COVERING A RANGE, FRYER, OR WOK TO REFLECT GENERAL PIPING REQUIREMENTS.
- IF APPLICABLE, PRE-PIPED CHARBROILER DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.
- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.
- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

JOB #: 5679546.
JOB NAME: BURGER KING – FREDERICK DOUGLASS BLVD NYC.

SYSTEM SIZE: ANSUL-3.0/3.0-MANIFOLD TOTAL FP REQUIRED: 18.
HOOD # 1 13' 0.00" LONG x 54" WIDE x 12" HIGH.
RISER # 1 SIZE: 12" DIA.
RISER # 2 SIZE: 12" DIA.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

LEGEND – FIRE CABINET ANSUL SYSTEM

1A	1.5 GALLON TANK.
1B	3 GALLON TANK.
2	OEM AUTOMAN RELEASE.
3	OEM REGULATED RELEASE.
4	OEM REGULATED ACTUATOR.
5	ANSULEX LIQUID AGENT (3 GAL.).
6	ANSULEX LIQUID AGENT (1.5 GAL.).
7	CARTRIDGE (101-20).
8	CARTRIDGE (101-10).
9	CARTRIDGE (101-30).
9A	CARTRIDGE (LT-A-101-30).
9B	DOUBLE TANK CARTRIDGE.
10	TEST LINK.
11	DOUBLE MICROSWITCH.
12	HOSE ASSEMBLY.
1100	DUCT NOZZLE (430913).
2W	DUCT NOZZLE (419337).
1W	NOZZLE ASSEMBLY (419336).
1F	NOZZLE ASSEMBLY (419333).
1N	NOZZLE ASSEMBLY (419335).
1/2N	NOZZLE ASSEMBLY (419334).
3N	NOZZLE ASSEMBLY (419338).
245	NOZZLE ASSEMBLY (419340).
230	NOZZLE ASSEMBLY (419339).
2120	NOZZLE ASSEMBLY (419343).
290	NOZZLE ASSEMBLY (419342).
260	NOZZLE ASSEMBLY (419341).
28	DETECTOR BRACKET.
29	LOW TEMP FUSIBLE LINK.
30	HIGH TEMP FUSIBLE LINK.
MGV	MECHANICAL GAS VALVE.
EGV	ELECTRICAL GAS VALVE.
34	REMOTE MANUAL PULL STATION.
S	SWIVEL ADAPTOR.



REV	DATE	DESCRIPTION	BY
A	10/19/2022	INITIAL ISSUE	HP033

Make it wonderful

FRANKE

Franke Foodservice Systems Americas, Inc.
800 Aviation Parkway
Smyrna, TN 37167
Tel. +800 472-2954
fs-customerservice.us@franke.com
www.frankesupply.com

SHEET NAME
K4.1
REVISION
A

ELECTRICAL SYMBOLS LIST

SWITCHES AND CONTROLS

$\$_a$	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
$\$^2_a$	20A 3–WAY TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED
$\$^3_a$	20A 4–WAY TOGGLE SWITCH U.N.O. "a" DENOTES LIGHTING FIXTURE CONTROLLED
$\$^0_a$	WALL BOX DIMMER SWITCH, LUTHRON MAESTRO SERIES. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
$\$_{OV}$	OVERRIDE SWITCH
OS	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.
▬	ASCO CONTACTOR C–25 TORK TIMER T–25 STACKED.
D	DOOR SWITCH
PC	PHOTOCELL IN NEMA 3R ENCLOSURE
PC	WALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.
OS	CEILING OCCUPANCY SENSOR
DS	CEILING MOUNTED DAYLIGHT SENSOR.

WIRING SYSTEMS

3 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
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.
——o	CONDUIT TURNING UP, SEE FLOOR PLANS FOR CONDITIONS.
——●	CONDUIT TURNING DOWN, SEE FLOOR PLANS FOR CONDITION.
	CONDUIT AND WIRE TO BUILDING GROUND.
———	UNDERGROUND
– – – –	EXISTING
———	NEW
S	CEILING MOUNTED SMOKE DETECTOR.
S/CO	COMBINATION OF SMOKE AND CO DETECTOR.

ELECTRICAL DRAWING LIST

E–001.00	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
E–002.00	ELECTRICAL SPECIFICATIONS (1 OF 2)
E–003.00	ELECTRICAL SPECIFICATIONS (2 OF 2)
E–101.00	ELECTRICAL LIGHTING PLAN
E–201.00	ELECTRICAL POWER PLAN
E–202.00	ELECTRICAL ROUGH–IN PLAN
E–301.00	ELECTRICAL DETAILS
E–401.00	ELECTRICAL PANEL SCHEDULES AND RISER DIAGRAM
E–501.00	TECHNOLOGY PLAN
E–601.00	MASTER CONTACTOR PANEL DETAILS

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR.
J	JUNCTION BOX WITH BLANK COVER PLATE, WALL MOUNTE, +18" AFF OR AS NOTED.
J	JUNCTION BOX WITH BLANK COVER PLATE, CEILING MOUNTED..
	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
	DUPLEX DEDICATED RECEPTACLE, +18" AFF OR AS NOTED.
CL	DUPLEX CONVENIENCE RECEPTACLE – 20A–1P, 125V, NEMA 5–20R MOUNTED FLUSH IN CELING.
GFI	DUPLEX RECEPTACLE WITH GFCI PROTECTION
	ELECTRICAL FLOOR BOX
	SPECIAL RECEPTACLE
NID	NETWORK INTERFACE DEVICE. NID IS 'ONT' BOX WHICH INCLUDES BOTH 'ONT' AND ITS SISTER BOX AS PER VERIZON STANDARDS.
	DOUBLE DUPLEX RECEPTACLE – 20A–1P, 125V, NEMA 5–20R.
	TELEPHONE/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.
	DATA OUTLET – (1) PORT UNO, +18" AFF, UNO TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH 1 1/4" DIAMETER GROMMETED OPENING.
	SIMPLEX RECEPTACLE

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.
NF	NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.
A	40A NON FUSED DISCONNECT SWITCH
B	50A NON FUSED DISCONNECT SWITCH
C	100A NON FUSED DISCONNECT SWITCH
D	200A NON FUSED DISCONNECT SWITCH
	COMBINATION MAGNETIC STARTER AND DISCONNECT SWITCH, FURNISHED BY HVAC/CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.
400 350	FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.
	COMBINATION SOLID–STATE MOTOR STARTER.
M	MOTORIZED DAMPER
FSD	FIRE SMOKE DAMPER
M M	DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.
S_T	THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.
S_M	MANUAL MOTOR SWITCH
1.5 kW	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
X	KEYED NOTE REFERENCE
1 E–201	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

POWER DISTRIBUTION

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

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
AT	AMP TRIP	ER	EXISTING TO BE RELOCATED
ATS	AUTOMATIC TRANSFER SWITCH	ETR	EXISTING TO REMAIN
AUTO	AUTOMATIC	EWF	ELECTRIFIED WORKSTATION FURNITURE
AWG	AMERICAN WIRE GAUGE	EWH	ELECTRIC WATER HEATER
C	CONDUIT	FA	FIRE ALARM
C/B,CB	CIRCUIT BREAKER	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
CKT	CIRCUIT	FDR	FEEDER
CLG	CEILING	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
COMM	COMMUNICATION	FIXT	FIXTURE
CT	CURRENT TRANSFORMER	FL	FLOOR
CU	COPPER	FLUOR	FLUORESCENT
°C	DEGREE CELSIUS	G	GROUND
°F	DEGREE FAHRENHEIT	GFI	GROUND FAULT INTERRUPTER
DIA	DIAMETER	GP	GENERAL PURPOSE
DISC	DISCONNECT	HC	HUNG CEILING
DN	DOWN	HP	HORSEPOWER
DP	DISTRIBUTION PANEL	HWH	HOW WATER HEATER
DWH	DOMESTIC WATER HEATER	HZ	HERTZ
DWG	DRAWING	IC	INTERRUPTING CAPACITY
JB	JUNCTION BOX	PP	POWER PANEL
KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE
KV	KILOVOLT	PWR	POWER
KVA	KILOVOLT–AMPERES	R	REMOVE
KW	KILOWATTS	RE	RELOCATED EXISTING
LP	LIGHTING PANEL	REC	RECEPTACLE
LTG	LIGHTING	RGS	RIGID GALVANIZED STEEL
MAX	MAXIMUM	RR	REMOVE & RELOCATE
MC	MOTOR CONTROLLER	SECT	SECTION
MCB	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW
MER	MECHANICAL EQUIPMENT ROOM	SPST	SINGLE POLE SINGLE THROW
MIN	MINIMUM	SPEC	SPECIFICATION
MLO	MAIN LUGS ONLY	SW	SWITCH
MTD	MOUNTED	SWBD	SWITCHBOARD
MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL
N	NEUTRAL	SYS	SYSTEMS
NE	NEW DEVICE TO REPLACE EXISTING	TELE	TELEPHONE
NIC	NOT IN CONTRACT	TEMP	TEMPERATURE
NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN
NTS	NOT TO SCALE	TYP	TYPICAL
OC	ON CENTER	UON	UNLESS OTHERWISE NOTED
P	POLES	V	VOLT/VOLTAGE
PB	PULLBOX	VA	VOLT AMPERE
PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME
ø	PHASE	VFD	VARIABLE FREQUENCY DRIVE
PNL	PANEL	VP	VAPORPROOF
W	WATT	WP	WEATHER PROOF
W	WIRE	XFMR	TRANSFORMER
WH	WALL HEATER	ZRT	ZONE REGISTER TERMINALS
E	EXISTING	IG	ISOLATED GROUND

GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRIC CODE(NEC), WITH NYC AMENDMENTS, 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. SUPPORTRACEWAY 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 PROVIDED 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 CONCEALED 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 WITH 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 LOACTIONS 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.

APPLICABLE CODES

a. 2022 NYC BUILDING CODE.
b. 2022 NYC MECHANICAL CODE.
c. 2022 NYC PLUMBING CODE.
d. 2011 NYC ELECTRICAL CODE. (NEC).
e. 2022 NYC FUEL GAS CODE.
f. 2020 NYC ENERGY CONSERVATION CODE
g. 2016 NFPA 13.

PROJECT COORDINATION NOTES

1. BIDDERS ARE TO VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS AND SATISFY THEMSELVES AS TO THE NATURE AND SCOPE OF WORK. THE SUBMISSION OF A BID WILL BE EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED, OR FOR DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD AN EXAMINATION BEEN MADE, WILL NOT BE ALLOWED.
2. COORDINATE WITH OTHER TRADES FOR ITEMS IN THEIR SCOPE OF WORK WHICH WOULD REQUIRE ELECTRICAL WORK (DISCONNECTION/RECONNECTION, ETC.) AND ARE NOT INDICATED ON THE ELECTRICAL PLANS.

ENERGY CONSERVATION CODE OF NEW YORK CITY COMPLIANCE

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CODE OF NEW YORK CITY 2020

SYSTEMS COMMISSIONING PURSUANT TO SECTION C408.3 NYC ECC 2020

SYSTEMS REQUIRING COMMISSIONING

1– OCCUPANT SENSOR CONTROLS.
2– TIMER SWITCH CONTROLS.

ELECTRICAL SPECIFICATIONS

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT, 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. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOROPERATION,MAINTANANCE AND REPAIR, MINOR DEVIATIONS FROM DRAWING MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

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

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

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

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

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

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

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT 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.

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

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

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

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

P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, 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 THE NATIONAL ELECTRICAL CODE (NEC), AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER 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 PROVIDE 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 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) 120/240 VOLTS, 225–AMP FRAME: 22,000 AMPS MINIMUM

8. DISTRIBUTION PANELBOARDS, CIRCUIT BREAKER TYPE:

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

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

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

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

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

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

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

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

I. MINIMUM GUTTER SPACES: PANELS WITH 225 AMPERE MAINS, 5–½" MINIMUM, 400 AMPERES AND OVER, MINIMUM GUTTERS 8". FOR PANELS WITH THROUGH FEEDERS, INCREASE GUTTER WIDTH BY 2" MINIMUM AND PROVIDE A SHEET STEEL BARRIER BETWEEN THE PANEL GUTTER AND THE THROUGH FEEDER PORTION OF THE BACK BOX. BRANCH CIRCUIT BREAKERS SHALL BE MECHANICALLY INTERLOCKED WHEN SHOWN ON DRAWINGS.

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

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

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

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.

ELECTRICAL SPECIFICATIONS (CONT.)

3. BOXES:

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.

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. OVIDE 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 MANUFACTURED 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).PR

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

F. 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, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3–WAY) AND A5624 (4–WAY).

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

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

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

E. COLORS: COORDINATE COLORS WITH ARCHITECT.

F. 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. 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 (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.

14. PANELBOARDS:

A. PANELBOARDS SHALL BE OF THE DEAD FRONT TYPE MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYED ALIKE.

B. CIRCUIT BREAKERS SHALL BE OF THE BOLT–ON THERMAL MAGNETIC MOLDED CASE TYPE, AND SHALL HAVE THE TRIP RATINGS AND NUMBER OF POLES SHOWN IN SCHEDULES ON THE CONTRACT DRAWINGS. FOR BLANK (SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5–3/4". SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NEUTRAL BUS AND INCREASE NEUTRAL BUS INDICATED.

C. LOCKING TABS SHALL BE PROVIDED ON ALL CIRCUIT BREAKERS SERVING EMERGENCY LIGHTING, FIRE ALARM SYSTEM, SECURITY SYSTEMS AND OTHER EMERGENCY OR CRITICAL EQUIPMENT AND AS NOTED ON THE CONTRACT DRAWINGS. A TOTAL OF 5 SPARE LOCKING TABS SHALL BE FURNISHED TO THE OWNER.

D. BUSES SHALL BE HARD DRAWN COPPER OF 98 PERCENT CONDUCTIVITY AND SHALL HAVE CROSS SECTIONAL AREAS LARGE ENOUGH TO LIMIT THE TEMPERATURE RISE, WHEN CARRYING FULL LOAD, TO 35 DEGREES C. ABOVE AN AMBIENT INSIDE THE ENCLOSURE OF 55 DEGREES C. AS DEFINED IN IEEE STANDARD RULES. MAIN BUS CAPACITY SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.

E. ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED DOOR–IN–DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.

F. DISTRIBUTION AND SUB–DISTRIBUTION PANELBOARD SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

G. ALL STANDARD PANELBOARDS SHALL BE A MINIMUM OF 20" WIDE AND 5 3/4" DEEP.

H. FURNISH ALL PANELBOARDS WITH FEED–THRU LUGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

I. ALL NEW PANELBOARDS SHALL BE PROVIDED WITH AN ENGRAVED WHITE CORE LAMACOID NAMEPLATE, WITH 3/4 IN. WHITE LETTERING ON A BLACK BACKGROUND, WITH DESIGNATION LISTED (PANELBOARD NAME), FASTENED WITH EPOXY CEMENT OR OVAL HEAD CHROME PLATED MACHINE SCREWS.

J. THE CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN AND PROVIDED INSIDE EACH PANEL DOOR TO INDICATE EQUIPMENT AND/OR AREA SERVED. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. THE TYPEWRITTEN LIST INDICATING CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.

K. TIE–BARS SHALL NOT BE USED TO CREATE MULTI–POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED.

L. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG.

M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN. WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO CASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 208Y/120 VOLT SYSTEM AND 14,000 AMPERES R.M.S. SYMMETRICAL FOR 480Y/277 VOLT SYSTEM. SERIES RATED PANELBOARDS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

N. FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.

15. SMOKE ALARMS

A. PROVIDE SOLID STATE, PHOTOELECTRIC TYPE, HARD–WIRED SMOKE ALARM WITH 9V BATTERY BACKUP AND INTEGRAL TEMPORAL PATTER EVACUATION HORN. EDWARDS 517 SERIES OR APPROVED EQUAL.

B. THREE POSITION TEST FEATURE THAT SIMULATES ACTUAL SMOKE CONDITIONS. SHALL CONTAIN MAINTENANCE INDICATOR.

C. PROVIDE WITH INTEGRAL 135 DEGREE F ISOLATED HEAT DETECTION OR INTEGRAL RELAY RATED 0.6A AT 125V AC., AS INDICATED ON THE PLANS AND DRAWINGS.

D. DEVICE SHALL BE RATED TO OPERATE AT A RANGE OF 40°f TO 100°F.

E. UL LISTED TO UL217 AND APPROVED.

16. INTERCOM CONDUIT SYSTEM:

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

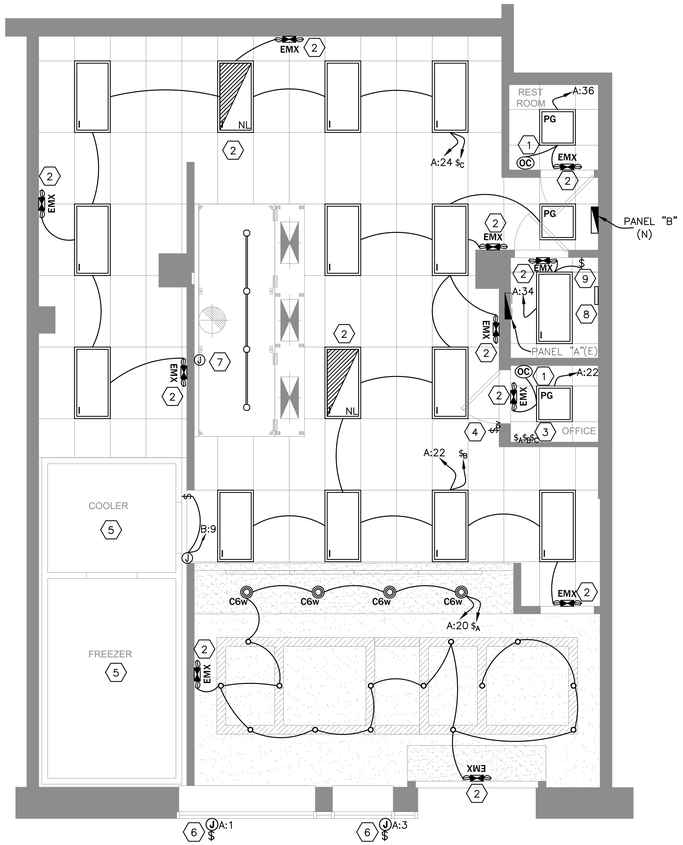
B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF INTERCOM MANUFACTURER.

