MECHANICAL SYMBOLS LIST

	ROOF TOP UNIT
	ROOF MOUNTED MAKEUP AIR UNIT
	ROOF MOUNTED FAN
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN/EXHAUST
DUCT ACCESSORIES	
VD VD	VOLUME DAMPER W/ ACCESS DOOR
BD	BACKDRAFT DAMPER
CONTROLS AND SENSORS	
T	THERMOSTAT
S D	DUCT SMOKE DETECTOR
P	PULL STATION
H	HUMIDITY SENSOR
T S	THERMOSTAT
DUCTWORK	
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
	ROUND DUCT CROSS SECTION
	SUPPLY AIR RECTANGULAR DUCT GOING UP/DOWN
	RETURN AIR RECTANGULAR DUCT GOING UP/DOWN

CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:

A. 2024 INTERNATIONAL BUILDING CODE

B. 2024 INTERNATIONAL PLUMBING CODE

C. 2024 INTERNATIONAL MECHANICAL CODE

D. 2024 INTERNATIONAL FUEL GAS CODE

E. 2024 INTERNATIONAL ENERGY CONSERVATION CODE

F. 2024 INTERNATIONAL FIRE CODE

H 2023 NATIONAL ELECTRICAL CODE.

MECHANICAL DRAWING LIST

M0.1	MECHANICAL GENERAL SHEET
M0.2	MECHANICAL SPECIFICATION
M1.1	MECHANICAL FLOOR PLAN
M1.2	MECHANICAL ROOF PLAN
M2.1	MECHANICAL DETAILS
M3.1	MECHANICAL SCHEDULE

FIELD VERIFY ALL CONDITIONS

DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS. THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST. BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

MECHANICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
BD	GRAVITY DAMPER
CD	CONDENSATE DRAIN
CDR	CEILING DIFFUSER RETURN
CDS	CEILING DIFFUSER SUPPLY
CFM	CUBIC FEET OF AIR PER MINUTE
DN	DOWN
E	EXISTING
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
FC	FLEXIBLE CONNECTION
FD/AD	FIRE DAMPER W/ACCESS DOOR
FD	FIRE DAMPER W/FUSIBLE LINK
FSD	FIRE SMOKE DAMPER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
MD	MOTORIZED DAMPER
N	NEW
RA	RETURN AIR
RAD	RETURN AIR DUCT
RL	RELOCATE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SEER	SEASONAL ENERGY EFFICIENCY RATIO
VD	VOLUME CONTROL DAMPER

BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF INTERNATIONAL BUILDING CODE 2024 WITH ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTION 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 INTERNATIONAL BUILDING CODE 2024.
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 THE FOLLOWING SECTIONS OF THE INTERNATIONAL MECHANICAL CODE 2024:
   A. VENTILATION SYSTEM IMC 2024 – 401
   B. GREASE DUCT TEST IMC 2024 – 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 IMC 2024 – 309.1
   B. DUCT CONSTRUCTION AND INSTALLATION IMC 2024 – 603
   C. AIR INTAKES, EXHAUSTS AND RELIEF IMC 2024 – 401.5
   D. AIR FILTERS IMC 2024 – 605
   E. SMOKE DETECTION CONTROL SYSTEM IMC 2024 – 606
6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
7. VENTILATION FOR ALL AREA SHALL COMPLY WITH INTERNATIONAL MECHANICAL CODE 2024, CHAPTER 4.
8. VENTILATION SYSTEM SHALL BE BALANCED TO MAINTAIN THE MINIMUM VENTILATION AIRFLOW RATES AS SHOWN IN VENTILATION REQUIREMENT TABLE. THE SYSTEM SHALL BE BALANCED BY APPROVED METHOD. CONTRACTOR TO SUBMIT THE AIR BALANCE REPORT TO INSPECTOR OF RESPECTIVE BUILDING DEPARTMENT PRIOR TO FINAL INSPECTION.
9. 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 INTERNATIONAL MECHANICAL CODE 2024– 403.
10. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE–RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
11. 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.
12. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
13. SMOKE DETECTOR SHALL MEET UL268A.
14. 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 2024 IMC – 403.3. HVAC SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS AS REQUIRED.
15. HVAC AND SERVICE WATER HEATING CONTROLS SHALL BE TESTED TO DOCUMENT THAT CONTROL DEVICES, COMPONENT, EQUIPMENT AND SYSTEM ARE CALIBRATED AND OPERATE IN ACCORDANCE WITH APPROVED PLANS AND SPECIFICATION.
16. AIR BALANCING REPORT SHALL BE PROVIDED IN ACCORDANCE WITH 2024 IMC.
17. MECHANICAL SYSTEM SHALL BE COMMISSIONED PER 2024 ENERGY CONSERVATION CODE. FINAL COMMISSIONING REPORT SHALL BE DUE WITHIN 90 DAYS OF RECEIPT OF CERTIFICATE OF OCCUPANCY.

THERMOSTATIC CONTROL NOTES

C403.4.1 THERMOSTATIC CONTROLS (MANDATORY)
THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

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

1. THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM).
2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.

C403.4.1.2 DEADBAND (MANDATORY)
WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL:

1. HAVE SEPARATE SETPOINTS FOR HEATING AND COOLING, EACH INDIVIDUALLY ADJUSTABLE.
2. BE CAPABLE OF AND INITIALLY CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND BETWEEN THE TWO SETPOINTS OF NOT LESS THAN 5°F (3°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.
3. HAVE A MINIMUM DEADBAND OF NOT LESS THAN 1°F (0.56°C) WHEN SETPOINTS ARE ADJUSTED.

EXCEPTIONS:

1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
2. OCCUPANCIES OR APPLICATIONS WHERE APPLICABLE CODES OR ACCREDITATION STANDARDS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL SHALL BE PERMITTED TO BE INITIALLY CONFIGURED TO NOT LESS THAN 1°F (0.56°C) DEADBAND.

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.

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:

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

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).

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.

C403.4.2.3 OPTIMUM START AND STOP
OPTIMUM START AND STOP CONTROLS SHALL BE PROVIDED FOR EACH HEATING AND COOLING SYSTEM WITH DIRECT CONTROL OF INDIVIDUAL ZONES. THE OPTIMUM START CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HEATING AND COOLING SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY. THE OPTIMUM STOP CONTROLS SHALL BE CONFIGURED TO REDUCE THE HEATING AND COOLING SYSTEM'S HEATING TEMPERATURE SETPOINT AND INCREASE THE COOLING TEMPERATURE SETPOINT BY NOT LESS THAN 2°F (1.11°C) BEFORE SCHEDULED UNOCCUPIED PERIODS BASED ON THE THERMAL LAG AND ACCEPTABLE DRIFT IN SPACE TEMPERATURE THAT IS WITHIN COMFORT LIMITS.

EXCEPTION: DWELLING UNITS AND SLEEPING UNITS ARE NOT REQUIRED TO HAVE OPTIMUM START CONTROLS.

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. 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.
12. WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.
13. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
14. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.
15. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.
16. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION–FREE INSTALLATION.
17. ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C–CLAMPS SHALL NOT BE PERMITTED.
18. ALL ROOF–MOUNTED EQUIPMENT CURBS/STEEL RAILS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
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.

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.

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A PROJECT OF:
ANGIES FOOD CONCEPTS,

SPECIFICATIONS

SECTION 0001 – NOTICE TO BIDDERS

1.1 BIDDERS REPRESENTATIONS

A. THE BIDDER BY MAKING A BID REPRESENTS THAT:

B. 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.

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

D. 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.

E. 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.

F. 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 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 SHUTDOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE–ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUTDOWNS 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 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.

1.5 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:

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

B. 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 ONE OR MORE OF THE FOLLOWING MATERIALS:

a. LATEX SEALANT

b. SILICONE SEALANT

c. MORTAR

d. SILICONE FOAM

e. PILLOWS/BAGS

f. INTUMESCENT WRAP STRIPS

1.6 MANUFACTURERS

A. HILTI CONSTRUCTION CHEMICAL, INC

B. 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 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS

A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.

B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.

1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND
3. DESIGN SEISMIC–RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.

1.2 SUBMITTALS

A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

1.3 QUALITY ASSURANCE

A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE – STEEL."

1.4 COMPONENTS

A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL

B. FIBERGLASS PIPE HANGERS: –CLEVIS, CENTURY COMPOSITES, COOPER B–LINE

C. METAL FRAMING SYSTEMS: MFMA MANUFACTURER

D. FIBERGLASS STRUT SYSTEMS: COOPER B–LINE

E. THERMAL–HANGER SHIELD INSERTS:

F. FASTENER SYSTEMS: POWDER–ACTUATED FASTENERS OR MECHANICAL–EXPANSION ANCHORS

G. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB–MOUNTED TYP EQUIPMENT SUPPORTS.

END OF SECTION 230529

SECTION 230548 – VIBRATION CONTROLS FOR PIPING AND 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. COOPER B–LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
4. HILTI, INC.
5. ISOLATION TECHNOLOGY, INC.
6. KINETICS NOISE CONTROL.

END OF SECTION 230548

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

1. MOTORS.
2. CONDENSING UNITS.
3. AIR SYSTEM: 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 SSECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.

G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.

H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.

I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.

J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 233713 – DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

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

B. MANUFACTURERS: PRICE

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:

a. HART & COOLEY INC.

b. KRUEGER.

c. METALAIRE, INC.

d. RUSKIN

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

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

END OF SECTION 233713

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 1 INCH WG PRESSURE, SEAL CLASS "A".

B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

1. CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH. USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK. USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
2. SHEET STEEL SHALL COMPLY WITH ASTMA653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY–COATED (GALVANNEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALIC–COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
3. USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5 WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3. WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31, USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT–RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.
4. WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
5. PROVIDE EXPANDED TAKE–OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90–DEGREE TAKE–OFF FITTINGS OR TRAIGHT TAPS WILL NOT BE ACCEPTED.
6. BUTTON PUNCH SNAP–LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.

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:

SUPPORT SCHEDULE – DUCTWORK

USG MAX SIDE INCHES	TRANSVERSE JOINT AND BRACING
22	UP TO 12 S SLIP, DRIVE, ONE INCH POCKET ON 8 FOOT
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 OF RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS

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

1.2 MATERIALS

A. SINGLE–WALL RECTANGULAR DUCTS AND FITTINGS.

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

C. SHEET METAL MATERIALS:

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

D. DUCT LINER:

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

E. SEALANT MATERIALS:

3. TWO–PART TAPE SEALING SYSTEM.
4. WATER–BASED JOINT AND SEAM SEALANT.
5. SOLVENT–BASED JOINT AND SEAM SEALANT.
6. FLANGED JOINT SEALANT.
7. FLANGE GASKETS.
8. ROUND DUCT JOINT O–RING SEALS.

1.3 DUCT CLEANING

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

B. CLEAN THE FOLLOWING ITEMS:

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

1.4 DUCT SCHEDULE

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

1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

SECTION 230713 – INSULATION

INSULATION – GENERAL REQUIREMENTS

A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E–84), (ASA A2.5–1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.

B. DEFINITIONS:

1) EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.

2) CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.

3) OUTDOOR: DUCTS, PIPING OR EQUIPMENT WHICH IS EXPOSED TO THE WEATHER.

DUCTWORK INSULATION

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

INSULATION SCHEDULE – DUCTWORK

SERVICE	LOCATION	R–VALUE	TYPE	FINISH
SUPPLY/RETURN	UNCONDITIONED	R–6	D–1	VAPORSEAL
INTAKE	ALL	R–8	D–1	VAPORSEAL
SUPPLY	EXTERIOR	R–8	D–1	VAPORSEAL
KITCHEN EX.	INTERIOR	1.5" (2 LAYER)		3M FIRE MASTER DUCT WRAP

B. REINSULATE ALL DUCTWORK AND PIPING WHICH IS EXISTING TO REMAIN AND WAS DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED. INSULATE WITH SAME MATERIAL AND THICKNESS.

C. NON–INSULATED DUCTWORK:

1) WHERE SOUND LINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION.

2) AIR CONDITIONING RETURN AIR DUCTWORK EXPOSED IN AIR CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACE IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.MATERIAL:

D. MATERIAL:

1) TYPE D–1: MINIMUM 1–LB DENSITY FIBERGLASS BLANKET, MAXIMUM 0.28 K–FACTOR AT 75 ADEG F MEAN TEMPERATURE WITH FACTORY–APPLIED FOIL–SKRIM–KRAFT FACING SIMILAR TO MANVILLE MICROLITE.

2) TYPE D–2: 3 LB. FIBERGLASS BOARD. THE MAXIMUM K FACTOR SHALL BE 0.23 AT 75 DEG F MEAN TEMPERATURE WITH A MINIMUM DENSITY OF 3 LB. THE INSULATION SHALL BE PROVIDED WITH A FACTORY–APPLIED ALL PURPOSE OR ALL SERVICE FACING. THE INSULATION SHALL BE EQUAL TO MANVILLE TYPE 814 SPIN–GLAS AP.

3) TYPE D–3: MINIMUM 6 LB FIBERGLASS BOARD. MAXIMUM 0.22 K–FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY APPLIED ALL PURPOSE OR ALL SERVICE FACING. SIMILAR TO MANVILLE 817 SPIN–GLAS AP

E. 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.

F. INSTALLATION:

a. FIBERGLASS BLANKET: 2 IN. LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 IN. WIDE WITH MIN 2 ROWS OF WELD PINS 12 IN. ON CENTER. SECURE ALL SEAMS WITH FOIL VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.

b. FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 IN. WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 IN. WIDE TAPE AT CORNERS, WELD PINS ON TOP, SIDES AND BOTTOM.

G. ACOUSTICAL TREATMENT

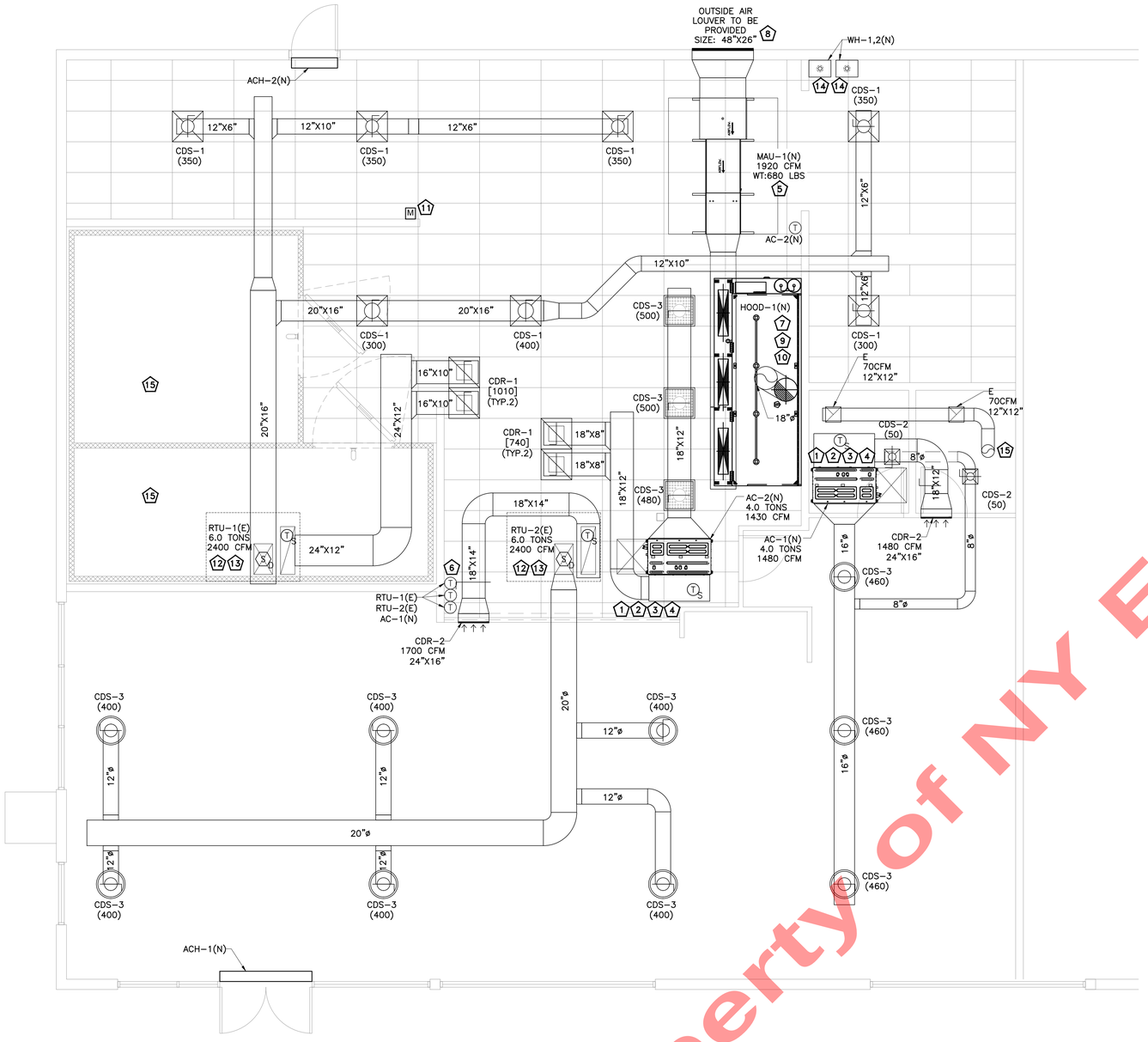
ACOUSTICALLY LINE THE FIRST 10'–0" OF BOTH SUPPLY AND RETURN MAIN DUCTS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R–6 AS MANUFACTURED BY DUCTMATE, 1–1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD 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.