C. OUTLETS SHALL BE:

1)WALL: 4 IN. SQUARE WITH SINGLE GANG COVER PLATE.

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

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM EACH APARTMENT TO MAIN INTERCOM CONTROLLER AT ENTRANCE.



1 ELECTRICAL LIGHTING PLAN - FIRST FLOOR

1/4"=1'-0"

LIGHTING FIXTURE SCHEDULE					
QTY.	CODE	DESCRIPTION	MANUFACTURER	FIXTURE MODEL NO.	WATTAGE
15	I	2x4 LED FLAT PANEL 5,000 LUMEN -4000K	CREE	C-TR-FP24-50L-40K-WH	50
3	PG	2x2LED FLAT PANEL 3,100 LUMEN -4000K	CREE	C-TR-FP22-31L-40K-WH	37
4	C6w	6" LED RETROFIT DOWNLIGHT	CREE	CR6T-1100L-27K-12-E26GU24	14.5
14	G	2" RECESSED LED ROUND DOWNLIGHT	JUNO	SP34378B-9-F1-SSN	10.1
9	EMX	C-LITE LED EXIT & EMERGENCY LIGHT COMBO	CREE	C-EE-A-EX-2LDF-RED-BB	3

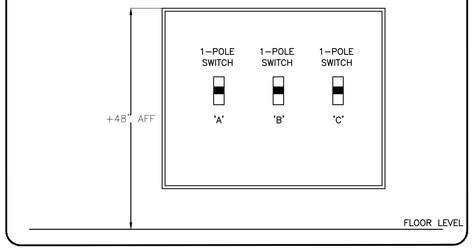
CIRCUIT NUMBER NAMING:

INDICATES PANEL NAME — A:B — INDICATES CIRCUIT NO.

LIGHTING PLAN KEYED WORK NOTES:

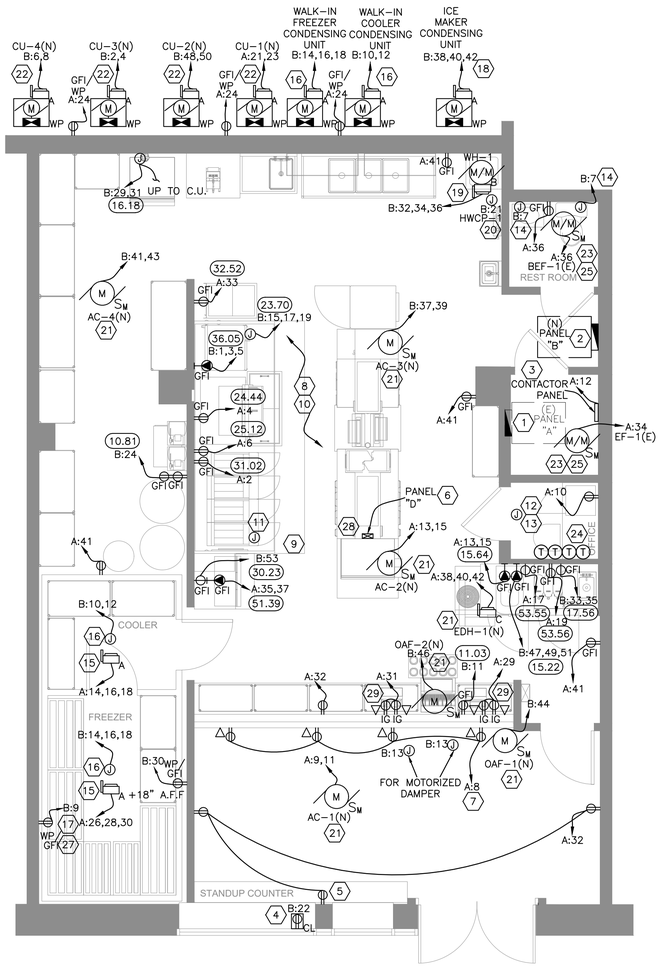
1. WALL MOUNTED OCCUPANCY SENSOR. E.C. TO COORDINATE EXACT LOCATION OF OCCUPANCY SENSOR WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN
2. CONNECT ALL EMERGENCY EGRESS AND NIGHT LIGHTING FIXTURES TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES
3. LOCATION OF LIGHTING SWITCH BANK. REFER TO SWITCH BANK ELEVATION ON SHEET E-101.00 FOR ADDITIONAL INFORMATION.
4. TIME CLOCK OVERRIDE SWITCH.
5. WALK-IN FREEZER/COOLER LIGHT FIXTURE & OCCUPANCY SENSOR SHALL BE PROVIDED BY WALK-IN FREEZER/COOLER MANUFACTURER. E.C. TO PROVIDE ELECTRICAL CONNECTION TO WALK-IN FREEZER/COOLER LIGHTING.
6. PROVIDE WEATHERPROOF JUNCTION BOX AND TOGGLE TYPE 20A-1P DISCONNECT SWITCH IN AN ACCESSIBLE LOCATION FOR SIGNAGE. COORDINATE EXACT REQUIREMENTS WITH SIGN CONTRACTOR. VERIFY LOCATION PRIOR TO ROUGH-IN.
7. JUNCTION BOX ON HOOD FOR CONNECTION TO PRE-WIRED HOOD LIGHTS. CONNECT TO KITCHEN LIGHTING CIRCUIT. E.C. TO COORDINATE EXACT POWER REQUIREMENT WITH HOOD MANUFACTURER AND MAKE POWER PROVISION ACCORDINGLY.
8. PROPOSED LOCATION OF MASTER CONTRACTOR PANEL. E.C. TO VERIFY THE FINAL LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN. REFER SHEET E-601.00 FOR WIRING DIAGRAM.
9. MANUAL SWITCH. AS PER IECC C405.2, LIGHTING CONTROLS ARE NOT REQUIRED IN EECTRICAL ROOM.

SWITCH BANK DETAIL :



LIGHTING PLAN GENERAL NOTES:

1. REFER TO DWG. E-001 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E-002 & E-003 FOR ELECTRICAL SPECIFICATIONS.
2. E.C. SHALL COORDINATE WITH ARCHITECT FOR LIGHT FIXTURE DESCRIPTION, HEIGHTS AND LOCATION PRIOR TO ROUGH-IN.
3. E.C. TO COORDINATE WITH ARCHITECT FOR EXACT LIGHTING CONTROL AND DIMMING REQUIREMENTS FOR ALL THE LIGHTING FIXTURES.
4. ALL WORK AND MATERIALS SHALL BE BY THE ALL WORK AND MATERIALS SHALL BE BY THE ELECTRICAL CONTRACTOR UNLESS NOTED OTHERWISE.
5. MC CABLE ONLY PERMITTED FOR LIGHT WHIPS. MC CABLE ONLY PERMITTED FOR LIGHT WHIPS,ALL OTHER TO BE E.M.T CONDUIT IN CEILING AND WALLS – RIGID CONDUIT UNDER SLAB.
6. PROVIDE JUNCTION BOXES AT LIGHT FIXTURES PER MANUFACTURERS REQUIREMENTS. (TYPICAL FOR ALL LIGHTING FIXTURES).
7. WHERE TRUSSES ARE EXPOSED, RUN ALL WHERE TRUSSES ARE EXPOSED, RUN ALL ELECTRICAL CONDUITS ABOVE THE BOTTOM CHORD OF THE TRUSS.
8. E.C. SHALL COORDINATE FINAL FIXTURE MAKE AND MODEL WITH ARCHITECT.
9. ALL EMERGENCY LIGHTS, NIGHT LAMPS AND EXIST LIGHTS SHALL BE CONNECTED TO NEAREST LIGHTING CIRCUIT IN THE AREA AHEAD OF ALL LIGHTING CONTROL MEANS IN ORDER TO BE ENERGIZED AT ALL TIME.
10. E.C. SHALL PROVIDE ADDITIONAL LIGHTING CONTROLS AS PER AHJ REQUIREMENTS IF ANY TO COMPLETE THE PERMIT REQUIREMENTS.
11. REFER TO REFLECTED CEILING PLAN IN ARCHITECTURAL DRAWINGS FOR MORE INFORMATION ON COLORS AND TRIMS REQUIRED.
12. E.C. SHALL RECEIVE APPROVAL FROM ARCHITECT/ OWNER FOR LIGHTING FIXTURE SELECTIONS BEFORE PURCHASE AND INSTALLATION.
13. ALL DIMMING SWITCHES SHALL BE 0-10V.
14. ALL LIGHT FIXTURES OVER FOOD SERVICE AREA TO BE PROVIDED WITH LENS.
15. ALL THE LIGHTING CONTROLS SHALL BE AS PER C405.2.



1 ELECTRICAL POWER PLAN - FIRST FLOOR

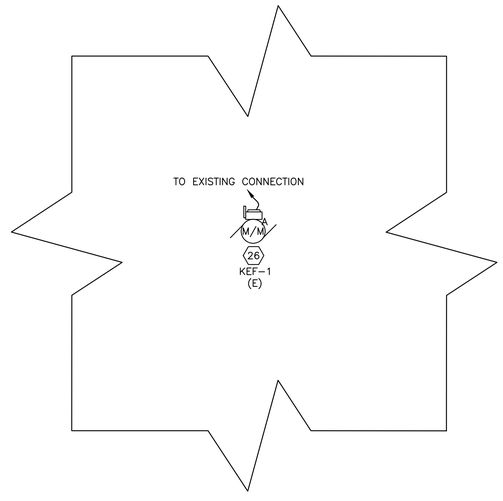
1/4"=1'-0"

POWER PLAN KEYED WORK NOTES:

1. EXISTING 200A, 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A" SHALL REMAIN FOR THE PROJECT SPACE. E.C. SHALL VERIFY THE OPERABLE CONDITION OF EXISTING PANELS. INFORM ENGINEER FOR ANY DISCREPANCY FOUND PRIOR TO BID.
2. NEW 400A, 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT IN FIELD.
3. PROPOSED LOCATION OF MASTER CONTACTOR PANEL. REFER SHEET E-601.00. E.C. TO VERIFY THE FINAL LOCATION WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
4. SHOW WINDOW RECEPTACLE. E.C. TO PROVIDE SHOW WINDOW RECEPTACLES AS PER NEC 210.62.
5. PROVIDE DUPLEX RECEPTACLES WITH TWO USB CHARGING PORTS. E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
6. PRE-WIRED BRANCH CIRCUIT DISCONNECTED FOR SHIPMENT TO BE RE-CONNECTED BY E.C. AS PER MANUFACTURES INSTALLATION & SPECIFICATIONS.
7. DIGITAL MENU BOARDS (VERIFY 3 OR 4 INSTALLATIONS) : PROVIDE (1) DUPLEX RECEPTACLE FOR 120V CIRCUIT & (1) P-RING FOR DATA CABLE AT EACH MENU BOARD SCREEN. REFER TO DETAIL SHEET E-501.00
8. E.C. SHALL COORDINATE EQUIPMENT INSTALLATION WITH THE EQUIPMENT MANUFACTURE'S INSTALLATION PERSONNEL.
9. FRYER HOOD : PRE-WIRED (WITH RECEPTACLES BY HOOD MANUFACTURER. ELECTRICAL CONTRACTOR TO MAKE CONNECTION AT JUNCTION BOX AT THE TOP OF THE HOOD. BOILER HOOD : PRE-WIRE (WITH DUPLEX RECEPTACLES) NY HOOD MANUFACTURER. E.C. TO MAKE CONNECTION AT JUNCTION BOX AT THE TOP OF THE HOOD.
10. E.C. TO RUN CONDUIT & WIRE THROUGH THE EQUIPMENT CHASE & CONNECT TO CIRCUIT PROVIDED IN JUNCTION BOX BY EQUIPMENT MANUFACTURER.
11. JUNCTION BOX FOR HOOD/ANSUL SYSTEM. ELECTRICAL CONTRACTOR TO COORDINATE EXACT POWER REQUIREMENT WITH HOOD MANUFACTURER AND MAKE POWER PROVISION ACCORDINGLY.
12. TO MASTER CONTACTOR PANEL. REFER SHEET E-601.00.
13. MANUAL ON-OFF CONTROL PANEL. REFER SHEET E-601.00.
14. JUNCTION BOX FOR SENSORS. EXISTING TO BE REUSED. IF NOT PROVIDE AS SHOWN. ALL RESTROOM FIXTURES TO BE AUTOMATICALLY SENSORED, HAND FREE, TOUCHLESS, CONTACTLESS FIXTURES.
15. ELECTRICAL CONTRACTOR TO COORDINATE EXACT POWER REQUIREMENT WITH WALK IN BOX MANUFACTURER AND MAKE POWER PROVISION ACCORDINGLY.
16. E.C. TO FIELD VERIFY LOCATION OF CONDENSING UNIT WITH OWNER/ARCHITECT AND PROVIDE POWER CONNECTION WITH NECESSARY ELECTRICAL FIXTURES/ DISCONNECTS AS PER MANUFACTURER REQUIREMENTS.
17. E.C. TO PROVIDE FINAL POWER CONNECTION FOR HEAT TAPE AND DOOR HEATER AS PER MANUFACTURER REQUIREMENTS. . HEAT TAPE IS PROVIDED BY THE WALK-IN BOX MANUFACTURER AND INSTALLED BY ELECTRICAL CONTRACTOR. E.C. SHALL COORDINATE INSTALLATION AND SUPPLY 120V CIRCUIT AND RECEPTACLE AS DIRECTED BY BOX MANUFACTURER
18. E.C. SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT WITH EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
19. DISCONNECT FOR ELECTRIC WATER HEATER. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH PLUMBING CONTRACTOR.
20. JUNCTION BOX FOR HWCP PUMP. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH PLUMBING CONTRACTOR.
21. E.C. SHALL COORDINATE FINAL LOCATION OF ALL MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR.
22. E.C. SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
23. EXHAUST FANS SHALL BE CIRCUITED AND CONTROLLED ALONG WITH THE LIGHT FIXTURES IN THE SAME ROOM.
24. E.C. SHALL PROVIDE BACK BOX AND CONDUIT WITH PULL STRING FOR MECHANICAL UNIT. CONFIRM FINAL LOCATION WITH MECHANICAL DRAWING PRIOR TO ROUGH-IN.
25. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR THE ELECTRICAL CONNECTION AND LOCATION OF ALL THE EXISTING HVAC UNITS. E.C. SHALL VERIFY THE OPERABLE CONDITION OF EXISTING ELECTRICAL CONNECTION AND BREAKERS IN FIELD. REPLACE IF FOUND IN OPERABLE, BASE BID ACCORDINGLY.
26. EXISTING 30A DISCONNECT SWITCH TO BE REUSED FOR THE EXHAUST FAN (KEF-1) ON THE ROOF. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATION AND ELECTRICAL REQUIREMENT FOR THE EXHAUST FAN AND VERIFY THE OPERABLE CONDITION OF EXISTING ELECTRICAL CONNECTION, BREAKER AND FEEDER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
27. 6" BELOW CEILING FOR CONDENSATE DRAIN LINE TAPE HEATER.
28. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR CONDUIT ROUTING OF PREP MODULE "A" (ABCD) PRIOR TO ROUGH-IN.
29. REFER TO SHEET E-501 FOR P.O.S. SYSTEMS ELECTRICAL INFORMATION.