Bid Set Only Not For Construction

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	PERMIT SET

SHEET:
M0.2



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

MECHANICAL GENERAL NOTES:

A. REFER TO THE ARCHITECTURAL DRAWING FOR THE EXACT LOCATION AND MOUNTING HEIGHT OF VARIOUS EQUIPMENT. ALL SUCH EQUIPMENT AND EQUIPMENTS COLORS AND FINISH SHALL BE COORDINATED WITH THE ARCHITECT, MOUNTING HEIGHT SHALL BE APPROVED BY THE ARCHITECT.

B. CONTRACTOR SHALL BALANCE EACH AIR TERMINAL WITH THE CFM SHOWN ON PLANS.

C. DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR DUCTWORK ROUTING. OFFSET AND RUN DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.

D. ALL FLEX DUCT SHALL COMPLY WITH ALL LOCAL CODES, UL LISTED. R-6. FOIL-BACKED, CLASSIFIED AS A CLASS 1 AIR DUCT. MAXIMUM LENGTH SHALL BE AS PER LOCAL MECHANICAL CODE.

E. COORDINATE LOCATIONS AND SIZES OF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.

F. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.

G. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS. ALLOW FOR DUCT INSULATION.

H. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

I. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

J. PROVIDE 1.5" THICK R-6 FOIL FACE INSULATION (INTERNAL FOR EXPOSED DUCTS AND EXTERNAL FOR CONCEALED DUCTS) FOR SUPPLY & RETURN AIR DUCTS. PROVIDE ACOUSTIC INSULATION ON MAIN SUPPLY AND RETURN DUCTS UP TO 10 FT. FROM HVAC UNIT.

K. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS/SLABS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.

L. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS AND TRADES.

M. CONTRACTOR SHALL PROVIDE ALL REQUIRED HVAC PERMITS SHALL COMPLY WITH ALL STATE AND LOCAL CODES.

N. THE CONTRACTOR SHALL PROVIDE WRITTEN GUARANTEE THAT SHALL WARRANT ALL WORKMANSHIP AND MATERIAL FOR ONE (1) YEAR FROM THE FINAL WORK ACCEPTANCE BY THE OWNER.

O. ANY CHANGES AND/ OR UPGRADES TO TENANT'S EXISTING MECHANICAL SYSTEMS SHALL COMPLY WITH ALL CODES. EXISTING SYSTEMS SHALL POSSESS THE CAPACITY TO HANDLE ANY AND ALL CHANGES IN LOAD.

P. AT CONCLUSION OF PROJECT, HVAC SYSTEM MUST BE TESTED AND BALANCED BY A LICENSED CONTRACTOR. COPY OF BALANCE REPORT MUST BE PROVIDED TO ARCHITECT/OWNER ON-SITE.

Q. THE CONTRACTOR SHALL COORDINATE DIFFUSER LOCATIONS ON SITE WITH THE MOST RECENT REFLECTED CEILING PLAN.

R. THE CONTRACTOR IS TO MAKE ALL LOW-VOLTAGE WIRING CONNECTIONS FOR ALL HVAC EQUIPMENT, INCLUDING TEMPERATURE CONTROLS, ROOF TOP UNITS, SMOKE DETECTORS, AND CONTRACTOR PANEL.

S. ALL WORK SHALL BE SUBJECT TO THE ACCEPTANCE AND APPROVAL OF THE ARCHITECT AND OWNER. THE ARCHITECT SHALL BE NOTIFIED OF ANY AND ALL DISCREPANCIES BETWEEN FIELD CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE OR PROPER NOTIFICATION DOES NOT RELIEVE THE CONTRACTOR. THE CONTRACTOR SHALL CORRECT ANY AND ALL WORK ARISING FROM SUCH FAILURE TO COORDINATE DISCREPANCIES TO THE SATISFACTION OF THE ARCHITECT WITHOUT ADDITIONAL COST TO THE OWNER.

T. THE CONTRACTOR SHALL, UPON COMPLETION OF THE PROJECT, PERFORM A COMPLETE TEST AND BALANCE OF ALL EQUIPMENT. PROVIDE A WRITTEN REPORT TO THE ARCHITECT. ALL CAPACITIES MUST BE SET TO WITHIN ±10% OF THE AMOUNTS INDICATED ON THE FLOOR PLANS AND SCHEDULES.

U. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF TRUSSES AND MODIFY DUCTWORK ACCORDINGLY.

V. PROVIDE CORD-OPERATED DAMPERS IN INACCESSIBLE CEILINGS.

W. PROVIDE 1.5" FIRE WRAP (TWO LAYERS) TO KITCHEN EXHAUST DUCT AS PER THE MANUFACTURER'S RECOMMENDATIONS.

X. INSTALL SPIRAL/ROUND DUCTWORK IN OPEN AREAS AND RECTANGULAR DUCTWORK IN CEILING AREAS. PROVIDE INTERNAL INSULATION FOR EXPOSED DUCTWORK AND EXTERNAL INSULATION FOR DUCTWORK LOCATED IN CEILING SPACES.

MECHANICAL KEY NOTES:

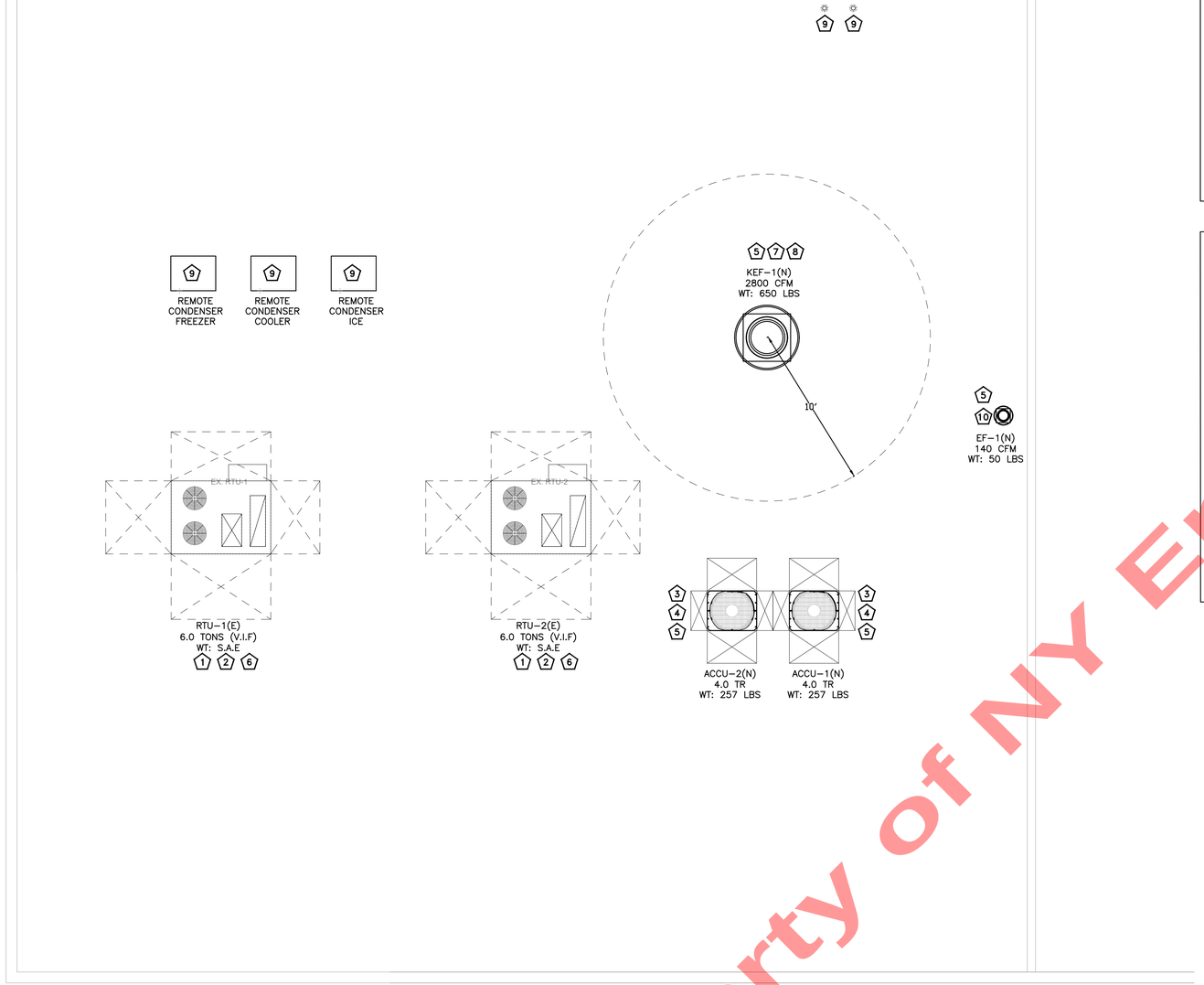
1. CONNECT THE 1"Ø CONDENSATE DRAIN FROM AC-1(N), AC-2(N) UNIT TO NEAREST PLUMBING DRAIN OR APPROVED PLACE OF DISPOSAL AS PER LOCAL CODE WITH AIR GAP FITTING. PROVIDE CONDENSATE DRAIN PUMP IF REQUIRED. PROVIDE SECONDARY DRAIN PAN WITH WATER LEAK BUG SENSOR TO SHUT DOWN THE UNIT IN CASE OF LEAKAGE.
2. PROVIDE HORIZONTAL SLOPE IN THE DIRECTION OF DISCHARGE OF NOT LESS THAN 1/8 UNIT VERTICAL IN 12 UNITS HORIZONTAL.
3. CONTRACTOR SHALL PROVIDE FIELD MANUFACTURED FILTER RACK AT THE UNIT INLET. COORDINATE WITH ARCHITECT FOR ACCESS DOOR FOR FILTER.
4. ROUTE THE REFRIGERANT LINES BETWEEN CONDENSER AND INDOOR UNITS. PROVIDE THE CEILING SLAB OPENING FOR REFRIGERANT PIPES AS PER THE DIMENSION MENTIONED IN THE PLAN. SIZE OF THE REFRIGERANT PIPE AS PER MANUFACTURER'S INSTRUCTIONS.
5. THE MAU-1(N) SHALL BE INTERLOCKED WITH THE KITCHEN EXHAUST HOOD SYSTEM AND ENSURE THAT THE MAU-1(N) ONLY OPERATES WHEN THE EXHAUST FAN IS WORKING.
6. EXISTING THERMOSTAT AND SENSORS TO BE RE-USED. CONTRACTOR TO VERIFY IN FIELD, REPLACE IN KINDS IF DAMAGED. LOCATION OF DIGITAL THERMOSTAT CONTROL. INSTALL AND WIRE NEW 7-DAY PROGRAMMABLE THERMOSTAT. COORDINATE THE EXACT LOCATION WITH ARCHITECT AND OWNER PRIOR TO ROUGH-IN PROVIDE LOCKABLE COVER. COORDINATE WITH ARCHITECT/OWNER FINAL LOCATION OF THE NEW THERMOSTAT PRIOR ROUGH-IN.
7. CONTRACTOR TO FIELD VERIFY & INSTALL THE HOOD AS PER MANUFACTURER RECOMMENDATION.
8. CONTRACTOR TO PROVIDE THE OUTSIDE AIR LOUVER 48X26 OR 8.6 SQ.FT OF FREE AREA.
9. GREASE DUCT TO BE PROVIDED WITH KITCHEN EQUIPMENT AND INSTALLED BY MECHANICAL CONTRACTOR. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS AS PER 2024 IMC AND ASHRAE 154 (2016). INSTALL OWNER FURNISHED UL-2221 LISTED DOUBLE-WALL GREASE DUCT EQUAL TO CAPTIVEAIRE SYSTEMS MODEL DW-2R ROUND 20 GAUGE 430 STAINLESS STEEL INNER DUCT INSULATED WITH A 24 GAUGE OUTER SHELL FROM HOOD COLLAR TO EXHAUST FAN ON ROOF. INSTALL EXHAUST DUCT AS PER MANUFACTURER'S INSTRUCTIONS. PROVIDE CLEANOUTS AT EVERY CHANGE OF DIRECTION IN THE DUCT AND EVERY 10 FEET WITH MINIMUM OF 3 FEET OF CLEARANCE IN FRONT OF CLEAN-OUT. COORDINATE EXACT DUCT LENGTHS REQUIRED BASED ON FIELD CONDITIONS WITH MANUFACTURER.
10. 18"ø GREASE EXHAUST DUCT FROM HOOD-1(N) UP TO ROOF LEVEL AND CONNECT WITH KEF-1(N).
11. PROVIDE AND INSTALL EMERGENCY MANUAL SHUTDOWN PUSH BUTTON FOR HOOD-1(N). PUSH BUTTON SHALL BE IN THE PATH OF EGRESS, A MINIMUM OF 10 FT. AWAY FROM THE HOOD AND A MAXIMUM OF 20 FT.
12. APPROXIMATE LOCATION OF EXISTING DUCTWORK DROPS FROM RTUs. MODIFY/EXTEND AS REQUIRED IN PREPARATION FOR NEW DUCTWORK SYSTEM AS SHOWN ON PLAN. CONTRACTOR TO VERIFY EXACT SIZE AND CONNECTION POINT IN FIELD PRIOR TO BID AND START THE WORK.
13. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNITS TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY & RETURN MAIN DUCTS.
14. PROVIDE A 3"Ø VENT FOR COMBUSTION AIR INTAKE AND EXHAUST FROM GAS-FIRED WATER HEATERS, TERMINATED AT THE ROOF LEVEL USING THE MANUFACTURER-RECOMMENDED TERMINATION KIT. ROUTE VENT PIPING WITH THE MINIMUM NUMBER OF BENDS AND SHORTEST POSSIBLE LENGTH IN ACCORDANCE WITH THE RESPECTIVE UNIT MANUFACTURER'S REQUIREMENTS. MAINTAIN A MINIMUM CLEARANCE OF 10'-0" FROM ANY OUTSIDE AIR INTAKE AND 3'-0" FROM ANY OPERABLE BUILDING OPENING. CONTRACTOR SHALL COORDINATE ROUTING AND TERMINATION LOCATIONS BASED ON ACTUAL SITE CONDITIONS.
15. WALK-IN COOLER AND FREEZER UNIT, ALONG WITH REMOTE CONDENSER UNITS SHALL BE PROVIDED BY OTHERS AND INSTALLED BY GC.
16. 8"ø TOILET EXHAUST DUCT FROM RESTROOM UP TO ROOF LEVEL AND CONNECT WITH EF-1(N).

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

N

MECHANICAL GENERAL NOTES:

A. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND WITH A STRUCTURAL ENGINEER.

B. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.

C. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

D. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

E. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.

F. COORDINATE ALL EQUIPMENT WITH STRUCTURAL.

G. MAINTAIN ALL CODE AND MANUFACTURERS RECOMMENDED CLEARANCE AROUND ALL ROOF EQUIPMENT.

H. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR DUCTING.