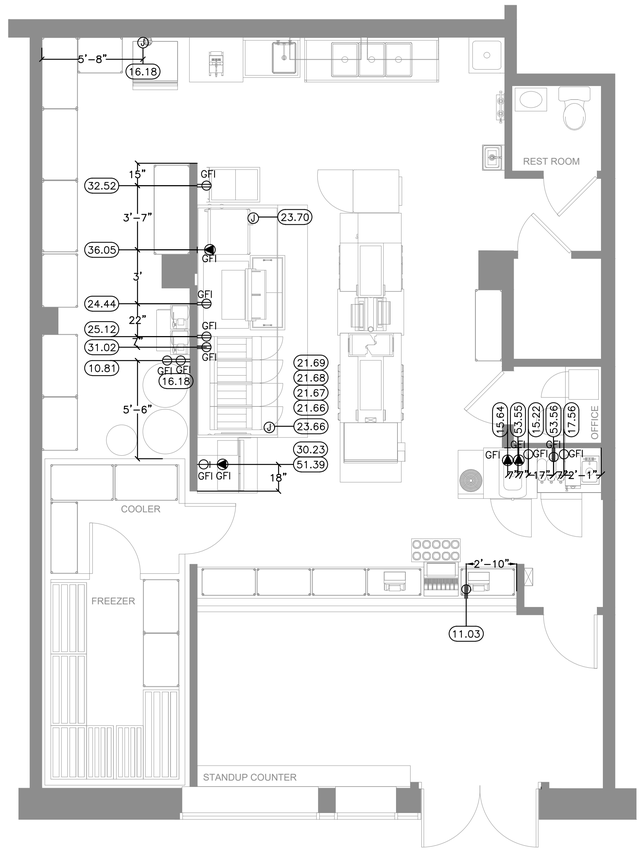
POWER PLAN GENERAL NOTES:

1. VERIFY MOUNTING HEIGHTS OF ALL RECEPTACLES WITH EQUIPMENT SUPPLIED PRIOR TO INSTALLATION.
2. E.C. TO PROVIDE CORD & PLUG CONNECTIONS FOR EQUIPMENT AS REQUIRED.
3. ALL RECEPTACLES IN KITCHEN COOKING AREA,FOOD PREPARATION AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B). PROVIDE GFI RATED BREAKER AT PANEL FOR KITCHEN EQUIPMENT.
4. ALL CIRCUITS FOR P.O.S. (POINT OF SALE) EQUIPMENT SHALL BE CONNECTED TO THE SAME PHASE OF POWER IN THE PANEL. ALL BRANCH CIRCUIT BREAKERS SUPPLYING P.O.S. EQUIPMENT SHALL HAVE LOCKING HANDLES DEVICES.
5. EACH RECEPTACLE TYPE (LOCKING OR STRAIGHT BLADE) SHALL MATCH THAT OF THE EQUIPMENT FURNISHED.
6. ALL RECEPTACLES WITHIN 6 FEET FROM THE TOP INSIDE EDGE OF THE BOWL OF THE SINK SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B)
7. ALL POS AND COMPUTERS TO HAVE ISOLATED GROUND.
8. ALL EMPTY CONDUITS TO BE PROVIDED WITH NYLON PULL STRING. ALL EMPTY CONDUITS TO BE PROVIDED WITH NYLON PULL STRING.
9. NEW TYPEWRITTEN PANEL DIRECTORY SHALL BE FURNISHED AFTER JOB IS COMPLETED REFLECTING ALL AS NEW TYPEWRITTEN PANEL DIRECTORY SHALL BE FURNISHED AFTER JOB IS COMPLETED REFLECTING ALL AS BUILT CONDITIONS.
10. ALL BRANCH CIRCUITS SHALL BE PROPERLY PHASE BALANCED. ALL BRANCH CIRCUITS SHALL BE PROPERLY PHASE BALANCED.
11. ALL DATA EQUIPMENT TO BE FED BY A DEDICATED CIRCUIT WHICH CONSISTS OF A POWER CIRCUIT THAT ALL DATA EQUIPMENT TO BE FED BY A DEDICATED CIRCUIT WHICH CONSISTS OF A POWER CIRCUIT THAT FEEDS THIS TYPE OF EQUIPMENT ONLY WITH A SEPARATE GREEN GROUNDING CONDUCTOR CARRIED ALL THE WAY BACK TO THE PANEL TO BE CONNECTED TO THE GROUNDING SYSTEM.
12. FUSES SHALL BE DUAL ELEMENT, TIME DELAY TYPE UNLESS OTHERWISE NOTED.
13. EC SHALL VERIFY INTERIOR DECOR THEME TO BE USED AND COORDINATE WITH SAID THEME. EC SHALL VERIFY INTERIOR DECOR THEME TO BE USED AND COORDINATE WITH SAID THEME.
14. EC SHALL INSTALL AND CONNECT WIRING TO ALL SIGNS. EC SHALL INSTALL AND CONNECT WIRING TO ALL SIGNS.
15. EC TO COORDINATED ROUGHING-IN TO ALL EQUIPMENT WITH EQUIPMENT SUPPLIER PRIOR TO INSTALLING EC TO COORDINATED ROUGHING-IN TO ALL EQUIPMENT WITH EQUIPMENT SUPPLIER PRIOR TO INSTALLING CONDUITS.
16. ALL CONDUIT RUNS TO KITCHEN EQUIPMENT SHALL BE RUN ABOVE CEILING.
17. MAINTAIN 12" CLEARANCE BETWEEN P.O.S. COMMUNICATION CONDUITS AND LIGHTING FIXTURES AS WELL AS MAINTAIN 12" CLEARANCE BETWEEN P.O.S. COMMUNICATION CONDUITS AND LIGHTING FIXTURES AS WELL AS POWER CONDUITS.
18. CUTTING AND NOTCHING OF 2x4 BEARING WALL FRAMING NOT TO EXCEED 7/8". BORING HOLES IN 2x4 CUTTING AND NOTCHING OF 2x4 BEARING WALL FRAMING NOT TO EXCEED 7/8". BORING HOLES IN 2x4 BEARING WALL FRAMING NOT TO EXCEED 2 1/8".



2 ELECTRICAL PLAN - PARTIAL ROOF

1/4"=1'-0"



1 **ELECTRICAL ROUGH-IN PLAN - FIRST FLOOR**
1/4"=1'-0"

KITCHEN EQUIPMENT SCHEDULE GENERAL NOTES:

E.C. TO COORDINATE WITH ARCHITECT/ KITCHEN EQUIPMENT SPECIALIST FOR CONNECTION TYPE AND HEIGHT PRIOR TO ROUGH IN.

KITCHEN EQUIPMENT SCHEDULE										
ITEM NO.	QTY	DESCRIPTION	VOLTAGE	PHASE	AMPS	kW	CONN. TYPE	NEMA	CONN. HEIGHT(AFF)	REMARK
10.81	2	CARBONATOR	115	1	6.3	0.72	CORD & PLUG	5-15	78"	
11.31	1	ICE/SODA DISPENSER	115	1	5	0.58	CORD & PLUG	5-15	48"	
15.22	1	SOFT SERVE FREEZER	208	3	13	4.68	CORD & PLUG	6-15	36"	
15.64	1	FROZEN BEVERAGE DISPENSER	208	1	20	4.16	CORD & PLUG	6-15	36"	
16.18	1	ICE MACHINE	208	1	11.4	2.37	DIRECT		48"	
17.56	1	INFUSION TEA COFFE BREWER	208	1	13	2.70	CORD & PLUG	6-15	24"	
20.37	1	41" EXPEDITER STATION STD FLOW	115	1	16	1.84	CORD & PLUG	5-15		CONNECT TO PRE-WIRED TO RECEPTACLE IN PREP MODULE "A" (#21.66) VIA 6' POWER CORD
21.66	1	60" PREP MODULE "A" - (ABCD)	208	3	96	34.54	DIRECT			DOWN THRU SERVICE CHASE; E.C. TO CONNECT TO LOAD CENTER PROVIDED, AS REQ'D FOR 150A- 5 WIRE W/106A FEEDER. AMPERAGE LOAD FOR LOAD CENTER IN THIS CABINET TO BE CALCULATED FROM COMBINED LOADS OF EQUIPMENT ATTACHED TO THIS CABINET.
21.67	1	28" BUN TOASTER MODULE "B"	115	1						CONNECT TO LOAD CENTER ON PREP MODULE "A"
21.68	1	32.5" PREP MODULE "C"	115	1						CONNECT TO LOAD CENTER ON PREP MODULE "A"
21.69	1	20" PREP MODULE "D"	115	1						CONNECT TO LOAD CENTER ON PREP MODULE "A"
23.66	1	156" CANOPY HOOD								E.C. TO CONNECT TO UTILITY CABINET'S ELECTRICAL SYSTEM ON HOOD F/ HOOD'S COMPONENTS & LIGHTS. REFER TO DETAIL SHEET K4.1 FOR INSTALLATION OF HOOD & COMPONENTS
23.7	1	EXHAUST FAN	208	3	15.8	5.69	DIRECT		12"	E.C. TO INTERCONNECT CIRCUIT W/ SAFETY INTERLOCK AT BUILDING'S MAIN BREAKER PANEL. CONNECTION HEIGHT @ 12" B.F.R.
24.44	1	BROILER BK FLAMING HEART	115	1	11	1.27	CORD & PLUG	5-15	24"	
25.12	1	50" MEAT WELL FREEZER	115	1	4.6	0.53	CORD & PLUG	5-15	24"	
30.23	1	EXPEDITOR FORCED AIR FRY STATION-ROC	115	1	16	1.84	CORD & PLUG	5-15	24"	
31.04	4	1 BANK FRYER	115	1	3	0.35	CORD & PLUG	5-15	24"	
32.52	1	PRODUCT HOLDING FREEZER	115	1	4.6	0.53	CORD & PLUG	5-15	24"	
36.05	1	CONVECTION OVEN	208	3	37.7	13.57	CORD & PLUG	6-50	24"	
40.55	1	BEVERAGE REFRIGERATOR	115	1	4.6	0.53	CORD & PLUG	5-15	24"	CONNECT TO RECEPTACLE IN EXPO
40.85	1	REACH-IN FREEZER	115	1	4.4	0.51	CORD & PLUG	5-15		CONNECT TO RECEPTACLE AT MODULE "D" (#21.66)
50.21	2	MICROWAVE	208	1	20	4.16	DIRECT			CONNECT TO RECEPTACLE ON PREP BOARD
51.39	1	MULTI-PRODUCT HOLDING UNIT	208	1	10.4	2.16	CORD & PLUG	6-15	60"	
51.43	2	MULTI-PRODUCT HOLDING UNIT	208	1	15.6	3.24				CONNECT TO RECEPTACLE ON PREP MODULE A & C (#21.66 & #21.68)
53.55	1	REACH-IN UNDERCOUNTER REFRIGERATOR - RH DOOR	115	1	2.2	0.25	CORD & PLUG	5-15	24"	
53.56	1	REACH-IN UNDERCOUNTER REFRIGERATOR - FIELD REVERSIBLE DOOR	115	1	2.2	0.25	CORD & PLUG	5-15	24"	
55.12	2	DUAL CONTINUOUS FEED TOASTER	208	3	8.5	3.06	CORD & PLUG	6-30		CONNECT TO RECEPTACLE ON PREP MODULE B (#21.67)
59.51	1	EGG COOKER	208	1	12.6	2.62	CORD & PLUG	6-15		CONNECT TO RECEPTACLE ON PREP MODULE A & C (#21.66 & #21.68)

ROUGH-IN PLAN GENERAL NOTES:

1. E.C. TO PROVIDE AND INSTALL RECEPTACLES, CAPS AND CORDS AS REQUIRED. CAPS AND CORDS ARE TO BE INSTALLED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
2. E.C. TO CONNECT ELECTRICAL SERVICE DIRECTLY TO EQUIPMENT ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS.
3. E.C. TO RECONNECT ELECTRICAL CIRCUITS ON PRE-WIRED EQUIPMENT DISASSEMBLED FOR SHIPMENT.
4. WHERE EQUIPMENT IS NOT PRE-WIRED, E. C. TO CONNECT THE ELECTRICAL SERVICE AND PROVIDE INTER-WIRING AS REQUIRED.
5. WHERE RECEPTACLES ARE PROVIDED WITH THE EQUIPMENT, E. C. TO PROVIDE AND INSTALL ELECTRICAL SERVICE DOWN FROM ABOVE THROUGH THE SERVICE CHASE PROVIDED WITH THE EQUIPMENT.
6. H&K's DRAWINGS INCLUDE ONLY THOSE RECEPTACLES REQUIRED FOR SPECIFIC KITCHEN EQUIPMENT. REFER TO THE ARCHITECTURAL BUILDING DRAWINGS FOR LOCATIONS OF UTILITY AND GENERAL PURPOSE RECEPTACLES.
7. E. C. TO VERIFY THE UTILITY REQUIREMENTS FOR ITEMS NOT PROVIDED BY H&K.
8. ALL PORTIONS OF WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND NATIONAL CODES, ORDINANCES AND STANDARDS.
9. NOTIFY H&K's PROJECT MANAGER IMMEDIATELY IF COMPLIANCE WITH A LOCAL, STATE OR NATIONAL CODE IS IN CONFLICT WITH THESE DRAWINGS.
10. ELECTRICALLY OPERATED OR HEATED EQUIPMENT SHALL BEAR THE U. L. OR R. U. SEAL.
11. ALL 120V CONTROL WIRING TO BE DONE BY THE E.C.
12. ALL CUSTOM FABRICATION EQUIPMENT WITH FACTORY WIRING SHALL BEAR THE U.L. LABEL AND FILE NO. FOR THE ENTIRE ITEM.
13. EACH DOUBLE CONVENIENCE OUTLET TO BE WIRED TO 20A BREAKER.
14. E. C. TO PROVIDE AND INSTALL A HEATING ELEMENT ON THE COOLER/FREEZER CONDENSATE DRAIN LINES.
15. E. C. TO CONNECT THE PRIMARY ELECTRICAL SERVICE TO THE CONDENSING UNITS AND INTERWIRE TO THE EVAPORATOR COIL(S), CONTROLS, LIGHTING FIXTURES AND DOOR PERIMETER HEATERS.

MANUAL MODE OPERATION:

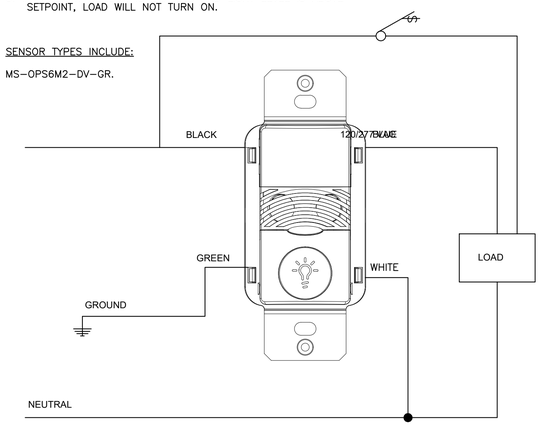
1. PUSHBUTTON PRESS IS REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR BY PRESSING PUSH BUTTON.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

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:

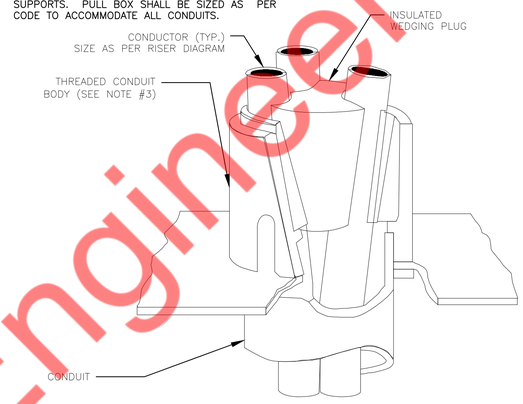
MS-OPS6M2-DV-GR.



1 / E-301 WIRING DIAGRAM-LOW VOLTAGE WALL SWITCH SENSOR (NEUTRAL CONNECTION) OCCUPANCY/VACANCY-SINGLE LEVEL) N.T.S

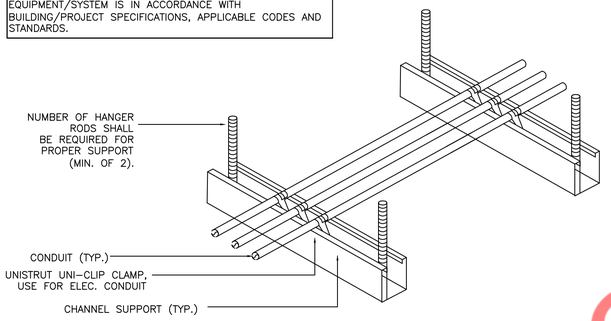
NOTES:

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



2 / E-301 VERTICAL CABLE SUPPORT DETAIL N.T.S

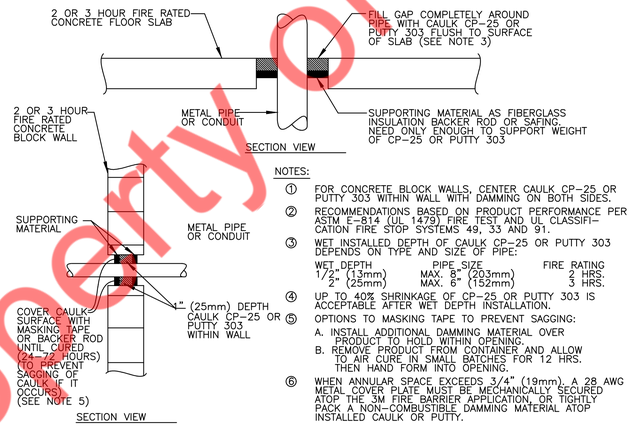
NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT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

3 / E-301 CONDUIT SUPPORT DETAIL N.T.S



NOTES:

① FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.

② RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFICATION FIRE STOP SYSTEMS 49, 33 AND 91.

③ WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:

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

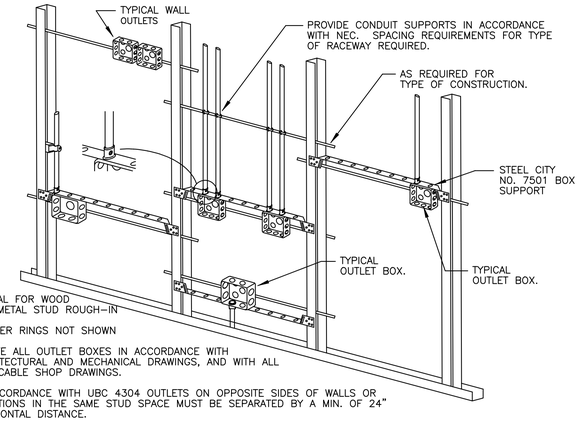
④ UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.

⑤ OPTIONS TO MASKING TAPE TO PREVENT SAGGING:

A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.

⑥ WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm), A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON-COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.

4 / E-301 FIRE STOP DETAIL N.T.S



NOTES:

① TYPICAL FOR WOOD AND METAL STUD ROUGH-IN

② PLASTER RINGS NOT SHOWN

③ LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

④ IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

5 / E-301 DETAIL TYPICAL ROUGH-IN REQUIREMENTS N.T.S

PANEL:	A (EXISTING)								MOUNTING:	RECESSED
208Y/120V	VOLTS,	3	PHASE,	4	WIRE				PANEL LOCATION:	TRASH ROOM
MAIN CB:	N/A	MLO:	225A	BUS:	225A	MIN,			FED FROM:	800A SERVICE SWITCH

NOTE: L-LIGHTING, R-RECEPTACLE, H-HVAC, M- MOTOR, E- KITCHEN/EQUIPMENTS, O- OTHER/MISCILLANEOUS

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	BUILDING SINAGE	L	0.50	2#12, #12G, 3/4"C	1.90			2#12, #12G, 3/4"C	1.40	E	BANK FRYER #31.04	20	2
3	20	BUILDING SINAGE	L	0.50	2#12, #12G, 3/4"C		1.77		2#12, #12G, 3/4"C	1.27	E	BROILER #24.44	20	4
5	2P-20	ICE MACHINE #16.18	E	1.19	2#12, #12G, 3/4"C			1.72	2#12, #12G, 3/4"C	0.53	E	50" MEAT WELL FREEZER #25.12	20	6
7			E	1.19		2.09			2#12, #12G, 3/4"C	0.90	R	DIGITAL MENU BOARD	20	8
9	2P-15	AC-1 (N)	M	0.19	2#12, #12G, 3/4"C		0.49		2#12, #12G, 3/4"C	0.30	R	SAFE	20	10
11			M	0.19				0.39	2#12, #12G, 3/4"C	0.20	L	MASTER CONTACTOR PANEL	20	12
13	2P-15	AC-2 (N)	M	0.19	2#12, #12G, 3/4"C	0.81			3#12, #12G, 3/4"C	0.62	M	WALK IN COOLER	3P-20	14
15			M	0.19			0.81			0.62	M			16
17	20	REACH-IN U.C. REFRIGERATOR #53.55	E	0.25	2#12, #12G, 3/4"C			0.87		0.62	M			18
19	20	REACH-IN U.C. REFRIGERATOR #53.56	E	0.25	2#12, #12G, 3/4"C	0.48			2#12, #12G, 3/4"C	0.23	L	SALES & CUSTOMER AREA LIGHTS	20	20
21	2P-40	CU-1 (N)	M	3.00	2#8, #10G, 3/4"C		3.45		2#12, #12G, 3/4"C	0.45	L	PREPARATION AREA LIGHTS	20	22
23			M	3.00				3.32	2#12, #12G, 3/4"C	0.32	L	PREPRATION AREA,OFFICE	20	24
25	20	SPARE				0.65			3#10, #10G, 3/4"C	0.65	M	WALK IN FREEZER	3P-30	26
27	20	SPARE					0.65			0.65	M			28
29	20	POS/ORDER ENTRY	R	0.36	2#12, #12G, 3/4"C			1.01		0.65	M			30
31	20	POS/ORDER ENTRY	R	0.36	2#12, #12G, 3/4"C	1.08			2#12, #12G, 3/4"C	0.72	R	SALES & CUSTOMER AREA RECEPTACLES	20	32
33	20	PRODUCT HOLDING FREEZER #32.52	E	0.53	2#12, #12G, 3/4"C		0.63		EXISTING	0.10	M	EF-1 (E) / ROOM LIGHT	15	34
35	2P-20	MULTI-PRODUCT HOLDING UNIT #51.39	E	1.08	2#12, #12G, 3/4"C			1.18	EXISTING	0.10	M	BEF-1 (E) / ROOM LIGHT & RECEPTACLE	15	36
37			E	1.08		12.75			3#3, #8G, 1"C	11.67	M	EDH-1 (N)	3P-100	38
39	20	SPARE					11.67			11.67	M			40
41	20	PREPARATION AREA RCEPTACLES	R	0.90	2#12, #12G, 3/4"C			12.57		11.67	M			42
TOTAL LOAD(KVA)						19.75	19.45	21.04						

PANEL:	B (NEW)								MOUNTING:	SURFACE
208Y/120V	VOLTS,	3	PHASE,	4	WIRE				PANEL LOCATION:	BOH
MAIN CB:	NA	MLO:	400 A	BUS:	425 A	MIN,			FED FROM:	1200A SERVICE SWITCH #3

NOTE: L-LIGHTING, R-RECEPTACLE, H-HVAC, M- MOTOR, E- KITCHEN/EQUIPMENTS, O- OTHER/MISCILLANEOUS

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	3P-50	CONVECTION OVEN #36.05	E	4.52	3#8, #10G, 3/4"C	7.52			2#8, #10G, 3/4"C	3.00	M	CU-3 (N)	2P-40	2
3			E	4.52			7.52			3.00	M			4
5			E	4.52				7.52	2#8, #10G, 3/4"C	3.00	M	CU-4 (N)	2P-40	6
7	20	RESTROOM SENSORS	O	0.10	2#12, #12G, 3/4"C	3.10				3.00	M			8
9	20	COOLER/FREEZER LIGHT & HEAT TAPE	M	1.05	2#12, #12G, 3/4"C		1.51		2#12, #12G, 3/4"C	0.46	M	WALK-IN COOLER CONDENSING UNIT	2P-20	10
11	20	ICE/SODA DISPENSER #11.03	E	0.17	2#12, #12G, 3/4"C			0.63		0.46	M			12
13	20	MOTORIZED DAMPER	M	0.45	2#12, #12G, 3/4"C	3.47			3#10, #10G, 3/4"C	3.02	M	WALK-IN FREEZER CONDENSING UNIT	3P-30	14
15	3P-20	EXHAUST FAN #23.07	M	1.90	3#12, #12G, 3/4"C		4.92			3.02	M			16
17			M	1.90				4.92		3.02	M			18
19			M	1.90		1.90						SPARE	20	20
21	20	HWCP-1	M	0.08	2#12, #12G, 3/4"C		1.58		2#12, #12G, 3/4"C	1.50	R	SHOW WINDOW RECEPTACLE	20	22
23	3P-100	PANEL "D"	O	8.23	4#3, #8G, 1 1/4"C			9.67	2#12, #12G, 3/4"C	1.44	M	CARBONATOR #10.81	20	24
25			O	8.23		8.23						SPARE	20	26
27			O	8.23			8.95		2#12, #12G, 3/4"C	0.72	R	OFFICE RECEPTACLES	20	28
29	2P-20	INFUSION TEA COFFE BREWER #17.56	E	1.35	2#12, #12G, 3/4"C			1.53	2#12, #12G, 3/4"C	0.18	R	GENERAL RECEPTACLE	20	30
31			E	1.35		7.35			3#8, #10G, 3/4"C	6.00	M	WH-1	3P-50	32
33	2P-20	FROZEN BEVERAGE DISPENSER #15.64	E	2.08	2#12, #12G, 3/4"C		8.08			6.00	M			34
35			E	2.08				8.08		6.00	M			36
37	2P-15	AC-3 (N)	M	0.19	2#12, #12G, 3/4"C	0.65			3#12, #12G, 3/4"C	0.46	M	ICE MAKER CONDENSING UNIT	3P-20	38
39			M	0.19			0.65			0.46	M			40
41	2P-15	AC-4 (N)	M	0.19	2#12, #12G, 3/4"C			0.65		0.46	M			42
43			M	0.19		1.34			2#12, #12G, 3/4"C	1.15	M	OAF-1 (N)	20	44
45	20	SPARE					0.17		2#12, #12G, 3/4"C	0.17	M	OAF-2 (N)	20	46
47	3P-20	SOFT SERVE FREEZER #15.22	E	1.56	3#12, #12G, 3/4"C			4.56	2#8, #10G, 3/4"C	3.00	M	CU-2 (N)	2P-40	48
49			E	1.56		4.56				3.00	M			50
51			E	1.56			1.56					SPARE	20	52
53	20	EXPEDITOR FORCED AIR FRY STATION- ROC #30.23	E	1.84	2#12, #12G, 3/4"C			1.84				SPARE	20	54
TOTAL LOAD(KVA)						38.11	34.94	39.40						

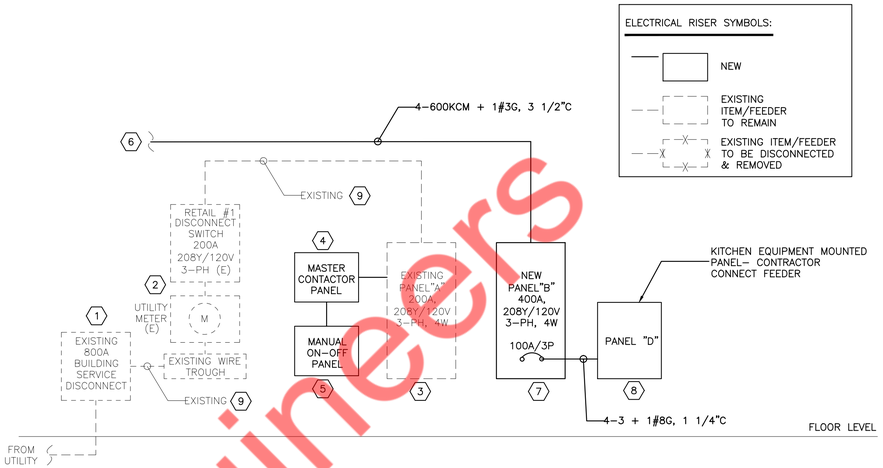
PANEL:	D (NEW)							MOUNTING:	FURNISHED BY EQUIPMENT SUPPLIER
208Y/120V	VOLTS,	3	PHASE,	4	WIRE			PANEL LOCATION:	KITCHEN AREA
MAIN CB:	NA	MLO:	100A	BUS:	100 A	MIN,		FED FROM:	PANEL A

NOTE: L-LIGHTING, R-RECEPTACLE, H-HVAC, M- MOTOR, E- KITCHEN/EQUIPMENTS, O- OTHER/MISCILLANEOUS

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	2P-20	MULTI-PRODUCT HOLDING UNIT #51.43	E	1.62	2#12, #12G, 3/4"C	3.24			2#12, #12G, 3/4"C	1.62	E	MULTI-PRODUCT HOLDING UNIT #51.43	2P-20	2
3			E	1.62			3.24			1.62	E			4
5	20	BEVERAGE REFRIGERATOR #40.55	E	0.72	2#12, #12G, 3/4"C			2.80	2#12, #12G, 3/4"C	2.08	E	MICROWAVE #50.12	2P-20	6
7	2P-20	MICROWAVE #50.12	E	2.08	2#12, #12G, 3/4"C	4.16				2.08	E			8
9			E	2.08			3.39		2#12, #12G, 3/4"C	1.31	E	EGG COOKER #59.51	2P-20	10
11	3P-30	DUAL CONTINUOUS FEED TOASTER #55.12	E	1.02	3#10, #10G, 3/4"C			2.33		1.31	E			12
13			E	1.02		2.04				1.02	E			14
15			E	1.02			2.04		3#10, #10G, 3/4"C	1.02	E	DUAL CONTINUOUS FEED TOASTER #55.12	3P-30	16
17	20	REACH-IN FREEZER #40.85	E	0.51	2#12, #12G, 3/4"C			1.53		1.02	E			18
19	20	SPARE				0.00						SPARE	20	20
21	20	SPARE					0.00					SPARE	20	22
23	20	SPARE						0.00				SPARE	20	24
TOTAL LOAD(KVA)						9.44	8.67	6.66						

1 ELECTRICAL PANEL SCHEDULES

N.T.S



RISER DIAGRAM KEYED WORK NOTES :

1. EXISTING 800A,208Y/120V, 3-PH ELECTRICAL SERVICE DISCONNECT SHALL REMAIN FOR THE SPACE. E.C. SHALL VERIFY THE RATING, LOCATION AND OPERABLE CONDITION OF EXISTING SERVICE DISCONNECT SWITCH IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
2. EXISTING 200A, 208Y/120V, 3-PH ELECTRICAL METER AND DISCONNECT SWITCH FOR THE PROJECT SPACE (RETAIL#1) SHALL REMAIN. E.C. SHALL COORDINATE WITH LANDLORD/OWNER TO VERIFY THE EXACT RATING, LOCATION AND OPERABLE CONDITION OF EXISTING METER AND DISCONNECT SWITCH IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
3. EXISTING 200A, 208Y/120V, 3PH, 4W ELECTRICAL PANEL "A" FOR THE PROJECT SPACE SHALL REMAIN. E.C. SHALL VERIFY THE EXACT RATING, LOCATION AND OPERABLE CONDITION OF EXISTING ELECTRICAL PANE "A" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
4. MASTER CONTACTOR PANEL. REFER TO WIRING DIAGRAM AND MORE DETAILS ON SHEET E-601.00.
5. MANUAL ON-OFF PANEL LOCATED IN MANAGER'S OFFICE. REFER TO SHEET E-201.00 FOR EXACT LOCATION.
6. E.C. SHALL COORDINATE WITH LANDLORD/OWNER AND PULL 400A, 208Y/120V, 3-PH ELECTRICAL SERVICE FOR THE PROJECT SPACE FROM 1200AMP SERVICE SWITCH #3 OF THE MAIN BUILDING ELECTRICAL SERVICE. E.C. SHALL COORDINATE WITH LANDLORD/OWNER FOR EXACT LOCATION, RATING AND OPERABLE CONDITION OF EXISTING 1200AMP SERVICE SWITCH#3 AND REQUIRED ELECTRICAL METER AND DISCONNECT SWITCH FOR THE PROJECT SPACE. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
7. NEW 400A, 208Y/120V, 3-PH, 4W ELECTRICAL PANEL "B" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH OWNER/ARCHITECT FOR EXACT LOCATION IN FIELD.
8. NEW 100A,208Y/120V,3-PH,4W ELECTRICAL PANEL "D" FOR THE KITCHEN EQUIPMENTS. PANEL SHALL BE SUPPLIED B THE KITCHEN EQUIPMENT SUPPLIER. E.C SHALL PROVIDE THE CONNECTION/FEEDER TO PANEL "D" IN COORDINATION WITH KITCHEN EQUIPMENT SUPPLIER.
9. EXISTING FEEDER SHALL REMAIN. E.C. SHALL VERIFY THE EXACT RATING, SIZE AND OPERABLE CONDITION OF EXISTING FEEDER IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

RISER DIAGRAM GENERAL NOTES:

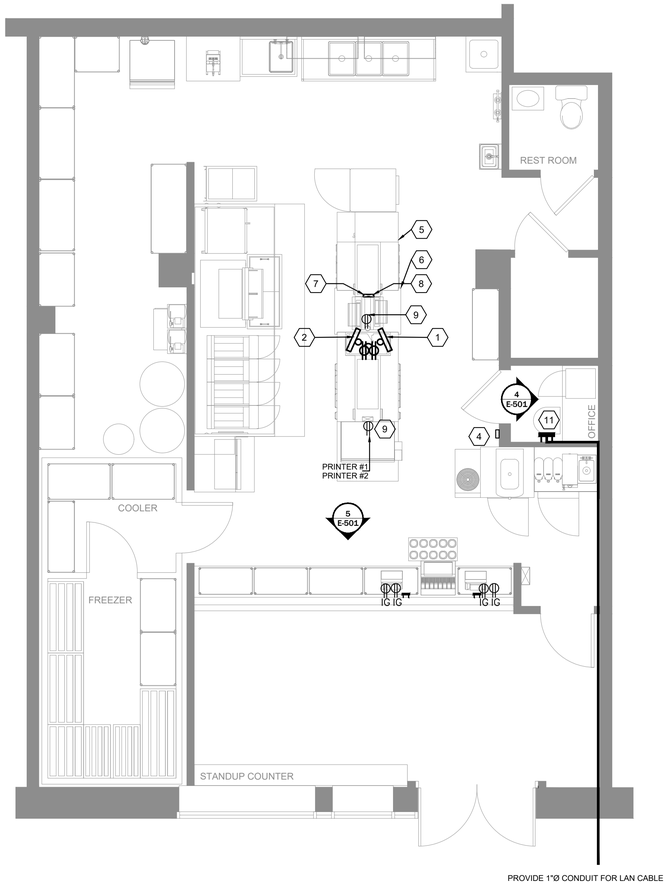
1. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSE ONLY. E.C TO VERIFY EXACT POWER DISTRIBUTION & OPERABLE CONDITION OF EXISTING DEVICES IN FIELD AND INFORM, ENGINEER FOR ANY DISCREPANCY.
2. E.C. SHALL VERIFY THE RATING, SIZE, LOCATION AND OPERABLE CONDITION OF ALL THE EXISTING PANELS AND ELECTRICAL CONNECTION IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
3. E.C. SHALL VERIFY THE INCOMING SERVICE AMPERAGE, VOLTAGE, NUMBER OF PHASES, WIRE SIZE AND DISTRIBUTION IN FIELD.
4. E.C. TO COORDINATE FAULT CURRENT (ISC) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
5. E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION & INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.

2 ELECTRICAL RISER DIAGRAM

N.T.S.

PANEL SCHEDULE GENERAL NOTES:

1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD AND INFORM ENGINEER FOR ANY DISCREPANCIES.
2. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
3. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBER & BREAKER SIZE OF EXISTING DEVICES IN FIELD.
4. E.C. SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE. BASE BID ACCORDINGLY.
5. E.C. SHALL VERIFY THE EXISTING EQUIPMENT LOAD & RATINGS IN FIELD AND ACCORDINGLY CONSIDER THE ELECTRICAL LOAD IN PANEL BOARD SCHEDULE.
6. E.C. TO UPDATE THE PANEL BOARD SCHEDULE AS PER EXISTING SITE CONDITION & NEW EQUIPMENT REQUIREMENTS.
7. EXISTING EQUIPMENTS AND ITS EXISTING ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY THE CIRCUIT NUMBER, BREAKER SIZE AND OPERABLE CONDITION OF EXISTING ELECTRICAL CONNECTION IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
8. EXISTING HVAC EQUIPMENTS AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY THE CIRCUIT NUMBER & OPERABLE CONDITION OF EXISTING ELECTRICAL CONNECTION IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.



1 TECHNOLOGY PLAN - FIRST FLOOR
1/4"=1'-0"

SYMBOL LEGEND

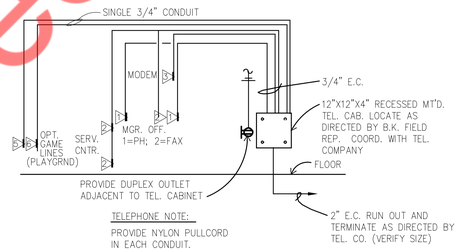
DETAIL	DESCRIPTION
1	DRYWALL P-RING
B.B	BUMP-BAR
	TELEPHONE OUTLET FOR P.O.S. MODEM (ALL OUTLETS HOMERUN IN 3/4" CONDUIT TO TELEPHONE BACKBOARD) MOUNT 96" A.F.F.
	P.O.S. PRINTER DEVICE
	P.O.S. REGISTER DEVICE
D	VIDEO DISPLAY DEVICE (CEILING MTD.)

TECHNOLOGY PLAN GENERAL NOTES:

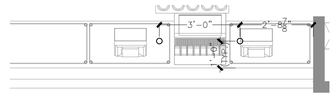
1. E.C. TO VERIFY WHICH SYSTEM IS TO BE INSTALLED. REQUIREMENTS CAN VARY DEPENDING ON MANUFACTURER.
2. E.C. TO PROVIDE ALL RECEPTACLES OUTLETS. CONDUITS AN J-BOXES AS INDICATED ON PLAN.
3. E.C. TO VERIFY AND COORDINATE LOCATION OF VIDEO DISPLAY DEVICES W/ BURGER KING REPRESENTATIVE.
4. MAINTAIN P.O.S. CABLES A MIN OF 12" AWAY FROM ANY LED LIGHT SOURCE ABOVE CEILING.
5. E.C. TO IDENTIFY P.O.S. JUNCTION BOXES ABOVE CEILING "GROUND P.O.S. ONLY".