I. CONTRACTOR SHALL PROVIDE A 42" HIGH GUARDRAIL FOR ALL ROOF MOUNTED MECHANICAL EQUIPMENT REQUIRING SERVICE THAT IS LOCATED WITHIN 10 FEET OF A ROOF EDGE OR OPEN SIDE WITH A VERTICAL DROP EXCEEDING 30 INCHES. GUARDRAIL SHALL EXTEND 30 INCHES BEYOND EACH END OF THE EQUIPMENT AND COMPLY WITH IBC SECTION 1015.6 AND APPLICABLE LOCAL CODE REQUIREMENTS.

(#) MECHANICAL KEY NOTES:

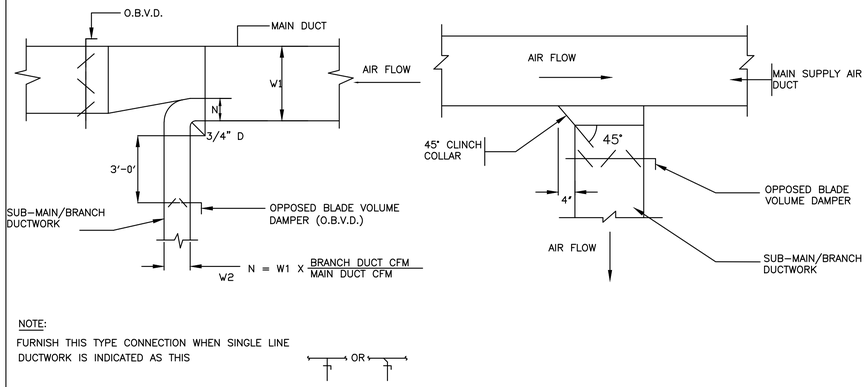
1. EXISTING MECHANICAL ROOFTOP UNIT TO REMAIN ALONG WITH ALL ACCESSORIES. CLEAN AND REFURBISH TO LIKE NEW CONDITION. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE FULLY FUNCTIONING VERIFY PRIOR TO BID. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION ON SITE.
2. CONDENSATE DRAIN TO BE REMAIN AS IT IS FOR EXISTING RTU. CONTRACTOR TO FLUSH THE EXISTING DRAIN. CONTRACTOR TO CLEAN/REPAIR/REPLACE DRAIN IF FOUND DAMAGED.
3. CONTRACTOR TO FURNISH AND INSTALL THE CONDENSING UNIT MOUNTING ON STEEL RAILS AS PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO COORDINATE FINAL LOCATION WITH CLIENT AND ARCHITECT.
4. INSTALL NEW REFRIGERANT PIPING BETWEEN INDOOR AND OUTDOOR UNIT AS PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE WEATHER PROOF COATING FOR EXPOSED PIPING. PROVIDE INSULATION TO REFRIGERANT PIPING AS PER ASHRAE 90.1(2019).
5. COORDINATE THE FINAL LOCATION OF THE MECHANICAL EQUIPMENT WITH THE STRUCTURAL DRAWINGS.
6. SET OUTSIDE AIR AS INDICATED ON ROOFTOP UNIT SCHEDULES. MECHANICAL CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENT OF OUTSIDE AIR. CONTRACTOR TO FIELD VERIFY THAT LOCATION OF ANY EXHAUST SOURCE SHOULD BE AT LEASE 10' AWAY FROM THE RTU'S OUTSIDE AIR INTAKE.
7. KITCHEN EXHAUST FAN KEF-1(N) DISCHARGE SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM OR NOT LESS THAN 3 FEET ABOVE AIR INTAKE OPENINGS INTO ANY BUILDING. EXHAUST AIR DISCHARGE OPENING LOCATED 40 INCHES ABOVE THE ROOF SURFACE
8. KITCHEN EXHAUST TERMINATION SHALL EXTEND 40" ABOVE THE ROOF SURFACE, BE LOCATED A MINIMUM OF 3 FEET FROM ANY OPENING INTO THE BUILDING, AND A MINIMUM OF 10 FEET FROM ANY OUTSIDE AIR INTAKE.
9. TERMINATE WATER HEATER CONCENTRIC VENT KIT AS PER MANUFACTURER RECOMMENDATION WITH ALL REQUIRED ACCESSORIES AND TERMINATE A MINIMUM OF 36" ABOVE THE ROOF.
10. TOILET EXHAUST FAN EF-1(N) SHALL TERMINATE A MINIMUM OF 3 FEET FROM THE PROPERTY LINE, 3 FEET FROM ANY OPERABLE OPENING INTO THE BUILDING, AND 10 FEET FROM ANY OUTSIDE AIR INTAKE OPENING.

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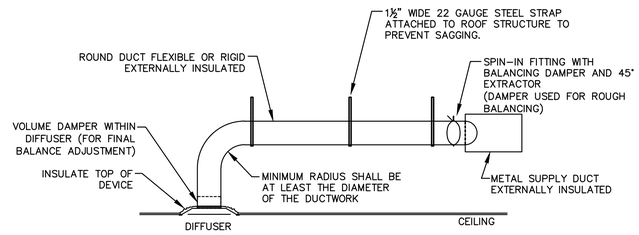
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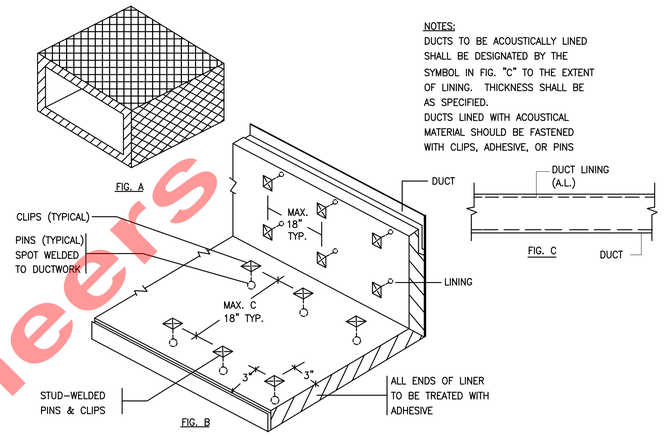


NOTE:
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE DUCTWORK IS INDICATED AS THIS OR

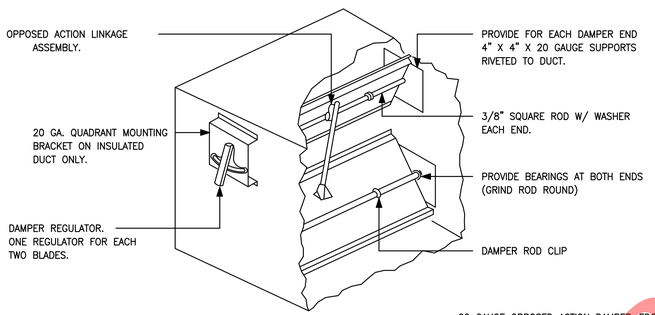
1 DUCTWORK SUB-MAIN/BRANCH TAKE-OFF DETAIL
N.T.S



2 TYPICAL DIFFUSER CONNECTION DETAIL
N.T.S

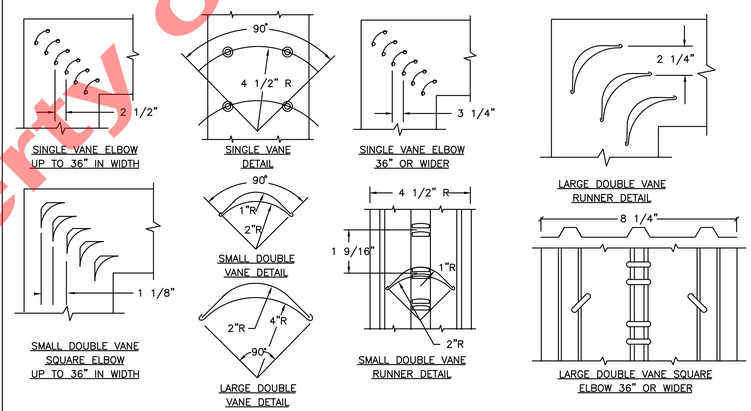


3 ACOUSTICAL TREATMENT DUCT LINING
N.T.S

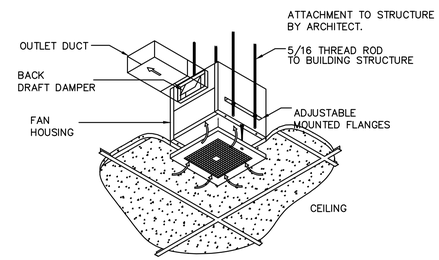


NOTE : 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

4 LOW PRESSURE BALANCING DAMPER
N.T.S



5 LOW VELOCITY DUCTWORK ELBOWS
N.T.S



6 CEILING MOUNTED EXHAUST FAN DETAIL
N.T.S

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ROOF TOP UNIT SCHEDULE

UNIT ID	MANUFACTURER	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			COOLING				HEATING		ELECTRICAL				OPERATING WEIGHT (LBS)
					TOTAL CFM	OUTSIDE AIR CFM	EXTERNAL STATIC PRESSURE(IN. W.G.)	TOTAL MBH	SENSIBLE MBH	EFFICIENCY EER	EFFICIENCY IEER	TOTAL MBH	EFFICIENCY COP	VOLTS	PHASE	MCA(A)	MOCP(A)	
RTU-1 (E)	INTERNATIONAL COMFORT PRODUCTS, LLC (V.I.F.)	RHS072H0CA0AATB (V.I.F.)	SEE ON PLAN	6.0 (V.I.F.)	2400 (V.I.F.)	600	1.0 (V.I.F.)	69 (V.I.F.)	S.A.E	11.1 (V.I.F.)	12.7 (V.I.F.)	66.6 (V.I.F.)	3.5 (V.I.F.)	208/230 (V.I.F.)	3 (V.I.F.)	35 (V.I.F.)	50 (V.I.F.)	741 (V.I.F.)
RTU-2 (E)	INTERNATIONAL COMFORT PRODUCTS, LLC (V.I.F.)	RHS072H0CA0AATB (V.I.F.)	SEE ON PLAN	6.0 (V.I.F.)	2400 (V.I.F.)	600	1.0 (V.I.F.)	55 (V.I.F.)	51.1 (V.I.F.)	14.3 (V.I.F.)	14.3 (V.I.F.)	44.6 (V.I.F.)	14.3 (V.I.F.)	208 (V.I.F.)	3 (V.I.F.)	29 (V.I.F.)	40 (V.I.F.)	741 (V.I.F.)

NOTES FOR EXISTING RTU:-

1. S.A.E. : SAME AS EXISTING , V.I.F.: VERIFY IN FIELD
2. EXISTING RTUs WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
3. CONTRACTOR TO FIELD VERIFY IF ALL RTUs ARE WORKING AT THEIR 100% RATED CAPACITY. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.
5. IF REQUIRED, PROVIDE NEW THERMOSTAT AND TEMPERATURE SENSOR COMPATIBLE WITH EXISTING RTU. CO-ORDINATE FINAL LOCATION OF T-SENSOR WITH ARCHITECT/OWNER.
6. CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPER ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLES.
7. REPLACE FILTERS, IF REQUIRED.
8. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKER, DISCONNECT ETC. PRIOR TO ORDERING AND BID.
9. CONTRATOR TO REPLACE EXISTING SMOKE DETECTOR IF NOT REUSABLE.

FAN SCHEDULE

MARK	MANUFACTURER	MODEL	TYPE	AREA SERVED	FAN					ELECTRICAL					APPROXIMATE WEIGHT (LBS)	ACCESSORIES	NOTES
					AIRFLOW (CFM)	EXTERNAL STATIC (IN. W.G.)	DRIVE TYPE	HP	BHP	VOLTAGE	PHASE	MCA	MOCP	FLA			
KEF-1 (N)	CAPTIVEAIRE	DU180HFA	ROOF MOUNTED	HOOD-1 (N)	2800	1.50	DIRECT	3.00	1.46	208	3	-	-	19.4	647	BD, DP, FSC, VI	1,2
EF-1 (N)	GREENHECK	CUE-080-VG	ROOF MOUNTED	RESTROOMS	140	0.50	DIRECT	-	0.04	115	1	1.9	15	1.5	48	BD, DP, FSC, VI	3,4

ACCESSORIES:

BD-BACKDRAFT DAMPER, DP-DISCONNECT PLUG, GDC- GREASE DRAIN CUPRC-FACTORY FURNISHED 18" ROOF CURB, FSC-FACTORY MOUNTED AND WIRED VARIABLE SPEED CONTROL, VI-VIBRATION ISOLATION, WP-NEMA 3R DISCONNECT SWITCH, MD-MOTORISED DAMPER

NOTES:

1. FAN SHALL BE CONTROLLED BY HOOD CONTROLS. INTERLOCK MAU-1(N) TO OPERATE IN OCCUPIED MODE WHILE KITCHEN EXHAUST FAN IS ENERGIZED.
2. REFER TO CAPTIVEAIRE DRAWINGS FOR ADDITIONAL INFORMATION.
3. INTERLOCK FAN OPERATION WITH RESTROOM LIGHTING.
4. ACCEPTED ALTERNATE MANUFACTURER'S SHALL BE CARNES, COOK, AND PENN.

INDOOR UNITS SCHEDULE

MAKE:- LG/EQUIVALENT

UNIT TAG	LOCATION	TYPE	CAP. (TON)	COOLING (MBH)	HEATING (MBH)	OA CFM	TOTAL CFM	MAX RATED ESP. (IN. WG)	MAX. SOUND PRESS.(DBA)	ELECTRICAL DATA		DIMENSIONS (HXWXD) (IN.)	PIPE SIZE			WEIGHT (LBS.)	MODEL NO.
										AMPS	PH/VOLT/HZ	UNIT	LIQ.	SUCTION	DRAIN (ID)		
AC-1(N)	SEE PLAN	R32 MULTI V™ MID STATIC DUCTED	4	48.1	54.2	50	1480	0.79	42	2.5	208-230 / 60 / 1	14"x27"x51"	3/8"	5/8"	1"	94	ZRNU483M3AA
AC-2(N)	SEE PLAN	R32 MULTI V™ MID STATIC DUCTED	4	48.1	54.2	50	1480	0.79	42	2.5	208-230 / 60 / 1	14"x27"x51"	3/8"	5/8"	1"	94	ZRNU483M3AA

NOTES:

1. SUPPLY AIR CFM BASED ON HIGH SPEED.
2. REFRIGERANT R32 SHALL BE PROVIDED.
3. PROVIDE ALL MOUNTING BRACKET AND ALL ASSOCIATED ACCESSORIES.
4. ALL REFRIGERANT PIPING SHALL BE SIZED AS PER MANUFACTURERS RECOMMENDATIONS.
5. PROVIDE FILTER ON ALL RETURNS TO UNIT.
6. SEE FLOOR PLAN FOR QUANTITIES.
7. INDOOR UNIT ACCESS PANEL FILED-PROVIDED.
8. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEED THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
9. PROVIDE ELECTRICAL POWER TO THE INDOOR UNIT FROM THE OUTDOOR UNIT AS PER MANUFACTURER RECOMMENDATIONS.

OUTDOOR UNITS SCHEDULE

UNIT TAG	NUMBER OF MODULES	LOCATION	INDOOR UNIT SERVED	CAP.TR	COOLING MBH	HEATING MBH	COMPRESSOR TYPE	UNIT DIMENSIONS IN.(HXWXD)	WEIGHT (LBS)	PIPING DIMENSION		ELECTRICAL				DUCTED		MODEL NO.
										LIQUID-HI PRESSURE	GAS HIGH-PRESSURE	(V/Hz/Ph)	MCA (A)	MOP (A)	SOUND LEVEL (dBA)	EER2	SEER2	
ACCU-1(N)	1	SEE PLAN	AC-1(N)	4	48	54	HERMETICALLY SEALED SCROLL	54"x13"x37"	257	3/8"	5/8"	208-230V/60/1	31	40	54	12.2	17	ZRUM048GSS0
ACCU-2(N)	1	SEE PLAN	AC-1(N)	4	48	54	HERMETICALLY SEALED SCROLL	54"x13"x37"	257	3/8"	5/8"	208-230V/60/1	31	40	54	12.2	17	ZRUM048GSS0

NOTES:

1. UNIT SHALL HAVE 10 YEAR EXTENDED WARRANTY FOR COMPRESSOR PARTS.
2. PROVIDE LOW AMBIENT CONTROL FOR CONDENSING UNIT OPERATION DOWN TO MINUS 10 DEG.F.
3. PROVIDE COMPRESSOR CYCLE PROTECTOR.
4. PROVIDE STEEL RAILS FOR CONDENSER MOUNTING.
5. STEEL RAILS TO BE PROVIDED BY MECH CONTRACTOR.
6. CONTACT SHALL PROVIDE A LONG LINE SET FOR A REFRIGERANT PIPING IN THE EVENT THAT THE TOTAL REFRIGERANT LEND EXCEEDS THE MANUFACTURER STANDARDS RECOMMENDED LENGTH.
7. AIR CONDITIONER UNIT SHALL PROCESS PRODUCE NOISE LEVELS IN EXCESS OF 42DB FOR SINGLE AIR CIRCULATING DEVICE AND 45 DECIBELS FOR THE CUMULATIVE NOISE LEVEL OF MULTIPLE AIR CIRCULATING DEVICES AS MEASURED THREE FEET FROM THE NOISE SOURCE AT AN OPEN DOOR WINDOW OF THE NEARBY RESIDENCE.

AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR(CFM)
RTU-1(E)	SEE PLAN	2400	480	1920	-
RTU-2(E)	SEE PLAN	2400	600	1800	-
AC-1(N)	SEE PLAN	1430	0	1430	-
AC-2(N)	SEE PLAN	1430	0	1430	-
MAU-1(N)	SEE PLAN	-	1920	-	-
KEF-1(N)	SEE PLAN	-	-	-	2800
EF-1(N)	SEE PLAN	-	-	-	140
TOTAL:		7660	3000	6580	2940
BUILDING PRESSURE:			60	POSITIVE	

NOTES:

1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON OUTSIDE AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.

TYPE I- HOOD SCHEDULE

UNIT ID	MANUFACTURER	LENGTH (FEET-INCH)	MODEL	SERVICE	COOKING TEMPERATURE (DEG F)	EXHAUST TYPE	EXHAUST AIR (CFM)	EXHAUST PLENUM DIA	EXHAUST E.S.P (IN. W.G.)	CONSTRUCTION	WEIGHT (LBS)
HOOD-1 (N)	CAPTIVEAIRE	12'-6"	5424 ND-2-PSP-F	SEE PLAN	600	I	2800	18"	-0.828	430 STAINLESS STEEL	1250

NOTES / ACCESSORIES:

1. PROVIDE MANUFACTURER RECOMMENDED ACCESSORIES & INSTALL AS PER MANUFACTURER'S RECOMMENDATION.

MAKE UP AIR UNIT SCHEDULE

TAG	SERVICE	FLOW RATE	EXTERNAL	SPEED	HEATING CAPACITY		BURNER	FAN DATA						WEIGHT	BASIS OF DESIGN	
			IN W.G.	RPM	INPUT MBH	OUTPUT MBH	%	V/PH/HZ	FLA	MCA (A)	MOCP (A)	HP	BHP	(LBS)	MANUFACTURER	MODEL
MAU-1(N)	SEE PLAN	1920	0.5	1730	74.8	68.8	92	208/1/60	9.6	13.2	20	1.65	1.08	677	CAPTIVEAIRE	A1-D.250-18Z

NOTES:

1. PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR TO PROVIDE MAKE UP AIR UNIT SELECTION EQUIVALENT TO ABOVE SELECTION.

UNHEATED AIR CURTAIN SCHEDULE

UNIT ID	LOCATION	LENGTH (IN.)	SUPPLY FAN		ELECTRICAL		WEIGHT	MANUFACTURER	MODEL	NOTES
			CFM	MOTOR (H.P.)	VOLTS/PH/HZ	AMPS				
ACH-1 (N)	SEE PLAN	72.0	1800	2 1/6	115/1/60	2.6	58	MARS	LPV272-1U*-OB	1,2,3,4,5
ACH-2 (N)	SEE PLAN	36.0	900	1/6	115/1/60	2.4	32	MARS	LPV236-1U*-OB	1,2,3,4,5

NOTES:

1) PROVIDE MANUFACTURER RECOMMENDED ACCESSORIES
2) PROVIDE OVERCURRENT PROTECTION DEVICES AND DISCONNECT SWITCHES.
3) PROVIDE WALL MOUNTED CONTROL PANEL WITH "HAND/OFF/AUTO" SWITCH.
4) COORDINATE MOUNTING TYPE AND FINISH WITH THE ARCHITECT.
5) COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR POWER REQUIREMENTS.

VENTILATION CALCULATION

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER 2024 IMC	NUMBER OF PEOPLE AS PER AS PER 2024 IMC	NUMBER OF PEOPLE AS PER ARCH LAYOUT	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER AS PER 2024 IMC		PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM)/(CFM/SQ.FT)	PROVIDED EXHAUST AIRFLOW
						CFM/PEOPLE	CFM/SQ.FT			
DINING AREA	1610	70	113	0	64	7.5	0.18	770	0	0
RESTROOM-1	55	0	0	0	0	0	0	0	70	75
RESTROOM-2	55	0	0	0	0	0	0	0	70	75
KITCHEN	820	20	17	0	8	7.5	0.12	2150	0.7	2800
BOH 1	279	0	0	0	0	0	0.12	35		
BOH 2	376	0	0	0	0	0	0.12	45		
TOTAL	**3195**		**130**	**0**	**72**			**3000**		**2950**

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ELECTRICAL SYMBOLS LIST

LIGHTING

	LIGHTING FIXTURE(N)
	LIGHTING FIXTURE(N)
	EMERGENCY LIGHT(E)
	EXIT AND EMERGENCY LIGHT WITH BATTERY BACKUP(E)

SWITCHES AND CONTROLS

S^{D}_{a}	WALL BOX DIMMER SWITCH, LUTRON MAESTRO SERIES. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
S_{OS}	WALL OCCUPANCY SENSOR.
S_{OV}	MANUAL OVERRIDE SWITCH

WIRING SYSTEM

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, 1#12 N. & 1#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, #12 N. & #12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	CONDUIT AND WIRE TO BUILDING GROUND.
	EXISTING
	NEW

ELECTRICAL DRAWING LIST

E0.1	ELECTRICAL NOTES, ABBREVIATIONS, SYMBOLS
E0.2	ELECTRICAL SPECIFICATIONS SHEET 1 OF 2
E0.3	ELECTRICAL SPECIFICATIONS SHEET 2 OF 2
E1.1	ELECTRICAL POWER PLAN
E1.2	ELECTRICAL ROOF POWER PLAN
E1.3	ELECTRICAL KITCHEN EQUIPMENT SCHEDULE
E2.1	ELECTRICAL LIGHTING PLAN
E2.2	ELECTRICAL LOW VOLTAGE PLAN
E3.1	ELECTRICAL DETAILS
E5.1	RISER DIAGRAM
E5.2	ELECTRICAL PANEL SCHEDULES

CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:

A. 2024 INTERNATIONAL BUILDING CODE
B. 2024 INTERNATIONAL PLUMBING CODE
C. 2024 INTERNATIONAL MECHANICAL CODE
D. 2024 INTERNATIONAL FUEL GAS CODE
E. 2024 ENERGY CONSERVATION CONSTRUCTION CODE
F. 2024 INTERNATIONAL FIRE CODE
H 2023 NATIONAL ELECTRICAL CODE.

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR/CEILING.
GFI	DUPLEX GFI RECEPTACLE, +18" AFF OR AS NOTED.
	DUPLEX RECEPTACLE, +18" AFF OR AS NOTED.
CL	CEILING MOUNTED RECEPTACLE
	DUPLEX CONVENIENCE RECEPTACLE, CONTROLLED FROM WALL SWITCH. HALF SWITCHED, HALF CONSTANT HOT.
	DOUBLE DUPLEX RECEPTACLE – 20A–1P, 125V, NEMA 5–20R.
H	SPECIAL RECEPTACLE
	DATA OUTLET – (2) 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.

MOTORS AND CONTROLS

M / S_M	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
	NON–FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.
S_M	MANUAL MOTOR SWITCH

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
#	KEYED NOTE REFERENCE
#	EQUIPMENT TAG REFERENCE
1	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

POWER DISTRIBUTION

	EXISTING DISTRIBUTION PANELBOARD, 208Y/120V–SURFACE OR FLUSH MOUNTED.
	NEW DISTRIBUTION PANELBOARD, 208Y/120V–SURFACE OR FLUSH MOUNTED.

ELECTRICAL ABBREVIATIONS

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

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE AND INTERNATIONAL ENERGY CONSERVATION CODE.
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. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
5. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
6. 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, PANELS, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
7. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
8. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
9. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE–EXISTING CONDITIONS OR BETTER.
10. 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.
11. 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.
12. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
13. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
14. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
15. 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.
16. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
17. 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.
18. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
19. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
20. 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.
21. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
22. 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.
23. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
25. 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.
26. 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.

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ELECTRICAL SPECIFICATIONS

1. GENERAL:

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

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN 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: 208Y/120 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

b. DISTRIBUTION: 208Y/120 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 PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR

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

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE 2021 EXISTING INTERNATIONAL 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

*AIC RATING SHALL BE COORDINATED WITH THE UTILITY COMPANY. BASE BID ACCORDINGLY.

8. RACEWAYS:

A. PROVIDE RACEWAYS COMPLETE WITH BOXES, FITTINGS AND ACCESSORIES. CONDUIT OR TUBING SIZES REFERRED TO IN SPECIFICATIONS AND ON DRAWINGS ARE NOMINAL DIAMETERS. MINIMUM DIAMETER SHALL BE 3/4 IN.

B. MATERIALS

1) RACEWAYS:

a. RIGID STEEL CONDUIT: FULL–WEIGHT PIPE, GALVANIZED, THREADED.

b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.

c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.

d. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW–ON.

e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW–ON.

2) FITTINGS AND ACCESSORIES:

a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.

b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.

c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.

3) BOXES:

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

b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW–ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.

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ELECTRICAL SPECIFICATIONS (CONT.)

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

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

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER NEC 386.56 AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

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

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

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

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

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

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

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

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

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

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 NEC TABLE 300.19(A).

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.

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.

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

F. 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.

10. WIRE AND CABLE:

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

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

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

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

E. COLOR CODING SHALL BE AS FOLLOWS:

208Y/120 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.

F. 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.

G. 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.

H. 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.

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

J. 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.

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

D. COLORS: COORDINATE COLORS WITH ARCHITECT.

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

12. 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. 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 TOTAL HARMONIC DISTORTION OF LESS THAN 20% AT ALL INPUT VOLTAGES.

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

E. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924, 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.

13. 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.

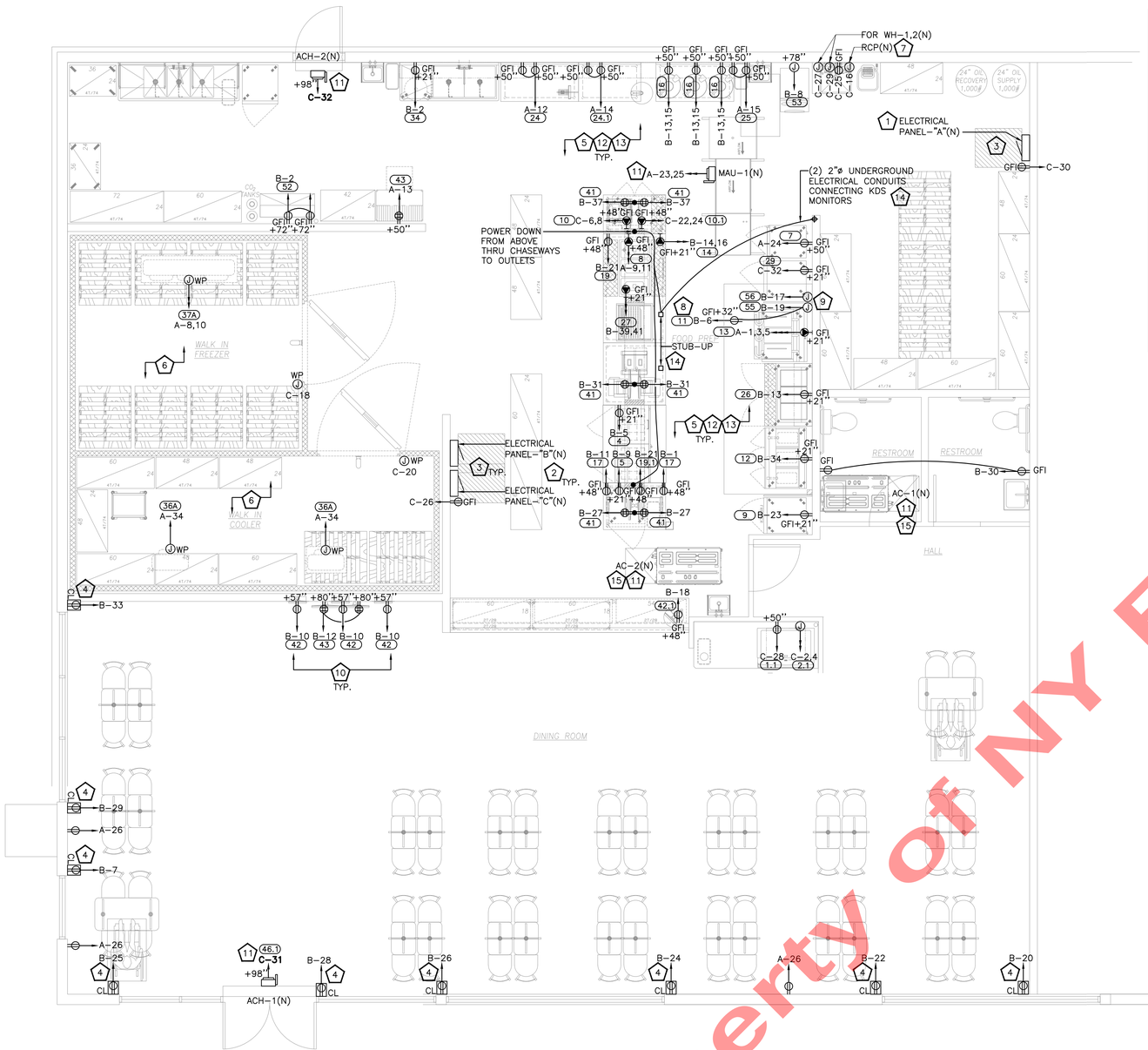
M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN, WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO CASE 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.

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

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KITCHEN EQUIPMENT NOTES:

A. FINAL CONNECTION TO ALL HARD-WIRED EQUIPMENT SHALL BE MADE WITH "SEAL-TIGHT" FLEXIBLE CONDUIT.

B. THE ELECTRICAL CONTRACTOR SHALL MAKE FINAL ELECTRICAL CONNECTIONS TO ALL RELATED EQUIPMENT.

C. THE ELECTRICAL CONTRACTOR SHALL VERIFY ROUGH-IN REQUIREMENTS, LOCATIONS, MOUNTING HEIGHTS, VOLTAGE, PHASE, AMPS, HP, KW, ETC. FOR ALL EQUIPMENT PRIOR TO ROUGH-IN.

D. CONDUITS(RACEWAYS) ENTERING OR LEAVING WALK-IN BOXES: PER NEC 300.7 WHERE PORTIONS OF A RACEWAY OR SLEEVE ARE KNOWN TO BE SUBJECT TO DIFFERENT TEMPERATURES AND WHERE CONDENSATION IS KNOWN TO BE A PROBLEM, E.C. SHALL PROVIDE TEMPERATURE SEAL-OFF'S

E. ALL CIRCUIT BREAKERS PROVIDED WITH SHUNT TRIPPING DEVICES SHALL HAVE THE CONTROL CIRCUIT ROUTED THROUGH DRY CONTACTS PROVIDED IN THE FIRE PROTECTION SYSTEM. UPON ACTIVATION OF FIRE PROTECTION SYSTEM THOSE CIRCUIT BREAKERS SHALL BE AUTOMATICALLY TRIPPED.

F. ALL CIRCUITS SHALL HAVE AN INSULATED GROUND WIRE (BOND) SIZED PER N.E.C. #250.122, #12 MINIMUM GROUND, WIRE NOT SHOWN ON DRAWINGS.

G. THE ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL DISCONNECT SWITCHES, CONDUIT, WIRE AND INSTALL UNDER SUPERVISION OF THE EQUIPMENT SUPPLIER.

H. THE ELECTRICAL CONTRACTOR SHALL VERIFY PLUG CONFIGURATIONS FOR APPLICABLE EQUIPMENT WITH SUPPLIER PRIOR TO ROUGH-IN.

I. REFER TO SHEET E1.3 FOR KITCHEN EQUIPMENT SCHEDULES.

POWER PLAN GENERAL NOTES:

A. REFER TO SHEET E0.1 FOR ELECTRICAL PLAN NOTES & SYMBOL LIST.

B. E.C. SHALL COORDINATE WITH OTHER TRADE CONTRACTORS FOR EXACT LOCATION AND POWER REQUIREMENT OF THE EQUIPMENT FROM OTHER TRADES. PROVIDE WIRING AND CONTROLS AS REQUIRED (IF NOT PROVIDED BY THEM), PRIOR TO BID. BASE BID ACCORDINGLY.

C. ALL THE CIRCUITS SUPPLYING KITCHEN EQUIPMENT AND SHOWN "GFI" ON POWER PLAN SHALL BE PROTECTED EITHER AT A PANEL WITH GFI RATED BREAKER OR RECEPTACLE WITH GFI AS PER NEC 210.8. IF GFI RECEPTACLES ARE USED, CONTRACTOR SHALL LOCATE THE GFI RECEPTACLES SUCH THAT THESE ARE READILY ACCESSIBLE PER CODE.

D. ALL THE RECEPTACLES SHALL BE RATED PER CIRCUIT. E.C. SHALL VERIFY AND MAKE FINAL CONNECTIONS ACCORDINGLY.

E. ELECTRICAL CONTRACTOR SHALL PROVIDE GFCI PROTECTION FOR ALL THE FLOOR OUTLETS AS PER NEC ARTICLE.

F. ELECTRICAL CONTRACTOR SHALL PROVIDE TYPED PANEL DIRECTORY FOR ALL THE ELECTRICAL PANELS AS PER NEC 408.4(A)

G. ALL KITCHEN EQUIPMENT POWER REQUIREMENTS SHALL BE COORDINATED WITH KITCHEN EQUIPMENT VENDOR AND PROVIDE AS REQUIRED. BASE BID ACCORDINGLY.

H. THE CLEAR WORKING SPACE SHALL BE PROVIDED FOR THE METERS, PANEL BOARDS, AND OTHER ELECTRICAL EQUIPMENT AS PER SECTION 110.26 OF NEC.

I. E.C. SHALL FOLLOW GROUNDING/BONDING AS PER NEC ARTICLE 250.

J. A SEPARATE PERMIT SHALL BE SUBMITTED FOR LOW VOLTAGE, SIGNS AND WIRING ALONG WITH TYPE OF WIRES, CONTROL AND TOTAL COST IN COORDINATION WITH OWNER.

K. ALL EXPOSED ELECTRICAL, DATA, PHONE, SECURITY, FIRE, ETC. WIRING, SHALL BE INSTALLED IN A WORK-LIKE MANNER. PARALLEL AND PERPENDICULAR TO THE BUILDING STRUCTURE AND SUPPORTED A MAXIMUM OF EIGHT FEET (8'). COORDINATE WITH LOW VOLTAGE CONTRACTOR FOR MORE INFORMATION.

POWER PLAN KEYED NOTES:

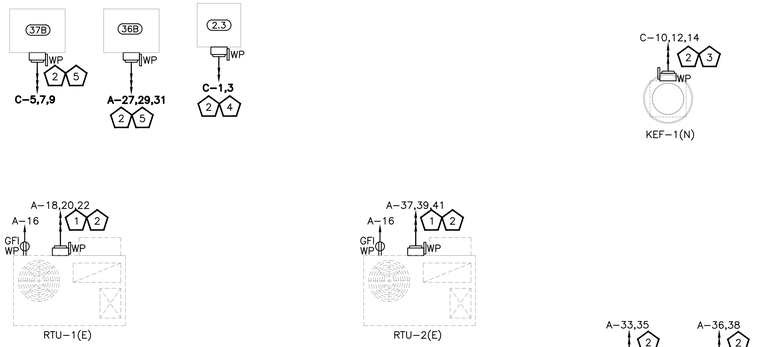
1. NEW 400A, (MCB) 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A". REFER RISER SHEET E-5.1 FOR MORE INFORMATION. E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
2. NEW 125A, MLO, 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANELS "B" AND "C". REFER RISER SHEET E-5.1 FOR MORE INFORMATION. E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
3. E.C. SHALL VERIFY/PERFORM THE INSTALLATION OF ELECTRICAL PANELS IN COMPLIANCE WITH NEC ARTICLE 110.26(A) AND (B). E.C. SHALL FIELD VERIFY THAT THE PANELS ARE UNOBSTRUCTED AND THE AREA WHERE THE PANELS ARE PLACED SHALL NOT BE USED AS A STORAGE SPACE.
4. PROVIDE SHOW WINDOW RECEPTACLE AS PER NEC 210.62. VERIFY EXACT LOCATION WITH ARCHITECT/OWNER.
5. E.C TO COORDINATE WITH KITCHEN EQUIPMENT VENDOR/ MANUFACTURER FOR EXACT POWER REQUIREMENTS. E.C TO COORDINATE WITH ARCHITECT/ OWNER FOR EXACT MOUNTING HEIGHT, LOCATION OF ELECTRICAL OUTLET AND OTHER ACCESSORY REQUIREMENT BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
6. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER/LANDLORD FOR EXACT LOCATION AND MOUNTING HEIGHT OF WALK-IN COOLER/FREEZER ELECTRICAL FIXTURE. PROVIDE NEW ELECTRICAL CONNECTIONS, WIRING, AND FIXTURES AS REQUIRED. VERIFY FIELD CONDITIONS PRIOR TO INSTALLATION. BASE BID ACCORDINGLY.
7. ELECTRICAL SUPPLY PROVISION FOR THE WATER HEATER WH-1,2(N) AND RCP-1(N). E.C. SHALL COORDINATE WITH THE PLUMBING CONTRACTOR FOR THE EXACT POWER REQUIREMENTS PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.
8. E.C. SHALL VERIFY NEW HOOD CONTROLS AND PROVIDE THE INTERLOCK WITH DIGITAL KITCHEN TIMER IN COORDINATION WITH HOOD VENDOR. BASE BID ACCORDINGLY.
9. E.C. SHALL PROVIDE POWER FOR HOOD CONTROLS AND FIRE SUPPRESSION SYSTEM. COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR AND EXACT POWER & CONTROL REQUIREMENTS WITH MANUFACTURERS PRIOR TO ROUGH-IN. PROVIDE CONTROLS AND WIRING AS REQUIRED IN FIELD. BASE BID ACCORDINGLY.
10. E.C. SHALL COORDINATE WITH THE ARCHITECT/OWNER FOR THE EXACT LOCATION AND MOUNTING HEIGHT OF THE ELECTRICAL OUTLETS FOR SELF ORDER KIOSK, DIGITAL MENU BOARDS PROVIDE AS REQUIRED. BASE BID ACCORDINGLY.
11. E.C. TO COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENT OF MECHANICAL EQUIPMENTS WITH MECHANICAL CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER FINAL SELECTION OF MECHANICAL EQUIPMENTS IN FIELD. INFORM ENGINEERS FOR ANY DISCREPANCY FOUND BEFORE COMMENCING ANY WORK.
12. PROVIDE A GFCI RELAY AT LOAD SIDE.
13. E.C. SHALL COORDINATE WITH THE ARCHITECT/OWNER FOR THE EXACT LOCATION AND MOUNTING HEIGHT OF THE ELECTRICAL OUTLETS AND PROVIDE AS REQUIRED BASE BID ACCORDINGLY.
14. PROVIDE (2) 2"Ø UNDERGROUND CONDUIT WITH STUB-UP BETWEEN KDS MONITOR LOCATION AND ADJACENT WALL CONDUIT FOR POWER/DATA CONNECTIONS. COORDINATE EXACT LOCATION AND INSTALLATION REQUIREMENTS WITH OWNER, ARCHITECT, AND EQUIPMENT VENDOR. BASE BID ACCORDINGLY.
15. POWER FOR THE INDOOR UNIT SHALL BE CONNECTED FROM THE OUTDOOR UNIT E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE FEEDER AND CONDUIT ACCORDINGLY.

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

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ROOF POWER PLAN GENERAL NOTES:

A. COORDINATE EXACT LOCATION OF HVAC EQUIPMENTS WITH MECHANICAL CONTRACTOR.

B. ELECTRICAL CONTRACTOR SHALL PROVIDE WEATHER PROOF GFI RECEPTACLE AS PER NEC 210.63.

C. ELECTRICAL CONTRACTOR SHALL LIMIT SEAL TIGHT TO MAXIMUM OF SIX FEET.

D. ELECTRICAL CONTRACTOR SHALL UTILIZE IMC AND RIGID HEAVY METAL CONDUIT FOR EXTERIOR APPLICATIONS OR WHERE EXPOSED TO WEATHER.

E. A 125-VOLT, SINGLE-PHASE, 20-AMPERE-RATED RECEPTACLE OUTLET SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION FOR THE SERVICING OF HVAC EQUIPMENT AS PER NEC SECTION 210.63. THE RECEPTACLE SHALL BE LOCATED ON THE SAME LEVEL AND WITHIN 25 FEET OF THE EQUIPMENT.

(#) ROOF POWER PLAN KEYED NOTES:

1. E.C. SHALL COORDINATE THE DISCONNECT AND FUSE REQUIREMENTS FOR THE EXISTING MECHANICAL UNIT WITH THE MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN. PROVIDE A NEW DISCONNECT IF THE EXISTING DISCONNECT IS NOT AVAILABLE/OPERABLE AT THE SITE. BASE BID ACCORDINGLY.

2. E.C SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES. BASE BID ACCORDINGLY.

3. INTERCONNECT KEF-1(N) WITH MUA-1(N). E.C TO COORDINATE WITH MECHANICAL CONTRACTOR & MECHANICAL DRAWINGS.

4. E.C. SHALL COORDINATE WITH THE ARCHITECT/OWNER AND THE EQUIPMENT MANUFACTURER TO VERIFY THE EXACT LOCATION OF THE ICE REMOTE CONDENSER PRIOR TO ROUGH-IN. INSTALLATION SHALL COMPLY WITH NEC CLEARANCE REQUIREMENTS AND BE INCLUDED IN THE BASE BID ACCORDINGLY.

5. E.C. SHALL COORDINATE WITH THE ARCHITECT/OWNER AND WALK-IN COOLER/FREEZER VENDOR TO VERIFY THE EXACT LOCATION OF THE CONDENSER PRIOR TO ROUGH-IN. INSTALLATION SHALL COMPLY WITH NEC CLEARANCE REQUIREMENTS AND BE INCLUDED IN THE BASE BID ACCORDINGLY.

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(#) KITCHEN EQUIPMENT SCHEDULE

ITEM	QTY	DESCRIPTION	MAKE	MODEL	CONNECTION
1.1	1	SODA DISPENSER-DINING ROOM	CORNELIUS	ENDURO -300	120 1PH 3.5 AMP SR + 50"
2.1	1	ICE MAKER, CUBE STYLE AT DINING ROOM	MANITOWOC	IYT0900A	208-230 1PH 11.7 AMP JB + 78"
2.3	1	ICE MAKER REMOTE CONDENSER	MANITOWOC	JCT1200-261	208-230 1PH 1 AMP (ON ROOF)
4	1	REFRIGERATED PREP TABLE, DUAL SIDED	BEVERAGE AIR	SPE72HC-30M-DS	120 1PH 5.4 AMP SR + 21"
5	1	UNDERCOUNTER REFRIGERATOR	BEVERAGE AIR	UCFD36AHC-2	120 1PH 4.0 AMP SR + 21"
7	1	REACH IN REFRIGERATOR	DUKERS	D28R	120 1PH 3.1 AMP DR + 24"
8	1	VERTICAL CONTACT TOASTER	ANTUNES	VCTM-2-9210913	208 1PH 14.9 AMP SR + 48"
9	1	REACH IN FREEZER	DUKERS	D28F	120 1PH 9.5 AMP SR + 21"
10	1	EGG STATION	ANTUNES	ESDZ-1200 (9300633)	200-240 1PH 15 AMP SR + 48"
10.1	1	EGG STATION	ANTUNES	ESDZ-1200 (9300633)	200-240 1PH 15 AMP SR + 48"
11	1	DIGITAL KITCHEN TIMER	BEAMNOVA	CAL-12C	120 1PH 5 AMP DR + 32"
12	1	GAS FRYER W/ FILTER	HENNY PENNY	EEG243.0	120 1PH 12.8 AMP DR + 21"
13	1	GAS CLAMSHELL GRILL DOUBLE SIDED	TAYLOR	L811	208 3PH 22 AMP SR + 21"
14	1	HOT WELLS WELLS, DROP-IN	HATCO	HWBI-3	208 1PH 17.4 AMP SR + 21"
16	2	RICE COOKER, ELECTRIC	HAMILTON BEACH	37590	240 1PH 10.42 AMP SR + 50"
17	2	ELECTRIC CONTACT GRILL	WARING	WFG150	120 1PH 15 AMP DR + 48"
19	1	S/S WORKTABLE W/ UNDERSHELF & FLAT TOP	JOHN BOOS	ST6-48108SSK	(2) 120 1PH 20 AMP DCO + 48"
19.1	1	S/S WORK TABLE, OPEN BASE	JOHN BOOS	ST6-30485BK	120 1PH 20 AMP DCO + 48"
19.2	2	S/S WORKTABLE W/ UNDERSHELF & FLAT TOP	JOHN BOOS	ST6-2448SBK	120 1PH 20 AMP DCO + 50"
24	1	S/S WORK TABLE W/ UNDERSHELF & BACKSPLASH	JOHN BOOS	ST6R5-3060SSK	(2) 120 1PH 20 AMP DCO + 50"
24.1	1	S/S WORK TABLE W/ UNDERSHELF & BACKSPLASH	JOHN BOOS	ST6R5-3048SSK	(2) 120 1PH 20 AMP DCO + 50"
25	1	S/S WORKTABLE W/ UNDERSHELF	JOHN BOOS	ST6R5-3060SSK	(2) 120 1PH 20 AMP DCO + 50"
26	1	REFRIGERATED BATTER STATION	ATOSA	MSF8306GR	120 1PH 2.3 AMP SR + 21"
27	1	CONVECTION HEATED SERVING STATION, DROP-IN	MERCO	MCD2928NNN	208-230V 1PH 15.9 AMP SR + 21"
29	1	HOT HOLDING CABINET	AVANTCO	HEAT-1836I	120 1PH 13 AMP DR + 21"
33	1	WATER HEATER	BY G.C.		VERIFY W/ ENGINEER
34	1	SALAD DRYER	HOBART	SDPE	120 1PH 2.5 AMP DR + 21"
36	1	WALK IN COOLER	KOLPAK	CUSTOM	120 1PH 6 AMP JB FROM ABOVE
36A	1	COOLER EVAP COIL	KOLPAK	AM76-062-1EC-PR-A	120 1PH 0.8 AMP JB FROM ABOVE
36B	1	COOLER REMOTE CONDENSER UNIT	KOLPAK	PC150AMZOP-3S	208-230V 3PH 10.0 AMP (ON ROOF)
36	1	WALK IN FREEZER	KOLPAK	CUSTOM	120 1PH 6 AMP JB FROM ABOVE
36A	1	FREEZER EVAP COIL	KOLPAK	EL36-148-2EC-PR-A	208-230V 1PH 19.1 AMP JB FROM ABOVE
36B	1	FREEZER REMOTE CONDENSER UNIT	KOLPAK	PC500ALZOP-3S	208-230V 3PH 20.9 AMP (ON ROOF)
41	7	KDS MONITOR	BY OWNER		120 1PH 5 AMP DR + 32"
42	3	SELF ORDER KIOSK W/ RECESSED AV BOX	BY OWNER		120 1PH 5 AMP QUAD DR + 57"
42.1	1	SELF ORDER KIOSK ON LAZY SUSAN	BY OWNER		120 1PH 5 AMP DR + 21"
43	2	DIGITAL MENUBOARD	BY OWNER		120 1PH QUAD BOX 4 AMP + 80"
46.1	1	AIR CURTAIN (UNHEATED)	BERNER	SLC07-1042A	120 1PH 3.4 AMP JB + 98"
52	1	BAG N' BOX RACK & CARBONATOR	BY VENDOR		(2) 120 1PH 7.2 AMP DR + 72"
53	1	ICE MAKER, CUBE STYLE	MANITOWOC	IYT0620A	120 1PH 12.2 AMP JB + 78"
55	1	EXHAUST HOOD TYPE -1 (EXISTING)	CAPTIVE AIRE	5424-ND-2-PSP-F	120 1PH 5 AMP JB ABOVE CEILING
56	1	FIRE SUPPRESSION SYSTEM	CAPTIVE AIRE	TANK SYSTEM	120 1PH 3 AMP JB ABOVE CEILING
65	1	MANAGER WORKSTATION	BY OWNER		120 1PH QUAD BOX + 48"