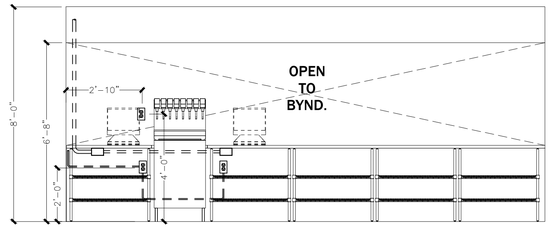
POWER PLAN KEYED WORK NOTES:

1. DISPLAY #1 AND BUMB BAR. PROVIDE 4"ø CONDUIT FOR VIDEO, BUMP BAR AND PRINTERS. PROVIDE CEILING MOUNTED RECEPTACLES. (TYPICAL FOR DISPLAY #1, #2 AND #3)
2. DISPLAY #2 AND BUMP BAR.
3. DISPLAY #3 AND BUMP BAR.
4. STOCK LEVEL LIGHT CONTROLLER @ 60" A.F.F.
5. TOTAL SERVICE TIME DISPLAY.
6. GRADE DISPLAY.
7. CLOCK-RECEPTACLE IN CHASE.
8. STOCK LEVEL DISPLAY RECEPTACLE IN CHASE.
9. EQUIPMENT MOUNTED RECEPTACLES BY K.E.S. CIRCUITING RUNS BY E.C.
10. J-BOX W/ 3/4" CONDUIT @ 84" A.F.F.
11. P-RING @ 24" A.F.F. W/ 1" CONDUIT TO ABOVE CLG.

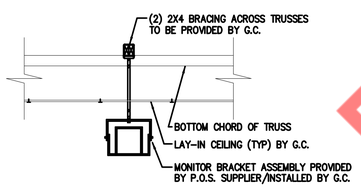


6 TELEPHONE RISER DIAGRAM
NTS



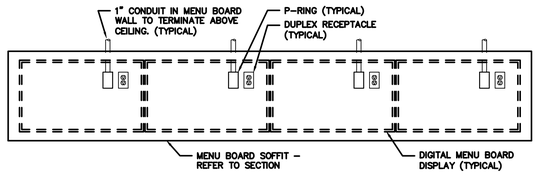


5 INTERIOR ELEVATION
3/8"=1'-0"

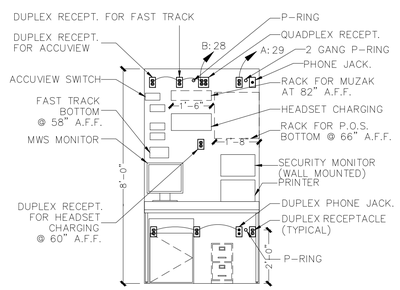


2 VIDEO HANGING BRACKET
NTS

NOTES:
1. (1) DUPLEX RECEPTACLE PER SCREEN
2. (1) P-RING PER SCREEN WITH 1" CONDUIT TO ABOVE CEILING. DATA CABLE TO RUN TO MEDIA PLAYER(S) IN OFFICE
3. VERIFY NUMBER OF SCREENS USED (3 OR 4) PRIOR TO INSTALLATION OF RECEPTACLES AND P-RINGS.
4. DETERMINE SCREEN AND MOUNTING BRACKET MODELS PRIOR TO INSTALLATION OF RECEPTACLES AND P-RINGS.
5. REFER TO SHEET E-201.00, POWER PLAN FOR CIRCUITING REQUIREMENTS.



3 DIGITAL MENU BOARD INSTALLATION
1/2"=1'-0"



4 INTERIOR ELEVATION
3/8"=1'-0"

"MORNING ARRIVAL"

STEP 1

TURN THE KITCHEN UNOCCUPIED–OCCUPIED SWITCH TO THE THE OCCUPIED POSITION. THE KITCHENS AIR CONDITIONING SYSTEM WILL GO FROM NIGHT SETBACK MODE TO THE THERMOSTAT SET POINT.

NOTE: THE AIR CONDITIONING FAN WILL START AND RUN CONTINUOUSLY. EXHAUST FAN WILL NOT RUN UNTIL THIS SWITCH IS IN THE OCCUPIED POSITION.

STEP 2

TURN ON THE EXHAUST FAN SWITCH TO THE ON POSITION THIS WILL ALLOW YOU TO TURN ON THE FRYERS AND BROILER.

"RESTAURANT OPEN FOR BUSINESS"

STEP 1

TURN THE DINING UNOCCUPIED–OCCUPIED SWITCH TO THE THE OCCUPIED POSITION. THE DINING AIR CONDITIONING SYSTEM WILL GO FROM NIGHT SETBACK MODE TO THE THERMOSTAT SET POINT.

STEP 2

TURN THE SIGN AND PARKING LOT LIGHTING SWITCHES TO THE AUTO POSITION, THIS WILL ENGAGE THE LIGHTING PHOTOCELLS SO THAT THE LIGHTS WILL AUTOMATICALLY COME ON AFTER DARK. TURN THE SWITCH TO THE ON POSITION TO OVER RIDE THE PHOTOCELLS AT ANY TIME THE LIGHTING MUST REMAIN ON.

"RESTAURANT CLOSE FOR BUSINESS"

STEP 1

TURN THE DINING UNOCCUPIED–OCCUPIED SWITCH TO THE UNOCCUPIED POSITION. THE DINING AIR CONDITIONING SYSTEM WILL GO FROM THE THERMOSTAT SET POINT TO THE NIGHT SET BACK MODE.

STEP 2

TURN THE SIGN AND PARKING LOT LIGHTING SWITCHES TO THE OFF POSITION, THIS WILL DISENGAGE THE LIGHTING PHOTOCELLS.

STEP 3

TURN THE EXHAUST FAN SWITCH TO THE OFF POSITION THE BROILERS EXHAUST FAN WILL CONTINUE TO RUN FOR 15 MINUTES FOR A COOL DOWN CYCLE, AND THEN SHUT OFF AUTOMATICALLY.

NOTE: THE FRYERS AND BROILER SHOULD BE TURNED OFF AND ALLOWED TO COOL DOWN BEFORE TURNING THE HOOD OFF. TO PREVENT ACCIDENTAL ANSUL DISCHARGE, THE BROILERS HOOD WILL ALWAYS RUN 15 MINUTES AFTER THE EXHAUST FAN SWITCH IS TURNED TO THE OFF POSITION.

"EMPLOYEES LEAVING THE BUILDING"

STEP 1

WHEN READY TO EXIT THE BUILDING PUSH THE SECURITY DEPARTURES SWITCH. THE PARKING LOT LIGHTS WILL COME BACK ON FOR 15 MINUTES THEN SHUT OFF AUTOMATICALLY.

"MANAGER/LAST PERSON LEAVING THE BUILDING"

STEP 1

TURN THE KITCHEN UNOCCUPIED–OCCUPIED SWITCH TO THE UNOCCUPIED POSITION. THE KITCHENS AIR CONDITIONING SYSTEM WILL GO FROM THE THERMOSTAT SET POINT TO THE NIGHT SET BACK MODE.

STEP 2

WHEN READY TO EXIT THE BUILDING PUSH THE SECURITY DEPARTURE SWITCH. THE PARKING LOT LIGHTS WILL COME BACK ON FOR 15 MINUTES THEN SHUT OFF AUTOMATICALLY.

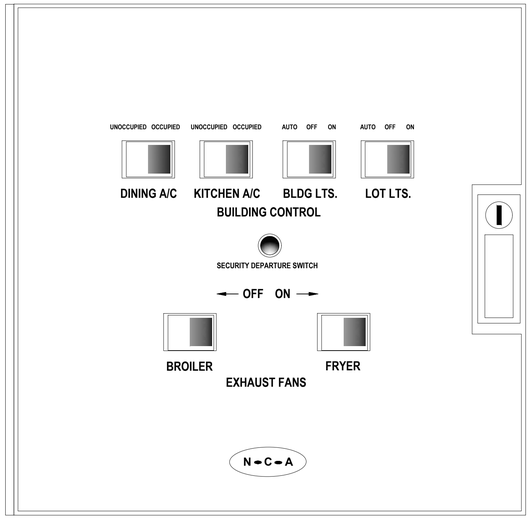
"HOOD VENTILATION SYSTEM NOTE"

WHEN THE HOOD EXHAUST FAN CURRENT SENSOR DETECTS A DROP IN AMPERAGE (SUCH AS A BELT BREAKING) IT WILL DISABLE THE LINE VOLTAGE TO THE EXHAUST FAN(S), FRYER AND BROILER APPLIANCES. THE EXHAUST FAN SWITCH SHOULD BE PLACED IN THE OFF POSITION AND THE FAN SHOULD BE CHECKED AND/OR REPAIRED BEFORE TURNING THE SWITCH TO THE ON POSITION.

"PARKING LOT LIGHTING NOTE"

WHEN THE PARKING LOT LIGHTS ARE TURNED OFF, THEY MUST COOL DOWN FOR ABOUT 10 MINUTES BEFORE THEY WILL COME BACK ON.

*NOTE: IF IT IS NECESSARY TO ADJUST THE AMPERAGE OF THE BROILER EXHAUST HOOD FAN MOTOR, THE FAN MOTOR CURRENT SENSOR MUST BE RESET AS FOLLOWS: ADJUST UNDERCURRENT POTENTIOMETER TO MAXIMUM (CLOCKWISE IS MAXIMUM.) APPLY CURRENT. ONCE CURRENT IS STABILIZED, DECREASE UNDERCURRENT POT UNTIL RED LIGHT TURNS OFF. WITHIN SEVEN SECONDS TURN UP UNTIL RED LIGHT TURNS ON. IF A LIGHT REMAINS OFF FOR MORE THEN TEN SECONDS, DISCONNECT SUPPLY VOLTAGE TO RESET. SEE INSTALLATION INSTRUCTIONS PN MRP COVER.



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SEQUENCE OF OPERATION

MANUAL CONTROL SYSTEM

THE A/C UNITS UNOCCUPIED-OCCUPIED SWITCH IS USED TO: TURN THE STORE ON IN THE MORNING AND OFF IN THE EVENING.

WHEN A/C UNIT UNOCCUPIED-OCCUPIED SWITCH IS TURNED TO THE ON POSITION:
THE AIR CONDITIONING SYSTEM WILL GO FROM NIGHT MODE TO SYSTEM ON.

THE AIR CONDITIONING FANS WILL START AND RUN CONTINUOUSLY.

THE OUTDOOR DAMPERS WILL OPEN TO A PRESET POSITION. (OPTIONAL)

DAMPERS WILL NOT OPEN DURING NIGHT SET BACK MODE. (OPTIONAL)

THE AIR CONDITIONERS WILL BEGIN TO COOL OR HEAT AT THE OCCUPIED TEMPERATURE SETPOINT.

THE COOKING EQUIPMENT AND EXHAUST FANS CAN NOW BE TURNED ON WHEN NEEDED.

WHEN A/C UNOCCUPIED-OCCUPIED SWITCH IS TURNED TO THE OFF POSITION:
EXHAUST FANS, SUPPLY FANS, AND EVAPORATOR BLOWERS WILL SHUT DOWN.

THE HEATING AND COOLING OPERATION SHALL REVERT TO SYSTEM NIGHT SET BACK MODE.

THE COOKING EQUIPMENT SHALL BE DISABLED.

THE SIGNAGE LIGHTING & LOT LIGHTING SHALL BE DISABLED IF SWITCHES ARE IN THE OFF POSITION.

THE PARKING LOT POLE LIGHTS & SECURITY LIGHTS SHALL REMAIN ON FOR 15 MIN AFTER THE SECURITY DEPARTURE SWITCH IS ACTIVATED.

WHEN THE HOOD EXHAUST FAN CURRENT SENSOR DETECTS A DROP IN AMPERAGE IT WILL DISABLE THE LINE VOLTAGE TO THE FRYER AND BROILER APPLIANCES.

HOOD VENTILATION SYSTEM

IF THE HOOD VENTILATION SWITCH IS IN THE OPEN POSITION, THE HOOD VENTILATION SYSTEM CAN BE STARTED.

THE BROILER SYSTEM AND THE FRYER SYSTEM SHALL BE STARTED BY MOVING THE ON/OFF SWITCH TO THE ON POSITION. IF EITHER THE BROILER OR FRYER SWITCH IS IN THE ON POSITION, THE MAKE-UP AIR UNIT (IF APPLICABLE) SHALL START AUTOMATICALLY.

ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM SHALL DE-ENERGIZE THE MAKE UP AIR UNIT, ALL A/C UNITS, AND THE CONTROLLED COOKING EQUIPMENT. THE BROILER AND THE FRYER EXHAUST SYSTEM SHALL CONTINUE TO OPERATE. THE FIRE SUPPRESSION SYSTEM SHALL BE MANUALLY RESET.

EXTERIOR LIGHTING CONTROL

ALL OF THE EXTERIOR LIGHTING SHALL BE CONTROLLED, WITH THE EXCEPTION OF THE SECURITY LIGHTS WHICH SHALL BE OPERATED BY ITS OWN PHOTOCELL. SECURITY LIGHTING IS OPTIONAL.

THE SIGNAGE SELECTOR SWITCH (3-POS.) CONTROLS THE PRIME SIGN, ALL MARQUEE SIGNS, AND BUILDING ACCENT LIGHTING.

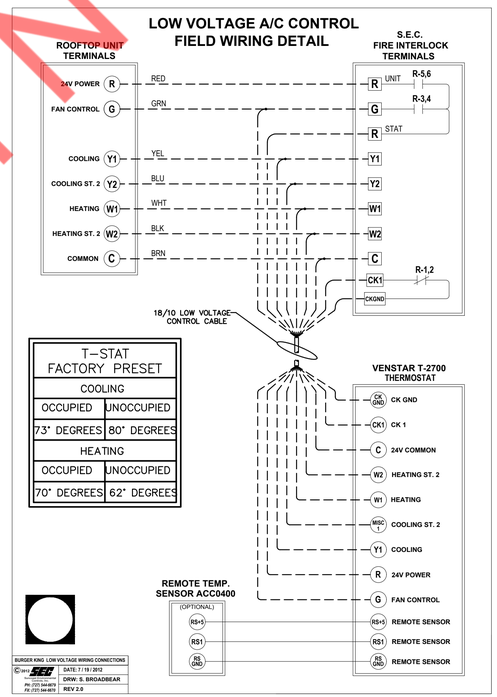
ON POSITION: LIGHTING SHALL BE ON PERMANENTLY.

OFF POSITION: LIGHTING SHALL BE OFF PERMANENTLY.

AUTO POSITION: LIGHTING SHALL BE CONTROLLED BY THE PHOTO CELL.

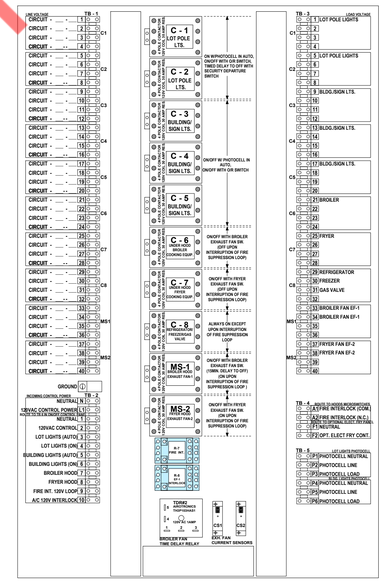
THE LOT LIGHTS THREE POSITION SWITCH WORKS THE SAME AS THE SIGNAGE SWITCH.

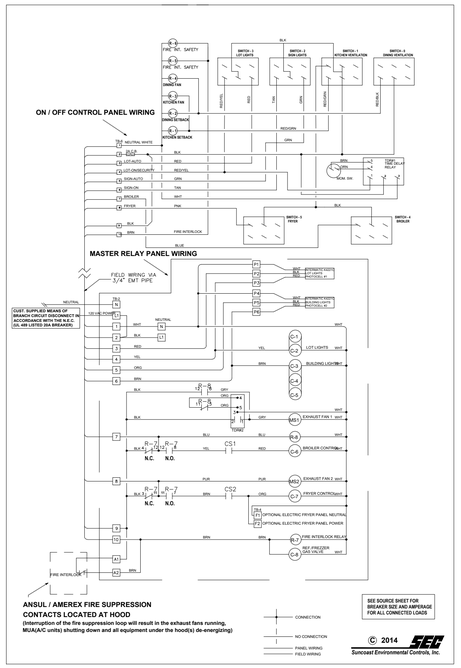
NOTE: UNOCCUPIED-OCCUPIED / MASTER RELAY PANEL SHALL BE COMPLETE WHEN SHIPPED TO THE JOB SITE. NO INTERNAL WIRING SHALL BE REQUIRED. MAKE ALL EXTERNAL WIRING CONNECTIONS AS REQUIRED.



ELECTRICAL CONTRACTOR NOTES:

1. RUN ONE (10) CONDUCTOR 18 GAUGE THERMOSTAT CABLE FROM THE ROOFTOP AIR CONDITIONING UNIT TO THE "UNOCCUPIED-OCCUPIED" PANEL.
2. RUN ONE (10) CONDUCTOR 18 GAUGE THERMOSTAT CABLE FROM THE "UNOCCUPIED-OCCUPIED" PANEL TO THE THERMOSTAT LOCATION.
3. RUN ONE (10) CONDUCTOR 18 GAUGE THERMOSTAT CABLE FROM THE ROOFTOP AIR CONDITIONING UNIT TO THE NIGHT SETBACK THERMOSTAT LOCATION, IF NOT CONTROLLED WITH P-374-2700 T-STAT. REFER TO SHEET MI-1
4. TERMINATION OF ALL 24 VOLT AIR CONDITIONING CONTROL WIRING SHALL BE DONE BY THE MECHANICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL RUN LINE VOLTAGE FROM THE CURRENT SENSOR LOCATED IN THE BROILER HOOD EXHAUST FAN TO THE CONTACTOR PANEL LOCATED BY THE SWITCHGEAR.