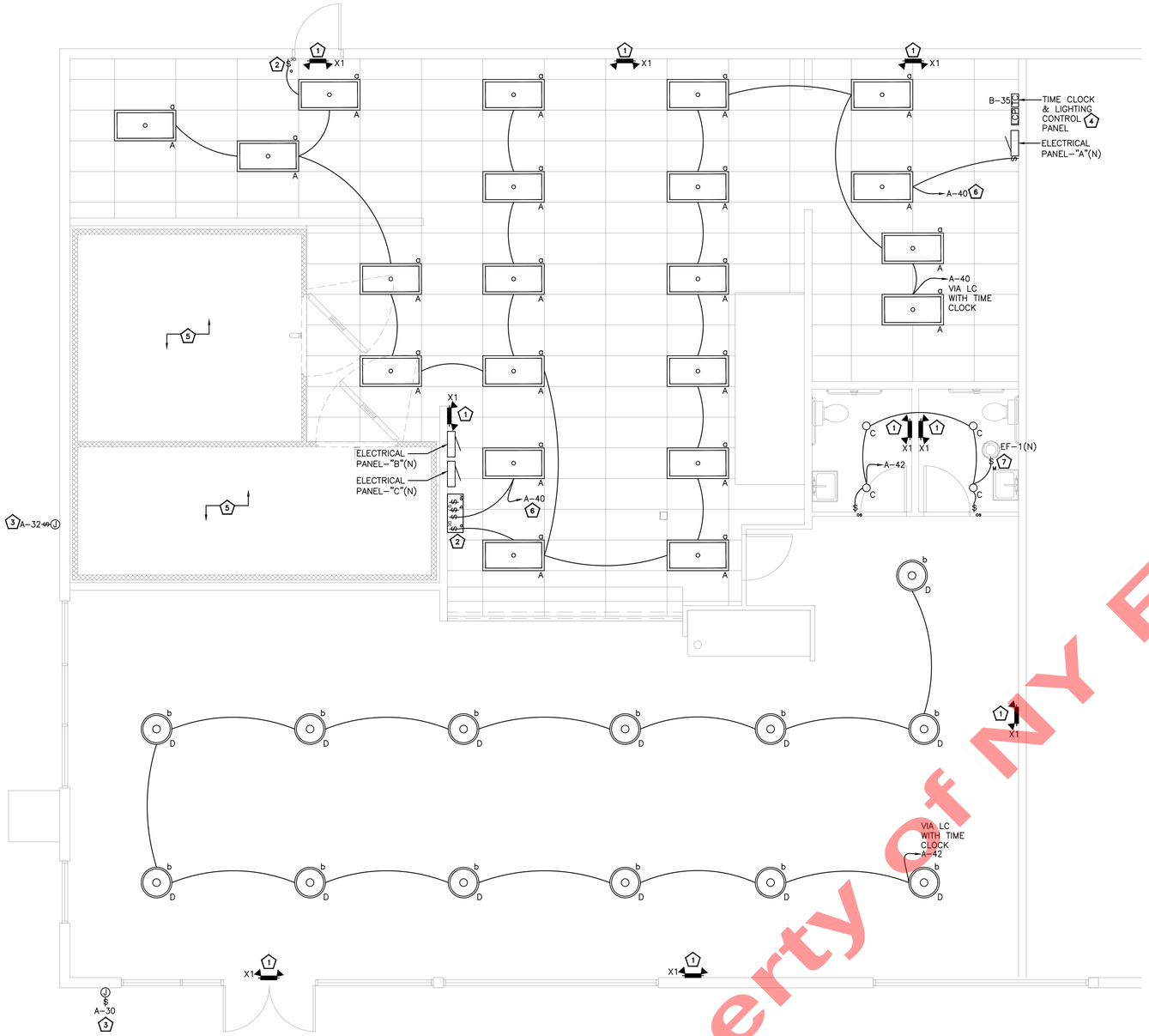
1 ELECTRICAL KITCHEN EQUIPMENT SCHEDULE
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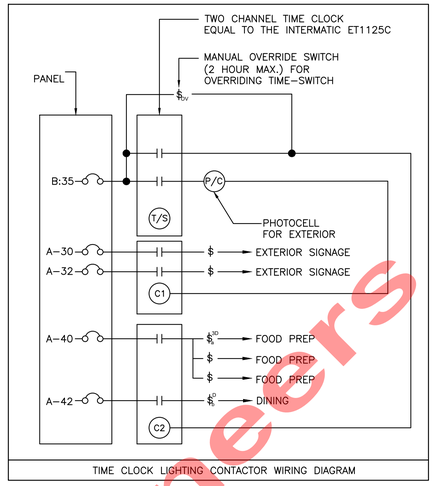
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1 ELECTRICAL LIGHTING PLAN
1/4" = 1'–0"



TIME CLOCK LIGHTING CONTACTOR WIRING DIAGRAM

ELECTRICAL LIGHTING PLAN GENERAL NOTES:

A. VERIFY ALL LUMINARIE COLORS, TRIMS, LENGTHS, ETC. WITH THE ARCHITECT PRIOR TO PLACING FINAL PURCHASE ORDERS. SUBMISSION PF SHOP DRAWINGS WILL BE INTERPRETED AS HAVING BEEN COORDINATED WITH THE ARCHITECTURAL DRAWINGS.

B. PROVIDE ALL LENGTHS, FEEDS, ACCESSORIES, CONNECTORS, WIRING, POWER SUPPLIES, DRIVERS ETC. FOR A COMPLETE INSTALLATION. THE E.C. SHALL VERIFY THE COMPLETE BILL OF MATERIAL WITH MANUFACTURER'S REPRESENTATIVE AND ENSURE ALL EQUIPMENT ARE INCLUDED IN BID PRICE. COORDINATE INSTALLATION WITH ARCHITECTURAL DETAILS.

C. VERIFY FINAL LUMINARIE LOCATIONS WITH OTHER CEILING MOUNTED EQUIPMENTS SUCH AS DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLANS.

D. VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF ALL WALL MOUNTED LUMINAIRE WITH ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO ROUGH–IN.

E. E.C. TO COORDINATE EXACT LOCATION WITH ARCHITECT FOR LIGHTING DETAILS.

F. E.C. SHALL VERIFY AND RE–USE THE EXISTING LIGHTING CONTROLS. REPLACE NEW WITH SAME TYPE, IF EXISTING IS IN–OPERABLE. BASE BID ACCORDINGLY.

G. EXISTING EMERGENCY/EXIT LIGHT FIXTURE SHALL REMAIN. E.C SHALL FIELD VERIFY THE OPERABLE CONDITION OF THE EMERGENCY/EXIT LIGHT FIXTURE AND SHALL BE CONNECTED AHEAD OF ALL SWITCHES PER IECC 2021. BASE BID ACCORDINGLY.

ELECTRICAL LIGHTING PLAN KEYED NOTES:

1. CONNECT ALL EGRESS/EMERGENCY LIGHTING AND NIGHT LIGHT FIXTURES TO THE NEAREST LIGHTING BRANCH CIRCUIT, AHEAD OF ALL SWITCHING AND CONTROLS, IN ACCORDANCE WITH APPLICABLE STATE AND LOCAL CODES. PROVIDE ALL REQUIRED EXIT SIGNS, EMERGENCY LIGHT FIXTURES FOR THE NEW TENANT SPACE AS REQUIRED BY THE LOCAL AHJ. BASE BID ACCORDINGLY.

2. E.C. SHALL COORDINATE THE EXACT LOCATION OF ALL SWITCHES AND SWITCH BANK WITH ARCHITECT/OWNER. CONNECT ALL THE SWITCHES TO THE LIGHTING CONTACTOR WITH TIMER.

3. PROVIDE POWER TO WEATHER PROOF JUNCTION BOX AND TOGGLE SWITCH FOR TENANT SIGNAGE/EXTERIOR LIGHTING VIA LIGHTING CONTACTOR WITH TIMECLOCK/PHOTOCELL. COORDINATE EXACT MOUNTING LOCATION WITH SIGN VENDOR PRIOR TO ROUGH–IN. BASE BID ACCORDINGLY.

4. E.C. SHALL COORDINATE THE EXACT LOCATION OF THE LIGHTING CONTACTOR (L.C.), TIME CLOCK, AND PHOTOCELL WITH THE ARCHITECT/OWNER. COORDINATE THE LIGHTING CONTROL REQUIREMENTS WITH THE LIGHTING CONTROL VENDOR AND PROVIDE NEW LIGHTING CONTACTORS, TIME CLOCKS, PHOTOCELLS, AND ALL REQUIRED AUTOMATIC LIGHTING CONTROLS. BASE BID ACCORDINGLY.

5. E.C. COORDINATE WITH THE WALK–IN COOLER/ FREEZER VENDOR FOR THE LIGHTING FIXTURES, SWITCHES, AND ELECTRICAL CONNECTION REQUIREMENTS. PROVIDE JUNCTION BOX, CIRCUIT, AND SWITCH FOR WALK–IN BOX AS REQUIRED. BASE BID ACCORDINGLY.

6. LIGHT FIXTURE NEAR ELECTRICAL PANEL SHALL NOT BE CONTROLLED BY AUTOMATIC MEANS ONLY AS PER NEC 110.26(D).

7. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR AND PROVIDE POWER CONNECTIONS FOR NEW EXHAUST FANS. E.C. SHALL INTERLOCK EXHAUST FAN EF–1(N) WITH LIGHTING. BASE BID ACCORDINGLY.

LIGHTING FIXTURE SCHEDULE

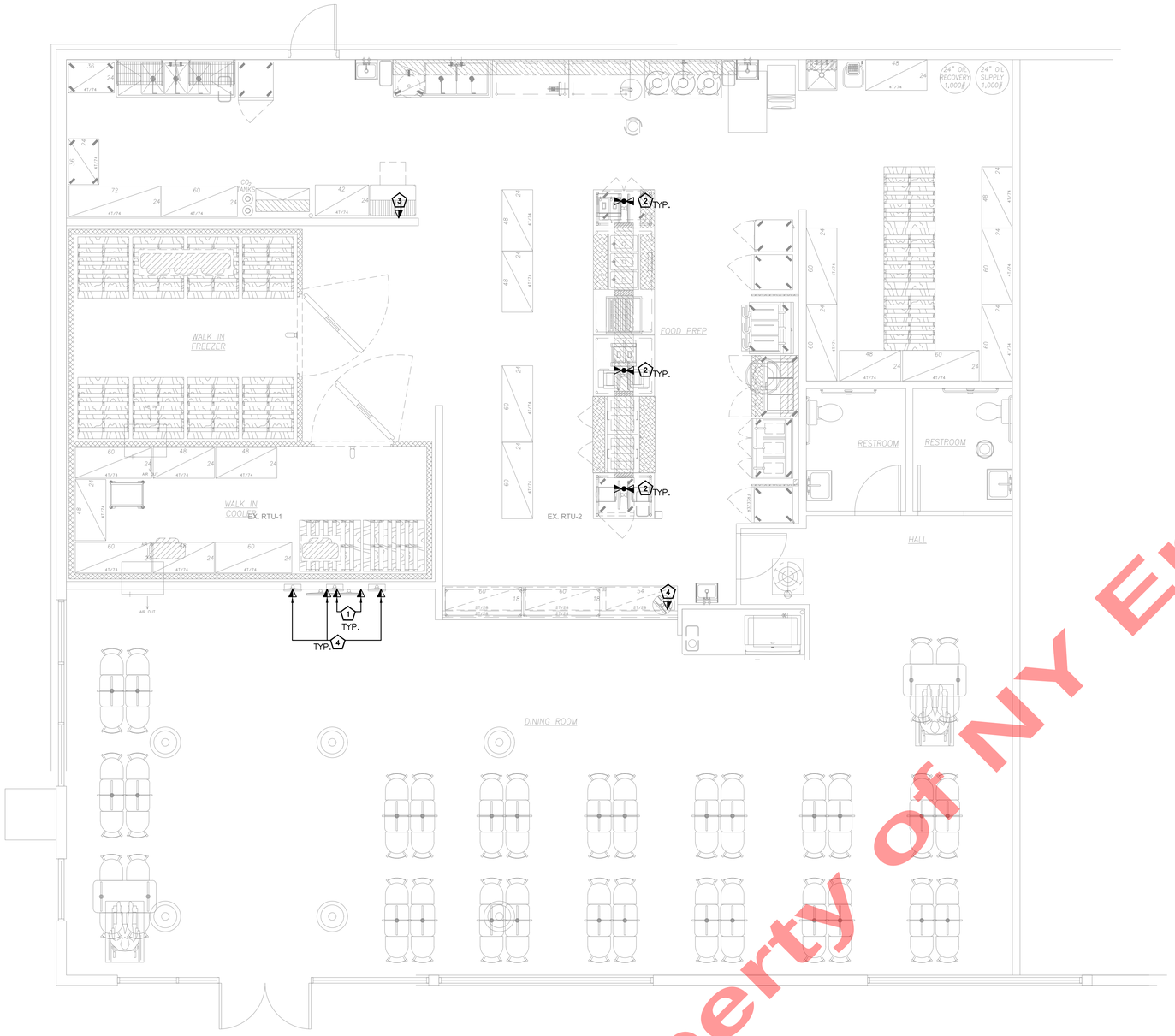
SR.NO	SYMBOL	DESCRIPTION	MANUFACTURER	CATALOGUE NUMBER	WATTS
1	A	2'X4' TROFFER	RLA/QUALITY LIGHTING	RLA–C–4–5–3/BO63964	38.4W
2	C	8"DIAMETER RECESSED LED DOWNLIGHT	RLA/QUALITY LIGHTING	CDR8–ALH–9ACK–10V5 –WH–UNV	52W
3	D	PENDANT MOUNTED FIXTURE	TBD	TBD	34W
4	X1	EXIT SIGN	TBD	TBD	2.2W

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SHEET:
E2.1



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

ELECTRICAL LOW VOLTAGE PLAN GENERAL NOTES:

1. A SEPARATE PERMIT SHALL BE SUBMITTED FOR LOW VOLTAGE, SIGNS AND WIRING ALONG WITH TYPE OF WIRES, CONTROL AND TOTAL COST IN COORDINATION WITH OWNER.
2. ALL EXPOSED ELECTRICAL, DATA WIRING SHALL BE INSTALLED IN A WORK-LIKE MANNER, PARALLEL AND PERPENDICULAR TO THE BUILDING STRUCTURE AND SUPPORTED A MAXIMUM OF EIGHT FEET (8'). COORDINATE WITH LOW VOLTAGE CONTRACTOR FOR MORE INFORMATION.
3. E.C. SHALL COORDINATE WITH THE LOW VOLTAGE CONTRACTOR TO CONFIRM THE EXACT LOCATIONS, MOUNTING HEIGHTS, AND DEVICE TYPES PRIOR TO ROUGH-IN.
4. PLAN IS SHOWN FOR INFORMATION ONLY. COORDINATE WITH OWNER/ARCHITECT, LOW VOLTAGE CONTRACTOR FOR EXACT QUANTITY, LOCATIONS, CABLE TYPES & PROVIDE AS PER REQUIREMENTS.

(#) ELECTRICAL LOW VOLTAGE PLAN KEYED WORK NOTES:

1. E.C. TO PROVIDE AND INSTALL 120V DUPLEX RECEPTACLE AND DATA BOX FOR MENU BOARDS. COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS WITH OWNER/ARCHITECT IN FIELD PRIOR TO COMMENCEMENT OF WORK.
2. KDS MONITOR & DATA: E.C. SHALL PROVIDE J-BOX WITH 120V DUPLEX RECEPTACLE AND TELEPHONE/DATA BOX UNDER COUNTER AT EACH KDS MONITOR LOCATION. COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS WITH OWNER/ARCHITECT IN FIELD PRIOR TO COMMENCEMENT OF WORK.
3. OFFICE POWER & DATA: E.C. SHALL PROVIDE 120V DUPLEX RECEPTACLE AND DATA BOX AS REQUIRED IN OFFICE SPACE. COORDINATE EXACT LOCATIONS AND MOUNTING HEIGHTS WITH OWNER/ARCHITECT IN FIELD PRIOR TO COMMENCEMENT OF WORK.
4. E.C. TO PROVIDE AND INSTALL JUNCTION BOX WITH 120V DUPLEX RECEPTACLE & DATA BOX FOR ORDER KIOSK. COORDINATE LOCATION AND REQUIREMENT PRIOR TO INSTALLATION.

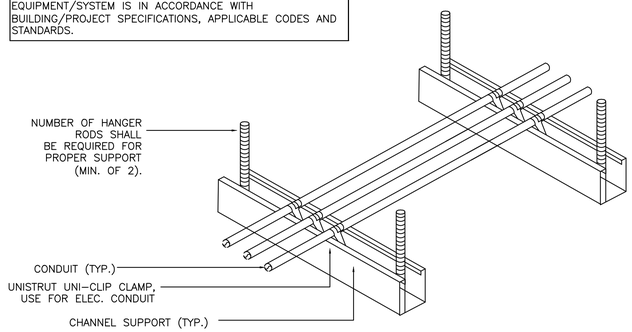
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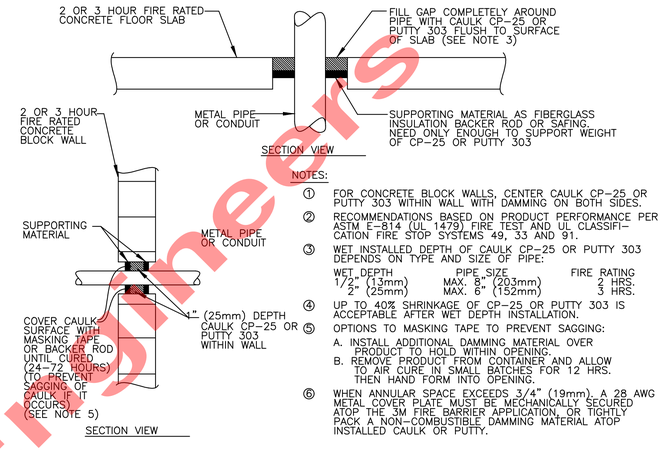
NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT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

1 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.

2 FIRE STOP DETAIL
N.T.S

MANUAL MODE OPERATION:

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

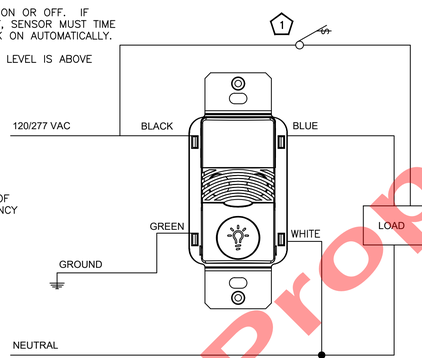
AUTOMATIC MODE OPERATION:

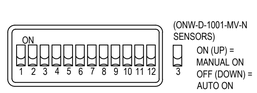
1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. PUSHBUTTON CAN BE USED TO TURN LOAD ON OR OFF. IF PUSHBUTTON IS USED TO TURN LOAD OFF, SENSOR MUST TIME OUT FIRST, BEFORE LOAD CAN TURN BACK ON AUTOMATICALLY.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

SENSOR TYPES INCLUDE:

ONW-D-1001-MV-N

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





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

3 OCCUPANCY/VACANCY-SINGLE LEVEL WIRING DIAGRAM -LOW VOLTAGE WALL SWITCH SENSOR(NEUTRAL CONNECTION)
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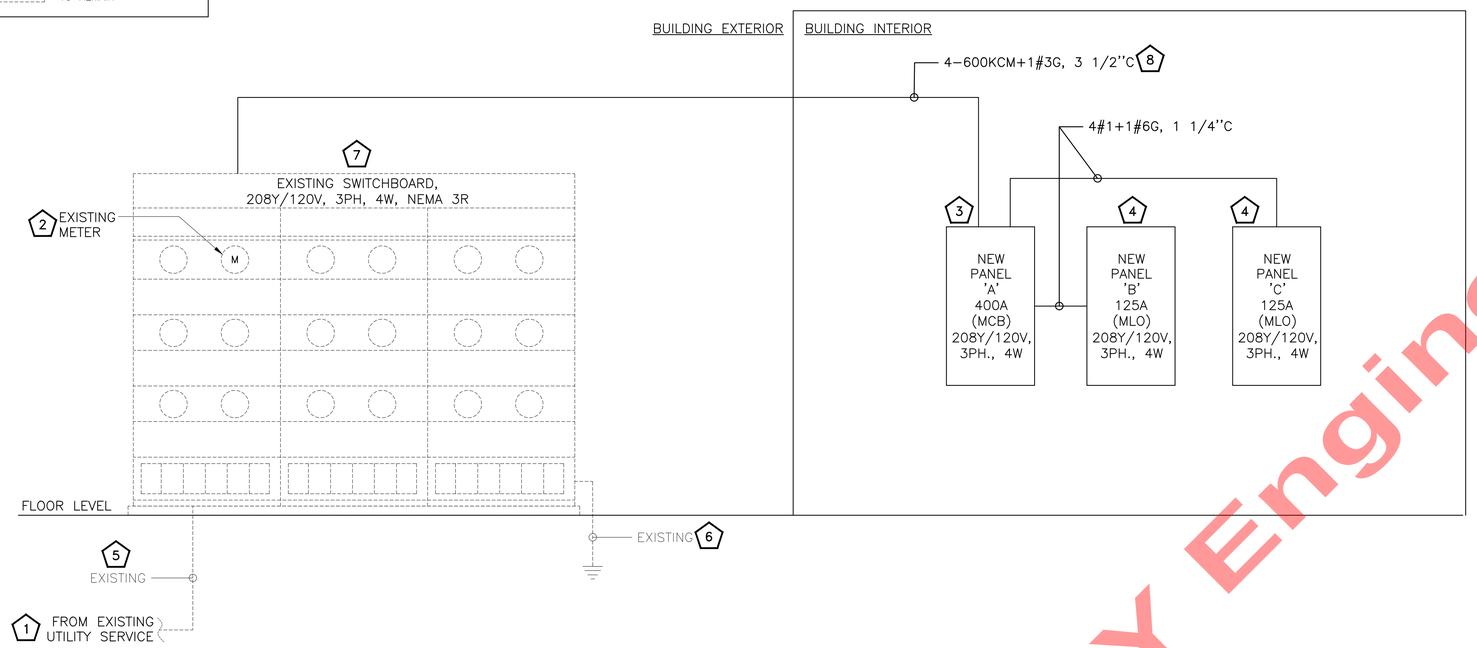
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ELECTRICAL RISER SYMBOL

NEW

EXISTING ITEM/FEEDER TO REMAIN



1 ELECTRICAL RISER DIAGRAM
N.T.S

ELECTRICAL RISER GENERAL NOTES:

A. ALL NEW ELECTRICAL GEAR TO MATCH EXISTING MANUFACTURER EQUIPMENT U.N.O.

B. INFORMATION DEPICTED ON RISER DIAGRAM AND PANEL SCHEDULES IS BASED ON DATA THAT WAS AVAILABLE TO ENGINEER AT TIME OF DESIGN. ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO BID AND REPORT ANY DISCREPANCIES THAT MIGHT LEAD TO DEVIATION FROM THE DESIGN INTENT TO THE ENGINEER.

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

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

E. E.C SHALL COORDINATE WITH OWNER/LANDLORD/BASE BUILDING FOR THE EXACT DETAILS/LIABILITIES.

F. CONDUIT RUN – PER NEC 350.24 THERE SHALL NOT BE MORE THAN THE EQUIVALENT OF FOUR QUARTER BENDS (360 DEGREES TOTAL) BETWEEN PULL POINTS. PROVIDE PULLBOX AS NEEDED.

ELECTRICAL RISER KEY NOTES:

1. EXISTING 208Y/120V, 3–PHASE, 4–WIRE ELECTRICAL SERVICE FOR PROJECT SPACE. E.C. SHALL COORDINATE WITH THE LANDLORD/OWNER AND UTILITY COMPANY TO VERIFY THE EXACT LOCATION IN THE FIELD. THE E.C. SHALL REPORT ANY DISCREPANCY FOUND AT THE SITE TO THE ENGINEER. BASE BID ACCORDINGLY.
2. E.C. SHALL LOCATE AND VERIFY THE EXISTING 208Y/120V, 3–PHASE, 4–WIRE ELECTRICAL METER AND MAIN BREAKER SERVING THE PROJECT SPACE IN COORDINATION WITH THE LANDLORD, OWNER, AND UTILITY COMPANY. THE METER LOCATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY PRIOR TO REUSE, E.C. SHALL VERIFY THE EXISTING METER LOCATION, METER RATING, AND MAIN BREAKER RATING IN THE FIELD. IF THE EXISTING EQUIPMENT IS FOUND TO BE INSUFFICIENT, INOPERABLE, OR DOES NOT MATCH THE DESIGN REQUIREMENTS, E.C. SHALL IMMEDIATELY NOTIFY THE ENGINEER OF RECORD. BASE BID ACCORDINGLY.
3. EXISTING 400A, (MCB) 208Y/120V, 3–PHASE, 4–WIRE ELECTRICAL PANEL "A". E.C. TO FIELD VERIFY EXACT SIZE, LOCATION & OPERABLE CONDITION OF THE PANEL. REPLACE WITH NEW IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
4. NEW 125A, (MLO) 208Y/120V, 3–PHASE, 4–WIRE ELECTRICAL PANEL "B AND C" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE THE EXACT LOCATION OF ELECTRICAL PANEL WITH LANDLORD/OWNER IN FIELD.
5. EXISTING FEEDER TO REMAIN. E.C. TO VERIFY THE OPERABLE CONDITION OF EXISTING FEEDER IN FIELD AND REPLACE WITH NEW IF FOUND INOPERABLE. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCIES. BASE BID ACCORDINGLY.
6. E.C SHALL VERIFY EXISTING GROUNDING CABLE WORKING CONDITION IN COORDINATION WITH OWNER/LANDLORD & REPORT TO ENGINEER IN CASE OF ANY DISCREPANCIES.
7. E.C SHALL VERIFY THE LOCATION AND CONDITION OF THE EXISTING 208Y/120V, 3–PHASE, 4–WIRE ELECTRICAL SWITCHBOARD, SERVING THE PROJECT SPACE IN COORDINATION WITH THE LANDLORD, OWNER, AND UTILITY COMPANY. E.C SHALL REPORT TO THE ENGINEER IF ANY DISCREPANCIES FOUND AT SITE. BASE BID ACCORDINGLY.
8. E.C. SHALL VERIFY IN THE FIELD THAT AN OPERABLE EXISTING FEEDER IS AVAILABLE FOR THE PROJECT SPACE. IF THE EXISTING FEEDER IS FOUND TO BE INSUFFICIENT OR INOPERABLE, REPLACE IT WITH A NEW FEEDER AS SHOWN ON THE RISER DIAGRAM. NOTIFY THE ENGINEER OF RECORD OF ANY DISCREPANCIES. BASE BID ACCORDINGLY.

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PANEL:	A (NEW)											MOUNTING:	SURFACE	
208Y/120	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	BOH	
MAIN CB:	400A	MLO:	NA	BUS:	EXISTING	MIN,						FED FROM:	EXISTING	
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL),E:KITCHEN/EQUIPMENTS														
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						14.94				12.30	O			2
3	30/3P	EQ.13 - GAS CLAMSHELL GRILL	E	2.64	3#10, #10G, 3/4"C		14.94		REFER TO RISER	12.30	O	TO PANEL - B (N)	125/3P	4
5			E	2.64				14.94		12.30	O			6
7	*	SHUNT TRIP				2.0			2#12, #12G, 3/4"C	1.99	H			8
9	20/2P	EQ.8 - VERTICAL CONTACT TOASTER	E	1.55	2#12, #12G, 3/4"C		3.5			1.99	H	WALK-IN FREEZER - EVAPORATOR COIL	$$20/2P	10
11			E	1.55				1.9	2#12, #12G, 3/4"C	0.36	R	EQ.24- SHELF RECEPATCLE	20	12
13	20	EQ.6S -MANAGER DESK	R	0.36	2#12, #12G, 3/4"C	0.7			2#12, #12G, 3/4"C	0.36	R	EQ.24.1- SHELF RECEPATCLE	20	14
15	20	EQ.2S- SHELF RECEPATCLE	R	0.36	2#12, #12G, 3/4"C		0.7		2#12, #12G, 3/4"C	0.36	R	ROOF GFI RECEP.	20	16
17			O	11.71				15.9		4.20	H			18
19	125/3P	TO PANEL - C (N)	O	11.71	REFER TO RISER	15.9			3#8, #10G, 3/4"C	4.20	H	RTU-1 (E)	50/3P	20
21			O	11.71			15.9			4.20	H			22
23	20/2P	MAU-1 (N)	H	1.37	2#12, #12G, 3/4"C			1.7	2#12, #12G, 3/4"C	0.37	E	EQ.7- REACH IN REFRIGERATOR	20	24
25			H	1.37		1.9			2#12, #12G, 3/4"C	0.54	L	DINING RECEPTACLE	20	26
27			E	1.27			1.3					SPARE	20	28
29	20/3P	EQ.36B - WALK-IN COOLER - CONDENSER UNIT	E	1.27	3#12, #12G, 3/4"C			2.5	2#12, #12G, 3/4"C	1.20	L	SIGNAGE	20	30
31			E	1.27		2.5			2#12, #12G, 3/4"C	1.20	L	SIGNAGE	20	32
33	40/2P	ACCU-1 (N)	H	3.22	2#8, #10G, 3/4"C		3.3		2#12, #12G, 3/4"C	0.10	H	WALK-IN COOLER - EVAPORATOR	20	34
35			H	3.22				6.4	2#8, #10G, 3/4"C	3.22	H	ACCU-1 (N)	40/2P	36
37	40/3P	RTU-2 (E)	H	3.48	3#8, #10G, 3/4"C	6.7				3.22	H			38
39			H	3.48			4.7		2#12, #12G, 3/4"C	1.20	L	INTERNAL LIGHTING	20	40
41			H	3.48				4.7	2#12, #12G, 3/4"C	1.20	L	INTERNAL LIGHTING	20	42
				TOTAL CONNECTED LOAD (KVA)		44.64	44.37	48.10						