PANEL SCHEMATIC DIAGRAMS

PLUMBING LEGENDS

- DOMESTIC COLD WATER PIPING
- DOMESTIC HOT WATER PIPING
- HOT WATER RETURN
- VENT PIPING
- FILTERED WATER PIPING
- SAN — UNDERGROUND WASTE (SANITARY SEWER)
- GSAN — UNDERGROUND GREASE WASTE
- GATE VALVE
- CHECK VALVE
- UNION
- BACKFLOW PREVENTER
- PIPE UP
- PIPE DOWN
- FLOOR DRAIN
- HUB DRAIN
- FLOOR SINK
- FLOOR CLEAN OUT
- TIE INTO EXISTING
- BALANCING VALVE
- ISOLATION VALVE

PLUMBING ABBREVIATIONS

CO	CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
FW	FILTERED WATER
SAN	SANITARY
GSAN	GREASE SANITARY
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST.	EXISTING
FD	FLOOR DRAIN
BFP	BACK FLOW PREVENTER
HWCP	HOT WATER CIRCULATION PUMP
ET	EXPANSION TANK
WH	WATER HEATER

PLUMBING DRAWING LIST

APPLICABLE CODES

a. 2022 NYC BUILDING CODE.

b. 2022 NYC MECHANICAL CODE.

c. 2022 NYC PLUMBING CODE.

d. 2011 NYC ELECTRICAL CODE. (NEC).

e. 2022 NYC FUEL GAS CODE.

f. 2020 NYC ENERGY CONSERVATION CODE

g. 2016 NFPA 13.

SPECIAL INSPECTION PLUMBING NOTE

1. FIRE RESISTANT PENETRATION & JOINTS IN ACCORDANCE WITH NY CITY BUILDING CODE BC-1704.27
2. FINAL INSPECTION IN ACCORDANCE WITH NY CITY BUILDING CODE BC 110.5 DIRECTIVE FROM 14 OF 1975, AND 1 RCNY § 101-10
3. POST INSTALLATION ANCHOR INSPECTION TO BE DONE IN ACCORDANCE WITH NY CITY BUILDING COD BC-1704.32

BUILDING DEPARTMENT PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 THE NEW YORK CITY PLUMBING CODE (NYCPC).
2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 702.2
3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION PC 305.
4. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC 306.
5. RODENT PROOFING AS PER PC 304
6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303, PC 605, PC 702, PC 902,PC 1102.
7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER PC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708
9. BUILDING HOUSE TRAPS SHALL BE PROVIDED AS PER SECTION PC 1002.
10. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308
11. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION PC 601-603, 604, 606, 607, 608, 610
12. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708, 711.
13. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH PC 917
14. INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION PC 108, 312.
15. ALL WORK SHALL COMPLY WITH THE 2020 NYC ENERGY CONSERVATION CODE (NYCECC). EXCEPT WHERE EXPLICITLY STATED IN THE CODE, IT IS NOT RETROACTIVE IN EXISTING BUILDINGS. ADDITIONS TO EXISTING BUILDING MUST COMPLY WITH THE NYCECC.
16. GAS PIPING INSTALLATION SHALL IN ACCORDANCE WITH 2022 NYC FUEL GAS CODE CHAPTER 4.

ENERGY CONSERVATION CODE OF NEW YORK CITY COMPLIANCE

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CODE OF NEW YORK CITY 2020

PLUMBING SPECIFICATIONS

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

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

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

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

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

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

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

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

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

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

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

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

1.02 SUBMITTALS

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

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

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

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

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

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

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

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

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

1.03 SUBSTITUTIONS

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

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

1.04 DEFINITIONS

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

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

C. PROVIDE: TO FURNISH AND INSTALL.

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

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

1.05 DRAWINGS

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

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

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

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

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

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

1.06 PRODUCTS

A. SANITARY AND VENT PIPING:

1. ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM NO. OF BANDS PER COUPLING AS PER CISPI 310-12.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
3. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY SECTION C404.4 REFER WITH NYC ENERGY CONSERVATION CODE 2020 BELOW TABLE C403.11.3

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
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

7. HEATED WATER SUPPLY PIPING SHALL BE IN ACCORDANCE WITH NYC ENERGY CONSERVATION CODE 2020 SECTION C404.5.1 OR C404.5.2. THE FLOW RATE THROUGH 1/4-INCH PIPING SHALL BE NOT GREATER THAN 0.5 GPM. THE FLOW RATE THROUGH 5/16-INCH PIPING SHALL BE NOT GREATER THAN 1 GPM. THE FLOW RATE THROUGH 3/8-INCH PIPING SHALL BE NOT GREATER THAN 1.5 GPM. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER NYC ECC 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.

NOMINAL PIPE SIZE (INCHES)	MIXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
⅜"	3'	50'
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'

8. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.
9. PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.
10. AS PER NYCECC 2020 C404.3 STORAGE TANK TYPE WATER HEATERS AND HOT WATER STORAGE TANKS THAT HAVE VERTICAL WATER PIPES CONNECTING TO THE INLET AND OUTLET OF THE TANK SHALL BE PROVIDED WITH INTEGRAL HEAT TRAPS AT THOSE INLETS AND OUTLETS OR SHALL HAVE PIPE CONFIGURED HEAT TRAPS IN THE PIPING CONNECTED TO THOSE INLETS AND OUTLETS.
11. AS PER NYC ENERGY CONSERVATION CODE 2020 C404.6.1 HEATED-WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.
12. WATER DISTRIBUTION SYSTEM AS PER NYC ENERGY CONSERVATION CODE 2020 C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
    a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
    b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).

C. PRESS JOINERY SYSTEM:

a. FITTINGS ½" – 4":

1. WHERE APPROVED BY THE LOCAL JURISDICTION, THE NIBCO PRESS SYSTEM MAY BE USED AT THE CONTRACTOR'S OPTION FOR THE FOLLOWING BUILDING SERVICES PIPING –20°F TO +250°F UP TO 200 PSI:
   - HOT AND COLD DOMESTIC WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED.
   - POTABLE WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED.
   - HOT WATER HEATING SERVICE

ALL LEAD FREE WROT COPPER PRESS FITTINGS SHALL BE MADE FROM COMMERCIALLY PURE COPPER MILL PRODUCTS PER ASTM B 75 ALLOY C12200. THESE FITTINGS SHALL BE THIRD-PARTY CERTIFIED TO NSF/ANSI 61 ANNEX G AND COMPLY WITH NEW YORK CITY HEALTH AND SAFETY CODE,NYC PC 2022 AND VERMONT ACT 193. NIBCO LEAD FREE CAST DEZINCIFICATION-RESISTANT (DZR) FITTINGS SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. THE PRESS FITTINGS CONNECTIONS SHALL BE COMPATIBLE WITH SEAMLESS K, L OR M COPPER TUBE MADE TO ASTM B 88. FITTINGS SHALL HAVE A MAXIMUM NON-SHOCK WORKING PRESSURE OF 200 PSI BETWEEN THE TEMPERATURES OF –20°F AND +250°F. ELASTOMERIC SEALS WITH LEAK DETECTION DESIGN SHALL BE MADE OF EPDM MATERIAL, AND THE FITTINGS SHALL BE MANUFACTURED WITH AN INBOARD BEAD DESIGN. NIBCO PRESS FITTINGS MEET ALL PERFORMANCE REQUIREMENTS OF ASME B16.22 AND B16.18ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ACCORDING TO LOCAL PLUMBING AND MECHANICAL CODES. THE PRESS-TO-CONNECT JOINT SHALL BE MADE WITH PRESSING TOOLS AND JAW SETS RECOMMENDED AND AUTHORIZED BY NIBCO. ALL FITTINGS, VALVES AND TOOLS SHALL BE PROVIDED BY SAME MANUFACTURER; NIBCO.

b. VALVES 2" AND SMALLER: BALL VALVES: (ON/OFF, ISOLATION OR THROTTLING)

1. BALL VALVES (STAINLESS STEEL BALL AND STEM) WITH MALE OR FEMALE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI CWP TO +250°F MAXIMUM. NIBCO LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-110 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODIES AND END PIECES AND SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. NO BRASS CONTAINING MORE THAN 15% ZINC SHALL BE APPROVED. VALVE SHALL HAVE REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, SOLID STAINLESS STEEL BALL AND STEM. NO HOLLOW CHROME PLATED BALLS ACCEPTED. ALL VALVES SHALL BE FULL PORT. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
   - WHERE PIPING IS TO BE INSULATED, BALL VALVES SHALL BE EQUIPPED WITH 2" EXTENDED HANDLES OF NON-THERMAL CONDUCTIVE MATERIAL HANDLE TO HAVE EXTENDED SLEEVE INCORPORATING AN INSULATION PLUG TO PROVIDE A VAPOR BARRIER AND ALLOW VALVE OPERATION WITHOUT DISTURBING THE INSULATION, AND A MEMORY STOP, WHICH CAN BE SET AFTER INSTALLATION.
   - ACCEPTABLE VALVES: (NSF-61, NON-INSULATED LINES): NIBCO PC585-66-LF, -HC, -LL
   - ACCEPTABLE VALVES: (NSF-61, INSULATED LINES): NIBCO PC585-66-LF-NS, -HC, -LL

c. CHECK VALVES: (BACKFLOW PREVENTION)

1. VALVES WITH PRESS-TO-CONNECT ENDS SHALL BE RATED TO 200 PSI CWP AT +250°F MAXIMUM. NIBCO LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-80 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODY & CAP SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. DISC SHALL BE TFE TEFLON. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
   - ACCEPTABLE CHECK VALVES: NIBCO PS413-Y-LF: Y PATTERN, SWING TYPE CHECK VALVE; NIBCO PS480-Y-LF : IN-LINE SPRING LOADED SILENT CHECK VALVE

d. BUTTERFLY VALVES 2-1/2" – 4", (ON/OFF, ISOLATION OR THROTTLING)

1. BUTTERFLY VALVES WITH FEMALE LEAD FREE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI. CWP TO +250°F MAXIMUM. VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-67 AND CONSTRUCTED OF A DUCTILE-IRON BODY, FOR BUBBLE-TIGHT SHUTOFF, EXTENDED-NECK FOR INSULATION, DISC AND LINING SUITABLE FOR POTABLE WATER, VALVES SHALL BE SUITABLE FOR BI-DIRECTIONAL DEAD END SERVICE AT FULL RATED PRESSURE, ONE-PIECE TYPE 416 STAINLESS-STEEL STEM, COPPER BUSHING, FASTENERS AND PINS SHALL NOT BE USED TO ATTACH STEM TO DISC, NO PINS OR FASTENERS IN WATERWAY, ALUMINUM-BRONZE DISC, AND MOLDED-IN EPDM SEAT (LINER). ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
   - ACCEPTABLE VALVES: NIBCO PFD2000 SERIES (NSF-61)
   - GD4765N-LF (NSF-61)

D. MIXING VALVES

1. VALVE BODY SHALL BE MADE OF CAST BRASS. THE INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.
2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM, AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 105°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 5GPM @ 45 PSIG DIFFERENTIAL.

3. TYPES OF VALVES: TYPE A– THERMOSTATICALLY OPERATED BY MEANS OF BI–METALLIC STRIP, OR EXPANSION BELLOWS; TYPE B– SINGLE HANDLE MECHANICAL MIXER, OR INDIVIDUAL HOT AND COLD CONTROL VALVES; TYPE C– PRESSURE BALANCING SHOWER VALVE/PISTON OPERATED MIXING VALVE; TYPE D– BALANCED PRESSURE OPERATION, WITH INTEGRAL DIAL THERMOMETER INDICATING DELIVERED WATER TEMPERATURE.

4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT–OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

E. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.

2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.

3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.

4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION, THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2–1/2" AND LARGER (1–1/4" AND LARGER INBOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.

6. SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

F. HOT WATER RE–CIRCULATING PUMP

1. IN–LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD–FREE BRONZE IMPELLER.

2. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON–OVERLOADING AT ANY POINT ON PUMP CURVE.

3. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP–PROOF, SLEEVE– BEARING, QUIET OPERATING, RUBBER–MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT–IN THERMAL OVERLOAD PROTECTION.

4. INSTALL IN–LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS, BOTH SIDES OF IN–LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.

G. ELECTRIC WATER HEATER

1. TANKS SHALL 80 GALLONS CAPACITY AND SHALL HAVE 150 PSI WORKING PRESSURE AND BE EQUIPPED WITH EXTRUDED HIGH DENSITY ANODE.

2. ALL INTERNAL SURFACES OF THE HEATER(S) EXPOSED TO WATER SHALL BE GLASS–LINED WITH AN ALKALINE BORO SILICATE COMPOSITION THAT HAS BEEN FUSED–TO–STEEL BY FIRING AT A TEMPERATURE RANGE OF 1400°F TO 1600°F.

3. ELECTRIC HEATING ELEMENTS SHALL BE LOW WATT DENSITY GOLDENROD 1" SCREW–IN TYPE.

4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT–OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

H. VALVES:

1. PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT–OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT–OFF DUTY.

2. ALL FIXTURES WITH THE EXCEPTION O FLUSHOMETER–EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME–PLATED STOPS WITH CHROME–PLATED ESCUTCHEONS ON PIPING PENETRATIONS.

3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT–OFF VALVES ON SUPPLY LINES.

4. ALL BRANCH LINES TO HAVE SHUT–OFF VALVES.

5. ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.

6. PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.

I. SLEEVES AND ESCUTCHEONS:

1. SLEEVES THROUGH STRUCTURAL CONCRETE MEMBERS AND SLEEVES FOR WALLS BELOW GRADE AND FLOORS ON GRADE SHALL BE STANDARD WEIGHT GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH OTHER THAN STRUCTURAL COMPONENTS OF THE BUILDING SHALL BE 20 GAGE GALVANIZED SHEET METAL WITH LOCK SEAM JOINTS. USG THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.

2. PIPE ESCUTCHEON PLATES SHALL BE INSTALLED WHERE EXPOSED PIPING PASSES THROUGH WALLS, CEILINGS, AND FLOORS AND SHALL BE MINIMUM 20 GAGE STEEL. PROVIDE CHROME PLATED ESCUTCHEON PLATES IN FINISHED AREAS.

J. DRAINAGE ACCESSORIES

1. GENERAL:
   a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.

   b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

K. DEVICES:

   a. CLEANOUT & CLEANOUT PLUG

- THREADED PIPE FITTING OR CAST IRON FERRULE WITH GAS TIGHT CLEANOUT PLUG
- PLUG SHOULD BE CAST BRASS OR BRONZE, WITH THREADED END, AND RAISED OR COUNTERSUNK HEAD.
- LUBRICATE THREADS OF CLEANOUT PLUG WITH ANTI–SEIZE LUBRICANT BEFORE FINAL INSTALLATION.

   b. CLEANOUT WALL PLATE

- IT SHOULD BE ROUND, STAINLESS STEEL OR POLISHED CHROME PLATED BRONZE COVER PLATE WITH STAINLESS STEEL VANDAL RESISTANT FASTENER TO SECURE TO CLEANOUT PLUG.

   c. CLEANOUT DECK PLATE

- IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORIATED TOP SECURED TO CLEANOUT PLUG WITH STAINLESS STEEL VANDAL RESISTANT FASTENER; THREADED HEIGHT ADJUSTMENT, CAST IRON HEAD, GAS TIGHT CLEANOUT PLUG, AND CONNECTION TO MATCH PIPING OPTION SELECTED.

- GRILLE FREE AREA SHOULD BE AT LEAST EQUAL TO CROSS–SECTION AREA OF PIPE TO WHICH CONNECTION MADE AND MADE OF POLISHED NICKEL BRONZE, WITH REMOVABLE GRATE, EITHER PERFORATED OR BAR TYPE. GRATE ATTACHED TO GRILLE BODY WITH VANDAL RESISTANT FASTENER.

L. INDIRECT WASTE FLOOR SINK

   a. IT SHOULD BE COMBINATION OF FUNNEL DRAIN AND P TRAP WITH POLISHED CHROME PLATED CAST BRASS CONSTRUCTION WITH 4" TOP DIA., 4" DEEP WITH THREADED OUTLET.

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

N. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'–0" IN LENGTH.

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

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

Q. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

S. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

V. FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.

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

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

Y. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE.

Z. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.

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

AB. UNLESS OTHERWISE INDICATED, TRAPS SEALS AT ALL FLOOR DRAINS SHALL BE MAINTAINED BY AN APPROVED TRAP PRIMING DEVICE.

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

AD. MAINTAIN MINIMUM 10'–0" CLEARANCE BETWEEN ALL PLUMBING V.T.R.S AND ALL OUTDOOR AIR INTAKES. OFFSET VENT STACKS AND STACK VENTS IF AND AS REQUIRED BELOW ROOF TO MAINTAIN SUCH CLEARANCE WHETHER OR NOT SUCH OFFSET IS INDICATED ON THE DRAWINGS. PROVIDE ALL REQUIRED SEISMIC SUPPORTS.

2. INSTALLATION

2.01 GENERAL

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

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

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

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

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

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

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

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

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

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

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

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

2.02 ABOVE GRADE

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

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

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

2.03 INSULATION (PIPE AND FITTINGS)

A.PIPING

COVER ALL HOT WATER PIPE WITH 1" THICK FOR PIPE SIZE UP TO 1¼" AND 1½" THICK FOR PIPE SIZE 1½" AND GREATER WITH MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH ½" THICK FOR PIPE SIZE UP TO 1¼" AND 1" THICK FOR PIPE SIZE 1½" AND GREATER WITH 1" MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE NEW YORK CITY BUILDING CODE REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2020 NYC ENERGY CONSERVATION CODE

3. TESTING

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

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

C. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.

D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.

E. ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.

F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT, CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.

G. ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN.

H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.

I. ALL EQUIPMENT WILL BE FACTORY TESTED.

J. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ANY LEAKS OR DAMAGE THAT OCCURS AS A RESULT OF SYSTEM TESTING. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LIMIT ANY POTENTIAL DAMAGE. CORRECTIVE ACTION REQUIRED AS A RESULT OF TESTING SHALL BE PERFORMED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.

K. REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.

L. TESTING REQUIREMENTS
   a. TEST ALL DOMESTIC WATER PIPING HYDROSTATICALLY TO 125 PSIG.
   b. HYDROSTATIC TEST PRESSURES SHALL REMAIN CONSTANT WITH NO VARIATION FOR 120 MINUTES.
   c. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
   d. THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

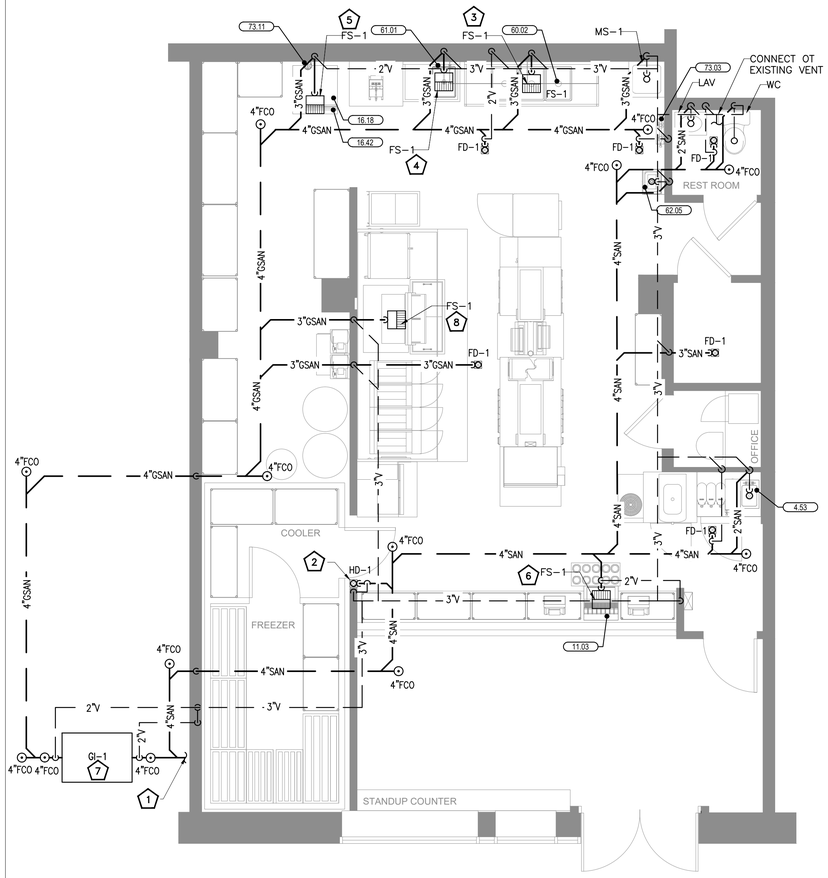
M. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

N. THOROUGHLY FLUSH PIPING SYSTEM WITH FRESH WATER IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

O. INSPECTION & TESTING SHALL BE AS PER 2022 THE NEW YORK CITY PLUMBING CODE (NYCPC) SECTION 108.

4. WARRANTY

A. EQUIPMENT, MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR SHALL KEEP THE WORK IN GOOD REPAIR FOR ONE YEAR AFTER THE DATE OF FINAL APPROVAL. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY CORRECT AND REPAIR ANY AND ALL BREAKS, FAILURES OR WEAR DUE TO FAULTY MATERIALS, WORKMANSHIP OR EQUIPMENT. ALL SETTLEMENTS OF SURFACES THAT MAY OCCUR WITHIN THAT PERIOD SHALL ALSO BE PROMPTLY REPAIRED.



1 SANITARY PLAN - FIRST FLOOR

1/4"=1'-0"

GREASE INTERCEPTOR CALCULATIONS PER DEP TITLE 15 RCNY 19-11 (GI-1)

TABLE 1

3 COMPARTMENT UTILITY SINK
DESCRIPTION: #3-COMP. SINK

SIZE PER COMP. = 16"L x 21"W x 14"H = 4704 CU.IN.
SIZE PER SINK = 4704 CU.IN. x 3 = 14112 CU.IN.

1-COMP SINK
DESCRIPTION: #1-COMP SINK
SIZE PER SINK = 21"L x 18"W x 8"H = 3024 CU.IN.
TOTAL VOLUME FOR #1 SINKS: = 3024 CU.IN.

MOP SINK
DESCRIPTION: #MS-1
SIZE PER SINK = 24"L x 24"W x 12"H = 6,912 CU.IN.
TOTAL VOLUME FOR #1 SINKS: = 6,912 CU.IN.
6,912 X 1 = 6,912 CU.IN.

FLOOR DRAIN
DESCRIPTION: #FLOOR DRAIN
TOTAL VOLUME FOR #1 FLOOR DRAIN = 1540 CU.IN.
1540 X 3 = 4620 CU.IN.

FLOOR SINK
DESCRIPTION: #FLOOR SINK
TOTAL VOLUME FOR #2 FLOOR SINK = 1540 CU.IN.
1540 X 2 = 3080 CU.IN.

TOTAL VOLUME = 31748 CU. IN
TOTAL FLOW = 75 GPM
TOTAL (LB) =150 LBS

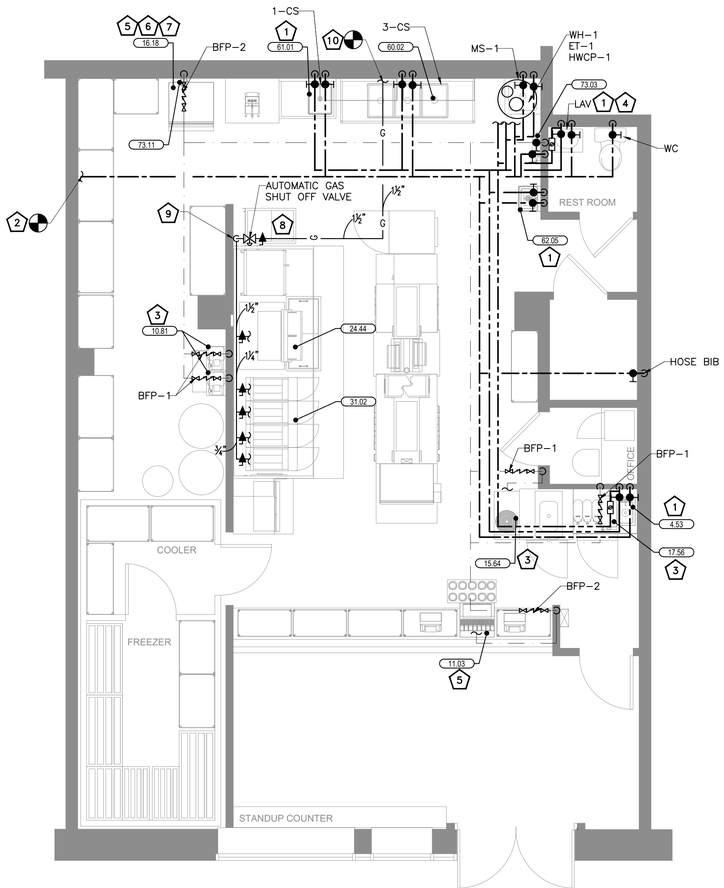
PROPOSED GREASE INTERCEPTOR: SCHIER GB-75

GENERAL NOTES:

1. CONTRACTOR SHALL INSULATE ALL INDIRECT DRAIN LINES (INCLUDING CONDENSATE FROM ALL MECHANICAL COOLING & REFRIGERATION EQUIPMENT, COLD WELLS, ICE TRAYS AND ANY FIXTURE/EQUIPMENT ITEM THAT MAY CONVEY WASTE UNDER 65°F AND/OR CAUSES CONDENSATION ON PIPING SURFACES. INSULATION SHALL BE 1/2" THICK CLOSED CELL ELASTOMERIC (RUBATEX OR EQUIV.).
2. VERIFY WITH GENERAL CONTRACTOR AND KITCHEN EQUIPMENT VENDOR FINAL LOCATION OF ALL FLOOR SINKS AND FLOOR DRAINS. LOCATE FLOOR SINKS AND FLOOR DRAINS TO AVOID LEGS OF KITCHEN EQUIPMENT.
3. REFER TO ARCHITECTURAL PLANS AND KITCHEN VENDOR DRAWINGS FOR DIMENSIONAL INFORMATION.
4. SAFETY ASPECTS OF THE WORK ARE EXCLUSIVELY THE RESPONSIBILITY OF THE CONTRACTOR.
5. UNLESS OTHERWISE NOTED, SLOPE OF DRAINAGE SYSTEM TO BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3"(2-1/2"); 1/4" PER FOOT FOR PIPE 3"(2-1/2") AND SMALLER.
6. BEFORE SUBMITTING BID, CONTRACTOR SHALL CONDUCT AN ON-SITE INSPECTION TO VERIFY CONDITIONS. ALL WORK SHOWN IS A SCHEMATIC REPRESENTATION OF DESIGN INTENT. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED AND SHALL BE PROVIDED AT NO ADDITIONAL COST. ANY MAJOR DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.
7. CONTRACTOR SHALL COORDINATE ALL WORK PROCEDURES WITH REQUIREMENTS OF ARCHITECT, ENGINEER, OWNER, CONSTRUCTION MANAGER, BUILDING MANAGEMENT, NEIGHBORHOOD ASSOCIATION, AND/OR LOCAL AUTHORITIES.
8. SAFETY ASPECTS OF THE WORK ARE EXCLUSIVELY THE RESPONSIBILITY OF THE CONTRACTOR.
9. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT
10. ALL MATERIAL INDICATED AND IMPLIED ON THESE DRAWINGS SHALL BE NEW UNLESS OTHERWISE NOTED.
11. ALL SHUT-OFF VALVES TO BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE NECESSARY.
12. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION, OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED IN THE WORK AS IF IT WERE SPECIFIED OR INDICATED ON THE DRAWINGS.

WASTE & VENT PLAN KEYED NOTES:

1. CONNECT NEW 4" SANITARY WASTE PIPING TO EXISTING 6" SANITARY PIPE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, INVERT AND LOCATION PRIOR TO INSTALLATION.
2. ROUTE CONDENSATE DRAIN FROM WALK-IN COOLER AND WALK-IN FREEZER TO HUB DRAIN WITH APPROVED AIR GAP.
3. ROUTE INDIRECT WASTE FROM 3-COMP SINK TO FLOOR SINK WITH APPROVED AIR GAP.
4. ROUTE INDIRECT WASTE FROM 1-COMP SINK TO FLOOR SINK WITH APPROVED AIR GAP.
5. ROUTE INDIRECT WASTE FROM ICE MACHINE AND ICE STORAGE BIN TO FLOOR SINK WITH APPROVED AIR GAP.
6. ROUTE INDIRECT WASTE FROM ICE/SODA DISPENSER TO FLOOR SINK WITH APPROVED AIR GAP.
7. SURFACE MOUNTED GREASE INTERCEPTOR SCHIER GB-75 OR EQUIVALENT. INSTALL GREASE INTERCEPTOR AS PER MANUFACTURER RECOMMENDATION.
8. ROUTE INDIRECT WASTE FROM BROILER AND FRYER TO FLOOR SINK WITH APPROVED AIR GAP.



1 WATER AND GAS PLAN - FIRST FLOOR

1/4"=1'-0"

DOMESTIC WATER PIPING PLAN NOTES:

1. COORDINATE ROOF PENETRATIONS WITH THE LANDLORD'S ROOFING CONTRACTOR (IF REQUIRED). PROVIDE AND PAY FOR ANY REQUIRED ROOFING BY LANDLORD'S ROOFING CONTRACTOR.
2. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE BUILDING STRUCTURE OR BUILDING UTILITIES CAUSED AS RESULT OF THE CONTRACTOR'S WORK UNDER THIS CONTRACT. IT IS RECOMMENDED THAT MASONRY/CONCRETE FLOORS/WALLS/ROOF BE X-RAYED PRIOR TO ANY PENETRATIONS.
3. REFER TO ARCHITECTURAL PLANS AND KITCHEN VENDOR DRAWINGS FOR DIMENSIONAL INFORMATION.

GAS PIPING INSTALLATION NOTES:

1. GAS SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH STATE AND LOCAL CODES. SUBMIT SHOP DRAWINGS TO ENGINEER SHOWING FINAL ROUTING, MATERIALS, SHUT-OFFS, DETAILS, LINE SIZES FOR A COMPLETE GAS SERVICE TO THIS PROJECT.
2. THE GAS SYSTEM HAS BEEN DESIGNED USING THE LONGEST LINE METHOD WITH THE FOLLOWING

   CRITERIA:

   1,000 BUT/HR = 1 MBH = 1 CFH

   SPECIFIC GRAVITY: 0.60

   INLET PRESSURE: LESS THAN 2 PSI

   PRESSURE DROP: 0.5 IN. W.C.

   PIPE SIZING PER TABLE 402.4(2) NYC FUEL GAS CODE 2022.

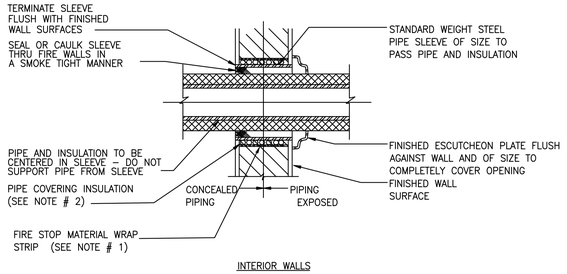
3. THIS PROJECT REQUIRES 416 MBH OF GAS CAPACITY AT 105 FT. T.D.L. CONTRACTOR SHALL VERIFY EXACT GAS REQUIREMENT WITH TENANT PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL PROVIDE AND PAY FOR ANY REQUIRED UPGRADE OF EXISTING GAS SERVICE AND METER.
5. CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THE BUILDING STRUCTURE OR BUILDING UTILITIES CAUSED AS RESULT OF THE CONTRACTOR'S WORK UNDER THIS CONTRACT. IT IS RECOMMENDED THAT MASONRY/CONCRETE FLOORS/WALLS/ROOF BE X-RAYED PRIOR TO ANY PENETRATIONS.
6. COORDINATE ROOF PENETRATIONS WITH THE LANDLORD'S ROOFING CONTRACTOR (IF REQUIRED). PROVIDE AND PAY FOR ANY REQUIRED ROOFING BY LANDLORD'S ROOFING CONTRACTOR.
7. VERIFY ALL GAS CONNECTIONS WITH MANUFACTURER'S INSTRUCTIONS PRIOR TO CONSTRUCTION. PROVIDE CABLE RESTRAINTS FOR ALL GAS FIRED EQUIPMENT ON MOVABLE EQUIPMENT

416 TOTAL MBH
105' TOTAL DISTANCE
SIZED ACCORDING TO TABLE 402.4(2)
NYC FUEL GAS CODE 2022

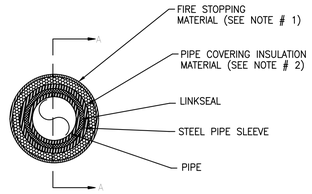
THIS CONTRACTOR IS RESPONSIBLE FOR VERIFYING ACTUAL DISTANCE FROM METER TO GAS APPLIANCES AND TO RESIZE GAS LINES AS REQUIRED.

DOMESTIC WATER & GAS PLAN KEY NOTES:

1. PROVIDE ASSE 1070 COMPLIANT TEMPERATURE MIXING VALVE, SET AT 110°, ON ALL HANDSINKS AND LAVATORIES.
2. CONNECT NEW 1-1/2" DOMESTIC WATER PIPE TO EXISTING 1-1/2" WATER LINE WITH EXISTING WATER SUB METER AND BACKFLOW PREVENTER. CONTRACTOR TO FIELD VERIFY LOCATION AND SIZE.
3. 1/2" WATTS SD-3 CHECK BACKFLOW PREVENTER IN SUPPLY LINE IN FILTERED WATER LINE AT THE BAG-IN-BOX,FROZEN BEVERAGE DISPENSER AND TEA BREWER PER PLAN. VENT SHALL DRAIN TO AN APPROVED WASTE RECEPTOR PER LOCAL CODE. LOCATE IN ACCESSIBLE LOCATION.
4. HOT WATER RECIRCULATION: EXTEND HOT WATER LOOP DOWN IN WALL TO WITHIN 2' OFF FAUCET CONNECTIONS.
5. 1/2" WATTS LF009 RPZ BACKFLOW PREVENTER IN SUPPLY LINE TO ICE MACHINE,ICE SODA DISPENSER AND ALL EQUIPMENT CONNECTING TO FILTERED WATER. LOCATE IN ACCESSIBLE LOCATION. THE VALVE SHALL DRAIN INDIRECTLY TO AN APPROVED WASTE RECEPTOR WITH AN AIR GAP OF TWICE THE DIAMETER OF THE PIPE DIAMETER OR PER LOCAL CODE.
6. ICE MACHINE: PROVIDE 1/2" FW LINE DOWN TO ICE MACHINE. PROVIDE #TO10S FILTER WITH SCALE CONTROL.
7. WATER HAMMER ARRESTOR: PROVIDE AND INSTALL WATER HAMMER ARRESTOR (WHA) IN THIS LOCATION AND AS REQUIRED PER LOCAL CODE.
8. PROVIDE GAS AUTOMATIC EMERGENCY SHUT-OFF VALVE CONTROLLED BY HOOD FIRE SUPPRESSION SYSTEM. VERIFY LOCATION PRIOR TO INSTALLATION. COORDINATE INSTALLATION WITH ELECTRICAL AND MECHANICAL CONTRACTORS. MOUNT BELOW CEILING IN ACCESSIBLE LOCATION.
9. 1-1/2" GAS DOWN, EXPOSED ON WALL. EXTEND UNDER EQUIPMENT TO FINAL CONNECTIONS. PROVIDE PLUG VALVE, REDUCER AND AGA RATED FLEX SUPPLY AT CONNECTION.
10. CONNECT 1-1/2" NEW GAS LINE TO EXISTING GAS LINE AND METER. CONTRACTOR TO VERIFY SIZE,PRESSURE AND LOCATION OF EXISTING SERVICE, UPGRADE IF REQUIRED.



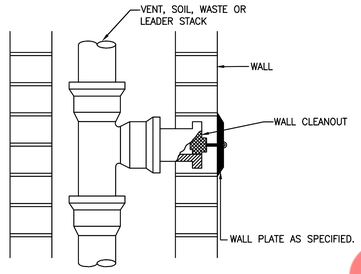
PIPE SLEEVE THRU WALL SECTION

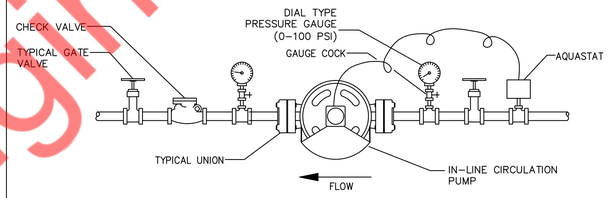


PIPE SLEEVE VIEW

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 / P–501.00 — PIPE SLEEVE THRU WALL SECTION — N.T.S

2 / P–501.00 — WALL CLEANOUT DETAIL — N.T.S

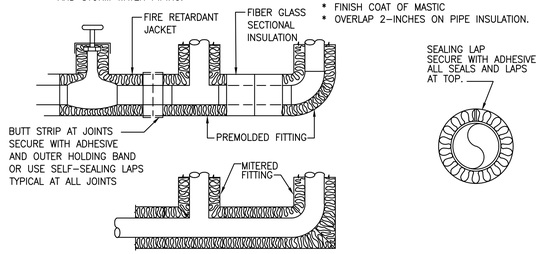
3 / P–501.00 — INLINE RECIRCULATING PUMP DETAIL — N.T.S

CONCEALED VALVES AND FITTINGS

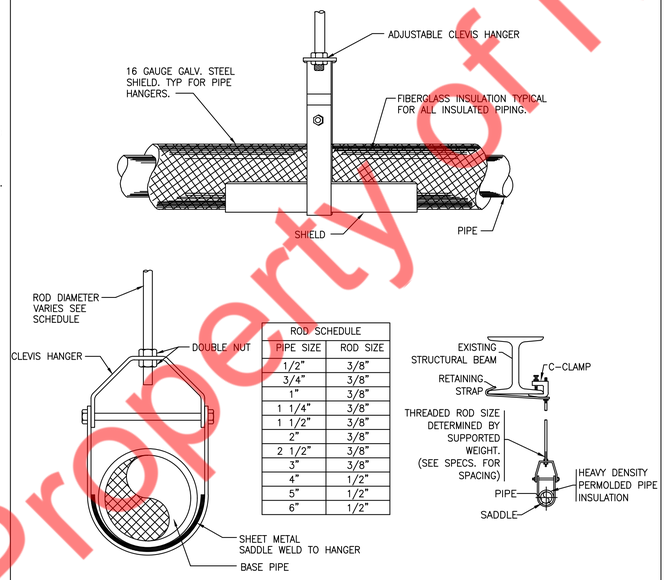
- WRAP WITH 1–INCH THICK, 1–POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS
- SECURE WITH WIRE OR TAPE.
- VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

CONCEALED VALVES AND FITTINGS

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

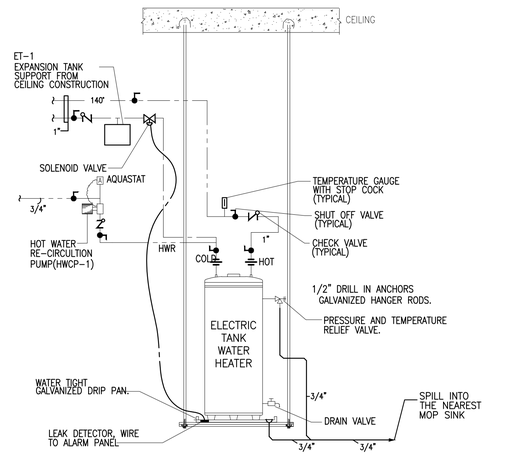


4 / P–501.00 — INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS — N.T.S



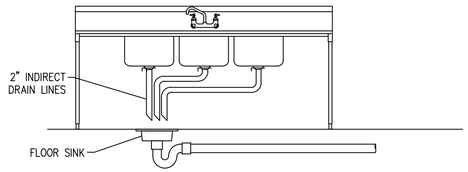
ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"

5 / P–501.00 — HANGER DETAIL — N.T.S

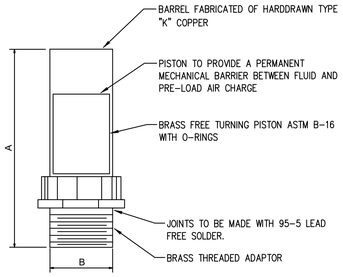


NOTE: CONTRACTOR TO CO–ORDINATE WITH STRUCTURAL ENGINEER FOR WATER HEATER MOUNTING REQUIREMENTS.

6 / P–501.00 — WATER HEATER DETAILS — N.T.S



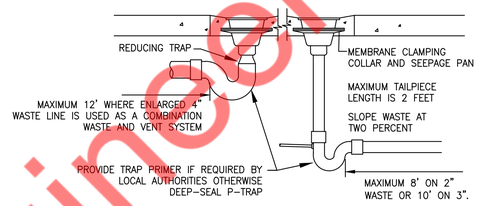
1 / P-502.00 — 3 COMPARTMENT SINK DETAILS
N.T.S



PIPE SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 – 11	5"	1/2"
3/4"	B	12 – 32	5"	3/4"
1"	C	33 – 60	7"	1"
1-1/4"	D	61 – 113	7"	1-1/4"
1-1/2"	E	114 – 154	9"	1-1/2"
2"	F	155 – 330	9"	2"

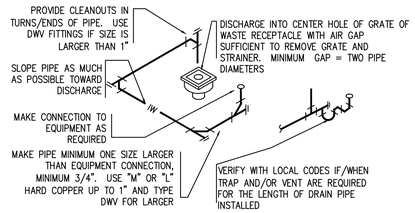
NOTE: LOCATE ONE FOR EACH BANK OF FLUSHOMETER FIXTURES AT LAST FIXTURE PROVIDE A STAINLESS STEEL ACCESS DOOR FOR EACH SUFFICIENT IN SIZE TO ALLOW REPLACEMENT OF ARRESTOR AT A FUTURE DATE.

2 / P-502.00 — WATER HAMMER ARRESTOR DETAILS
N.T.S



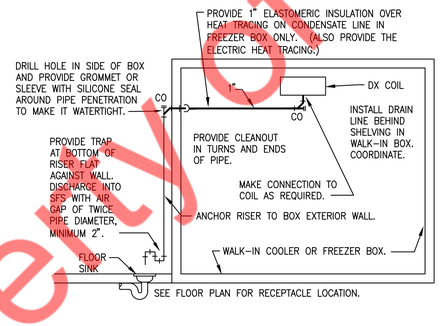
COMMENTS:
1. LOCATE FLOOR DRAIN/SINK WHERE SHOWN ON DIMENSIONED FLOOR PLAN. IF SITUATION IS FLOOR SLAB ON GRADE, SET DRAIN BODY IN PLACE, PROVIDE BACKFILL, AND POUR AROUND IT. RECESS TOP OF FLOOR DRAINS 1/2" BELOW FLOOR DATUM AND SLOPE FLOOR TO IT. DO NOT RECESS FLOOR SINKS.
2. OTHER VENTING METHODS MAY BE USED, IF APPROVED BY LOCAL CODE AND/OR LOCAL AUTHORITIES.

3 / P-502.00 — FLOOR SINK AND FLOOR DRAIN DETAILS
N.T.S



ROUTE PIPE INCONSPICUOUSLY AND UNOBTRUSIVELY. HANG PIPE AS REQUIRED. DO NOT INSULATE INDIRECT DRAIN PIPE WHEN INSTALLED EXPOSED IN FOOD SERVICE FACILITY. REFER TO LOCAL CODES FOR FURTHER INFORMATION.

4 / P-502.00 — INDIRECT WASTE DETAILS
N.T.S



5 / P-502.00 — WALK IN BOX CONDENSATE DRAIN DETAILS
N.T.S

PLUMBING FIXTURE SCHEDULE

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE – INCHES							REMARKS
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	FILTERED WATER	THERMOSTATIC MIXING VALVE	
3–CS	3–COMPARTMENT SINK	–	3"	2"	¾"	¾"	–	PROVIDE	I.W. FROM 3CS SPILLS INTO FLOOR SINK
HS–1	HAND SINK	2"	2"	2"	½"	½"	–	PROVIDE	P–TRAP
FS–1	FLOOR SINK	3"	3"	2"	–	–	–	–	P–TRAP
FD–1	FLOOR DRAIN	3"	3"	2"	–	–	–	–	P–TRAP
HD–1	HUB DRAIN	3"	3"	–	–	–	–	–	P–TRAP
WC	WALL MOUNTED WATER CLOSET	4"	4"	2"	¾"	–	–	–	FLUSH TANK
LAV	LAVATORY	2"	2"	2"	½"	½"	–	PROVIDE	P–TRAP
MS–1	MOP SINK	–	3"	2"	¾"	¾"	–	PROVIDE	P–TRAP
1–CS	1–COMPARTMENT–PREP SINK	–	3"	2"	½"	½"	–	PROVIDE	I.W. FROM 1CS SPILLS INTO FLOOR SINK
11.03	ICE/SODA DISPENSER	–	¾"	–	–	–	½"	–	DRAIN INDIRECTLY INTO FLOOR SINK
16.18	ICE MACHINE	–	¾"	–	–	–	½"	–	DRAIN INDIRECTLY INTO FLOOR SINK
15.64	FROZEN BEVERAGE DISPENSER	–	¾"	–	–	–	½"	–	–
17.56	TEA COFFEE BREWER	–	¾"	–	–	–	½"	–	–
10.81	CARBONATOR	–	¾"	–	–	–	½"	–	–

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

GREASE INTERCEPTOR SCHEDULE

ITEM	FLOW RATE (GPM)	GREASE CAPACITY (LBS)	MAKE	REMARKS
GI–1	75	861	SCHIER GB–75	DIMENSIONS– 40"(H)x47"(L)x33"(B)

NOTES: 1. CONTRACTOR SHALL SUBMIT PROPOSED GREASE INTERCEPTOR INSTALLATION PLANS AND SPECIFICATIONS TO LOCAL AUTHORITIES FOR THIER APPROVAL BEFORE ACQUISITION. SEE MANUFACTURERS INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS.
2. PROVIDE ALL ACCESSORIES FOR SATISFACTORILY WORKING OF GREASE TRAP AS PER SITE CONDITIONS.

THERMOSTATIC MIXING VALVE

TAG No.	LOCATION	SERVING	SERVICE	PIPE SIZE (INCHES)	CAPACITY RANGE (GPM)		TEMP. RANGE (°F)		MANUFACTURER & MODEL NO.	REMARKS
					MIN.	MAX.	MIN.	MAX.		
MX–1	ALL UNITS	ALL UNITS	HOT WATER	1/2	0.1	45	100	160	ACORN MODEL MV17–1	–BRASS BODY –ASSE 1017 LISTED –CSA APPROVED

HOT WATER HEATER

TAG No.	QUANTITY	SERVING	STORAGE GALLONS	RECOVERY CAP. (GPH @ RISE)	TYPE	KW INPUT	PHASE/ VOLT	MANUFACTURER & MODEL NO.	REMARKS
WH–1	1	COMMERCIAL SPACE	80	74 GPH @ 100°F	ELECTRIC STORAGE WATER HEATER	18	3/208V	A.O SMITH DVE–80	–DIMENSIONS 25.5"DIA X 60.25"H

EXPANSION TANK SCHEDULE

ITEM	QUANTITY	SERVICE	GALLONS	MAKE	REMARKS
EXPANSION TANK (ET–1)	1	HOT WATER	3.2	AMTROL ST–8	DIMENSIONS– 15"(H)x9"(DIA.) SHIPPING WEIGHT– 7 LBS

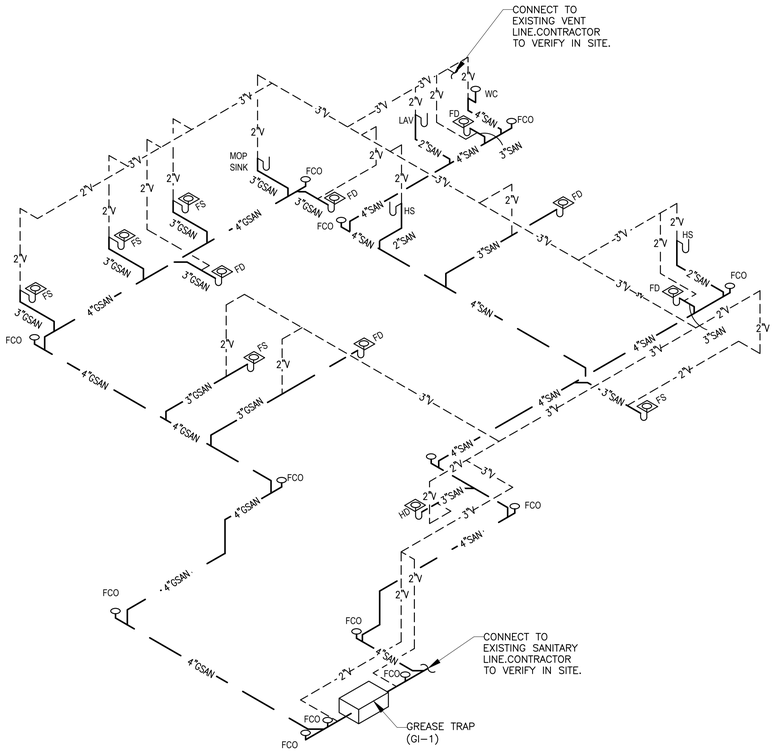
RECIRCULATING PUMP SCHEDULE

MARK	SERVICE	GPM	TOTAL HEAD FT.	MOTOR HP	MANUFACTURER & REMARKS
HWCP–1	HW RECIRCULATION	2.6	10	0.115	GRUNDFOS UPS 15–18 BUC5 W/AQUASTAT + TIMER

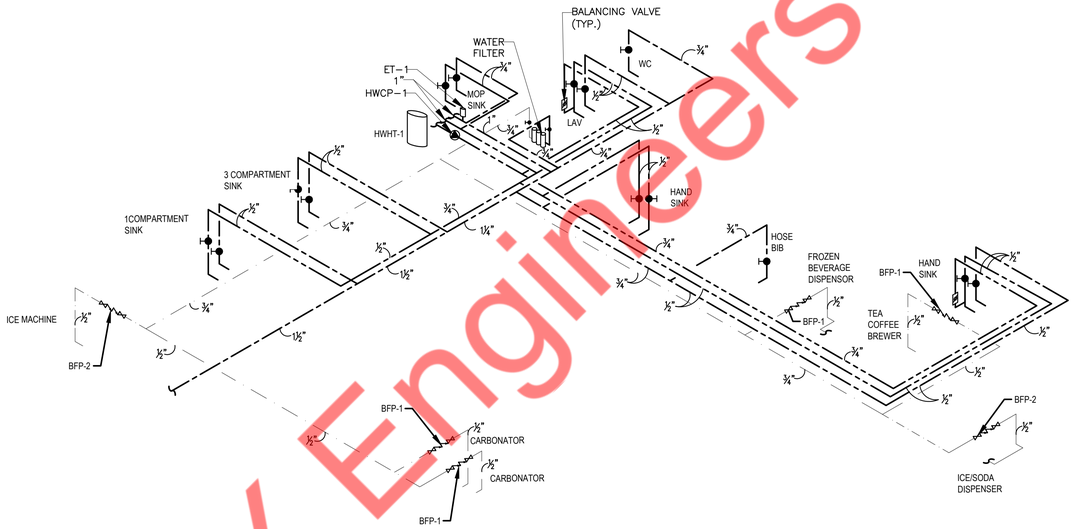
BACKFLOW PREVENTER SCHEDULE

TAG	LOCATION	MODEL	ASSE
BFP1	FROZEN BEWERAGE DISPENSER, CARBONATOR, COFFEE/TEA BREWER	WATTS SD–3 DCV	1022
BFP2	ICE MACHINE, ICE/SODA DISPENSER	WATTS LF009 RPZ	1013

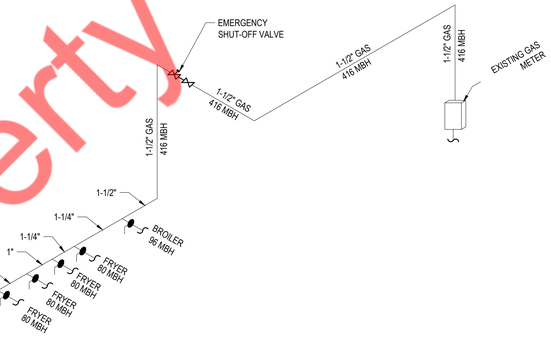
NOTE:
1. VERIFY BACKFLOW VALVE REQUIREMENTS FOR APPROVAL FOR ALL EQUIPMENT WITH AUTHORITIES HAVING JURISDICTIONS PRIOR TO INSTALLATION.
2. ENSURE ISOLATION VALVE BEFORE AND AFTER BFP FOR MAINTENANCE.



01 SANITARY RISER DIAGRAM
N.T.S



02 WATER RISER DIAGRAM
N.T.S



03 GAS RISER DIAGRAM
N.T.S

GAS LOAD SUMMARY	
EQUIPMENT	CFH LOAD
FRYER(31.02)	80X4=320
BROILER(24.44)	96
TOTAL LOAD	416

NOTE:
AS PER 2022 NYC FUEL GAS CODE TABLE 402.4(2),INLET PRESSURE LESS THAN 2 PSI WITH PRESSURE DROP OF 0.5"W.C. AT A SPECIFIC GRAVITY OF 0.60.
EQUIVALENT LENGTH OF PIPE =75 FEET+FITTINGS(+40%)=105 FEET

GAS METER AND REGULATOR BY GAS COMPANY.COORDINATE ALL REQUIREMENTS WITH GAS COMPANY.