PANEL:	B (NEW)											MOUNTING:	SURFACE	
208Y/120	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	BOH	
MAIN CB:		MLO:	125A	BUS:		MIN,						FED FROM:	PANEL - A	
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL),E:KITCHEN/EQUIPMENTS														
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	EQ.17 - ELECTRIC CONTACT GRILL	E	1.80	2#12, #12G, 3/4"C	2.10			2#12, #12G, 3/4"C	0.30	E	EQ.34 - SALAD DRYER	20	2
3	20	SPARE					0.9		2#12, #12G, 3/4"C	0.86	E	EQ.52 - BAG N' BOX RACK & CARBONATOR	20	4
5	20	EQ.4 - REFRIGERATED PREP TABLE	E	0.65	2#12, #12G, 3/4"C			1.25	2#12, #12G, 3/4"C	0.60	E	EQ.11 - DIGITAL KITCHEN TIMER	20	6
7	20	SHOW WINDOW	L	0.90	2#12, #12G, 3/4"C	2.4			2#12, #12G, 3/4"C	1.46	E	EQ.53 - ICE MAKER STYLE	$$20	8
9	20	EQ.5 - UNDERCOUNTER REFRIGERATOR	E	0.48	2#12, #12G, 3/4"C		1.0		2#12, #12G, 3/4"C	0.54	R	EQ.42 - SELF ORDER KIOSK	20	10
11	20	EQ.17 - ELECTRIC CONTACT GRILL	E	1.80	2#12, #12G, 3/4"C			2.5	2#12, #12G, 3/4"C	0.72	R	EQ.43 - DIGITAL MENU BOARD	20	12
13	20	EQ.26 - REFRIGERATED BATTER STATION	E	0.28	2#12, #12G, 3/4"C	2.1			2#12, #12G, 3/4"C	1.81	E	EQ.14 - HOT WELLS WELLS	20/2P	14
15	*	SHUNT TRIP					1.8			1.81	E			16
17	#20	EQ.56-FIRE SUPPRESSION SYSTEM	O	0.36	2#12, #12G, 3/4"C			1.0	2#12, #12G, 3/4"C	0.60	R	EQ.42.1 - SELF ORDER KIOSK	20	18
19	20	EQ.5S - EXHAUST HOOD (EXISTING)	E	0.60	2#12, #12G, 3/4"C	1.6			2#12, #12G, 3/4"C	1.00	L	SHOW WINDOW	20	20
21	20	EQ.19.1 - WORK TABLE CONV. RECEP	E	0.36	2#12, #12G, 3/4"C		1.4		2#12, #12G, 3/4"C	1.00	L	SHOW WINDOW	20	22
23	20	EQ.9 - REACH IN FREEZER	E	1.14	2#12, #12G, 3/4"C			2.5	2#12, #12G, 3/4"C	1.40	L	SHOW WINDOW	20	24
25	20	SHOW WINDOW	L	1.40	2#12, #12G, 3/4"C	2.8			2#12, #12G, 3/4"C	1.40	L	SHOW WINDOW	20	26
27	20	EQ.41 - KDS MONITOR	E	1.20	2#12, #12G, 3/4"C		2.8		2#12, #12G, 3/4"C	1.60	L	SHOW WINDOW	20	28
29	20	SHOW WINDOW	L	1.40	2#12, #12G, 3/4"C			1.8	2#12, #12G, 3/4"C	0.36	R	RESTROOM RECEP.	20	30
31	20	EQ.41 - KDS MONITOR	E	1.20	2#12, #12G, 3/4"C	1.2						SPARE	20	32
33	20	SHOW WINDOW	L	1.40	2#12, #12G, 3/4"C		2.9		2#12, #12G, 3/4"C	1.46	R	EQ.12 - GAS FRYER	20	34
35	20	TIMECLOCK	R	0.50	2#12, #12G, 3/4"C			0.5				SHUNT TRIP	*	36
37	20	EQ.41 - KDS MONITOR	E	1.20	2#12, #12G, 3/4"C	1.2						SPARE	20	38
39	20/2P	EQ.27 - CONVECTION HEATED SERVING STATION	E	1.65	2#12, #12G, 3/4"C		1.7					SPARE	20	40
41			E	1.65				1.7				SPARE	20	42
				TOTAL CONNECTED LOAD (KVA)		13.35	12.37	11.18						

PANEL:	C (NEW)											MOUNTING:	SURFACE	
208Y/120	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	BOH	
MAIN CB:		MLO:	125A	BUS:		MIN,						FED FROM:	PANEL - A	
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL),E:KITCHEN/EQUIPMENTS														
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	20/2P	EQ.2.3 - ICE REMOTE CONDENSER	E	0.10	2#12, #12G, 3/4"C	1.32			2#12, #12G, 3/4"C	1.22	E	EQ.2.1 - ICE MAKER, CUBE STYLE AT DINING	$$15/2P	2
3			E	0.10			1.32			1.22	E			4
5	40/3P	EQ.37B - WALK-IN FREEZER - CONDENSER UNIT	E	2.51	3#8, #10G, 3/4"C			4.07	2#12, #12G, 3/4"C	1.56	E	EQ.10 - EGG STATION	20/2P	6
7			E	2.51		4.07				1.56	E			8
9			E	2.51			4.83			2.33	H	KEF-1 (N)	20/3P	10
11	20	SPARE						2.33	3#12, #12G, 3/4"C	2.33	H			12
13	20/2P	EQ.16 - RICE COOKER	E	1.08	2#12, #12G, 3/4"C	3.41				2.33	H			14
15			E	1.08			1.28		2#12, #12G, 3/4"C	0.20	R	RCP	20	16
17	20/2P	EQ.16 - RICE COOKER	E	1.08	2#12, #12G, 3/4"C			1.80	2#12, #12G, 3/4"C	0.72	O	WALK-IN FREEZER LIGHTS & DOOR HEATER	20	18
19			E	1.08		1.80			2#12, #12G, 3/4"C	0.72	O	WALK-IN COOLER LIGHTS & DOOR HEATER	20	20
21	20/2P	EQ.16 - RICE COOKER	E	1.08	2#12, #12G, 3/4"C		2.64		2#12, #12G, 3/4"C	1.56	E	EQ.10.1 - EGG STATION	20/2P	22
23			E	1.08				2.64		1.56	E			24
25	20	GENERAL RECEP.	R	0.18	2#12, #12G, 3/4"C	0.36			2#12, #12G, 3/4"C	0.18	R	SERVICE RECEP.	20	26
27	20	WATER HEATER - 1 (N)	O	0.24	2#12, #12G, 3/4"C		0.66		2#12, #12G, 3/4"C	0.42	E	EQ.1.1 - SODA DISPENSER AT DINING ROOM	15	28
29	20	WATER HEATER - 2 (N)	O	0.24	2#12, #12G, 3/4"C			0.42	2#12, #12G, 3/4"C	0.18	R	SERVICE RECEP.	20	30
31	20	AIR CURTAIN-1 (N)	H	0.31	2#12, #12G, 3/4"C	1.87			2#12, #12G, 3/4"C	1.56	E	EQ.29 - HOT HOLDING CABINET	15	32
33	20	AIR CURTAIN-2 (N)	H	0.29	2#12, #12G, 3/4"C		0.29					SPARE	20	34
35	20	SPARE						0.00				SPARE	20	36
37	20	SPARE				0.00						SPARE	20	38
39	20	SPARE					0.00					SPACE		40
41	20	SPARE						0.00				SPACE		42
				TOTAL CONNECTED LOAD (KVA)		12.83	11.03	11.26						

ELECTRICAL LOAD SUMMARY

PROJECT NAME & ADDRESS: ANGIES MARICOPA, AZ

VOLTAGE: 208Y/120, 3-PHASE, 4W

SR. NO.	LOAD TYPE	CONNECTED LOAD (KVA)		DEMAND FACTOR	DEMAND LOAD (KVA)
1	LIGHTING	5.34	X	1.25	6.68
2	RECEPTACLE <= 10 KVA	10.00	X	1.00	10.00
3	RECEPTACLE >= 10 KVA	-1.56	X	0.50	-0.78
4	KITCHEN EQUIPMENTS	42.88	X	0.65	27.87
5	MOTOR	-3.42	X	1.00	-3.42
6	LARGEST MOTOR	3.42	X	1.25	4.28
7	HVAC LOAD	49.28	X	1.00	49.28
8	OTHER/MISCELLANEOUS (IGNITION FOR GAS WATER HEATER, HAND DRYER, WALK IN COOLER FREEZER HEATER)	9.04	X	1.00	9.04
	TOTAL LOAD (KVA)	**114.99**			**102.95**

TOTAL CONNECTED LOAD :	**114.99**	KVA
TOTAL CONNECTED CURRENT:	**319.19**	AMP
TOTAL DEMAND LOAD:	**102.95**	KVA
TOTAL DEMAND CURRENT:	**285.77**	AMP

ELECTRICAL SERVICE (3-PHASE) = 400 AMPS @ 208Y/120, 3-PHASE, 4-WIRE

PANEL SCHEDULE GENERAL NOTES:

A. VERIFY THE BREAKER RATING, CABLE SIZE AND QUANTITY OF THE EQUIPMENT. BASE BID ACCORDINGLY.

B. ELECTRICAL CONTRACTOR SHALL PROVIDE TYPED PANEL DIRECTORY FOR ALL THE ELECTRICAL PANELS AS PER NEC 408.4(A).

C. **"*"** IN PANEL SCHEDULES INDICATES NEW BREAKER TO BE PROVIDED.

D. **"#"** IN PANEL SCHEDULES INDICATES GFI BREAKER TO BE PROVIDED.

E. **"$"** IN PANEL SCHEDULES INDICATES LOCK–ON TYPE BREAKER TO BE PROVIDED.

F. **"$$"** IN PANEL SCHEDULES INDICATES LOCK–OFF TYPE BREAKER TO BE PROVIDED.

G. E.C. SHALL VERIFY & REUSE THE ACTUAL BREAKERS, CABLES & POLES AS PER SITE CONDITION FOR EXISTING RECEPTACLES AND OTHER PLUMBING/HVAC EQUIPMENT AND RE–ADJUST THE CIRCUITS AS REQUIRED. REPORT IF ANY DISCREPANCIES ARE OBSERVED. PROVIDE NEW IF FOUND IN–OPERABLE. BASE BID ACCORDINGLY.

1 ELECTRICAL PANEL SCHEDULES
N.T.S

Property of NY Engineering

A PROJECT OF:
ANGIES FOOD CONCEPTS, LLC

ISSUE

SHEET:
E5.2

PLUMBING LEGEND

SYMBOL	DESCRIPTION
SAN	SANITARY WASTE (ABOVE FLOOR)
SAN	SANITARY SEWER (UNDER FLOOR)
GW	GREASE WASTE (UNDER FLOOR)
V	VENT PIPING
G	GAS PIPING
	COLD WATER
	HOT WATER
	HOT WATER RETURN
	P-TRAP
	PIPE DROP
	PIPE UP
	BALANCING VALVE
	SHUT-OFF VALVE
	GAS PLUG VALVE
	POINT OF NEW CONNECTION
	FILTER WATER
	BACKFLOW PREVENTER
	DISCONNECTION
CD	CONDENSATE DRAIN

PLUMBING ABBREVIATION

WCO	WALL CLEANOUT
CODP	CLEAN OUT DECK PLATE
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
S	SOIL
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EX.	EXISTING
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
BFP	BACK FLOW PREVENTER
WH	HOT WATER HEATER
SV	SHUTOFF VALVE
RCP	RECIRCULATION PUMP
ET	EXPANSION TANK
HB	HOSE BIBB
FS	FLOOR SINK
MS	MOP SINK
GW	GREASE WASTE
HD	HUB DRAIN
CD	CONDENSATE DRAIN
FW	FILTER WATER

PLUMBING DRAWING LIST

P0.1	PLUMBING SYMBOLS, ABBREVIATIONS, NOTES & SPECIFICATIONS
P0.2	PLUMBING SPECIFICATIONS
P1.1	PLUMBING WATER & GAS SUPPLY PLAN
P1.2	PLUMBING SANITARY & VENT PLAN
P1.3	PLUMBING ROOF PLAN
P2.1	PLUMBING DETAILS (1 OF 2)
P2.2	PLUMBING DETAILS (2 OF 2)
P3.1	PLUMBING SCHEDULES
P4.1	PLUMBING RISERS (1 OF 2)
P4.2	PLUMBING RISERS (2 OF 2)

CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:

A. 2024 INTERNATIONAL BUILDING CODE

B. 2024 INTERNATIONAL PLUMBING CODE

C. 2024 INTERNATIONAL MECHANICAL CODE

D. 2024 INTERNATIONAL FUEL GAS CODE

E. 2024 INTERNATIONAL ENERGY CONSERVATION CODE

F. 2024 INTERNATIONAL FIRE CODE

H 2023 NATIONAL ELECTRICAL CODE.

PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, GREASE WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE LOCAL AMENDMENTS TO REQUIREMENTS OF 2024 INTERNATIONAL PLUMBING CODE & 2024 INTERNATIONAL ENERGY CONSERVATION CODE.
2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 702.2, IPC 2024.
3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION 305, IPC 2024.
4. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IN PC 303, PC 402, PC 605, PC 702, PC 802.2, PC 902 & PC 1004.
5. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 4, 5, 6, 7, AND 9.
6. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER SECTION PC 1002 AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENT OF SECTION PC 708.
7. GREASE INTERCEPTOR SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 1003.
8. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308.
9. 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.
10. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701 THROUGH PC 711.
11. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTION PC 901 THROUGH PC 912.
12. INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH REQUIREMENTS OF SECTION PC 312.

PLUMBING SPECIFICATIONS

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

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

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

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

D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISIONAL 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. 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. 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. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.

E. 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.

F. 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.

G. 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 2024 INTERNATIONAL PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.04 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.

1.05 PRODUCTS

A. SANITARY AND VENT PIPING:

1. ABOVE GRADE / UNDERGROUND PIPING SHALL BE PVC / CAST IRON PIPE WHICH SHOULD COMPLY WITH ASTM A74 / ASTM D2665 / CISPI 301 STANDARD, AS PER APPROVED MATERIAL BY LOCAL AHJ.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE 3" TO 6" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 2-1/2" AND SMALLER (I.D.). SLOPE OF GREASE SANITARY SYSTEM SHALL NOT BE LESS THAN 1/4" PER FOOT OF RUN. VENT PIPING SHALL BE PITCHED TO DRAIN.
3. PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES. USE OF COMBUSTIBLE MATERIALS IS NOT ALLOWED IN THE RETURN AIR PLENUM. MATERIALS USED IN THE PLENUM SHALL HAVE FLAME SPREAD RATING NOT TO EXCEED 25 AND SMOKE DEVELOPED RATING NOT TO EXCEED 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL723.
4. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE CROSS LINKED POLYETHYLENE WHICH SHOULD COMPLY WITH ASTM F876/ASSE 1061 OR TYPE 'L' HARD-DRAWN COPPER TUBE WHICH SHOULD COMPLY WITH ASTM B42/ASME B16.15 OR CPVC WHICH SHOULD COMPLY WITH ASTM D2846/ASSE 1061. AS PER APPROVED MATERIAL BY LOCAL AHJ.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE FITTING FOR CROSS-LINKED POLYETHYLENE (PEX) PLASTIC TUBING, COPPER OR COPPER ALLOY AS PER APPROVED STANDARDS.
3. JOINTS SHALL BE MECHANICAL OR PUSH FIT JOINT FOR CROSS-LINKED POLYETHYLENE (PEX) PLASTIC TUBING AND MADE WITH LEAD-FREE SOLDER FOR COPPER TUBE.
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. PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES. USE OF COMBUSTIBLE MATERIALS IS NOT ALLOWED IN THE RETURN AIR PLENUM. MATERIALS USED IN THE PLENUM SHALL HAVE FLAME SPREAD RATING NOT TO EXCEED 25 AND SMOKE DEVELOPED RATING NOT TO EXCEED 50 WHEN TESTED IN ACCORDANCE WITH ASTM E84 OR UL723.
7. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2024 INTERNATIONAL ENERGY CONSERVATION CODE SECTION C404.4 REFER BELOW TABLE C403.13.3 FOR MINIMUM PIPE INSULATION THICKNESS.

MINIMUM PIPE INSULATION THICKNESS							
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU·IN./(H·FT2·°F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8	>8
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

8. WATER DISTRIBUTION SYSTEM AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2024 C404.6, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
   a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
   b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).
9. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2024 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.
10. HEATED WATER SUPPLY PIPING SHALL BE IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE 2024 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 INTERNATIONAL ENERGY CONSERVATION CODE 2024 SECTION 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
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'

C. GAS PIPING

1. PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS FIRED EQUIPMENT AND EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON DRAWINGS AS PER 2024 INTERNATIONAL FUEL GAS CODE.
2. NATURAL GAS PIPING SHALL BE AS FOLLOWS:

   ASTM A-53 SCHEDULE 40 STEEL PIPE PAINTED WITH YELLOW ANTI-CORROSIVE PAINT, SCREWED OR WELDED IN ACCORDANCE WITH CODE REQUIREMENT (FITTINGS FOR LINES LARGER THAN 2" SHALL BE WELDED STEEL FITTINGS FOR LINES 2" AND SMALLER, EXCEPT WHEN LOCATED IN AIR PLENUMS, SHALL BE SCREWED STANDARD WEIGHT BLACK MALLEABLE).
3. PROVIDE ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS REQUIRED BY NFPA-54 AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION.
4. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.
5. PAINT ALL GAS PIPING EXPOSED TO WEATHER WITH ONE COAT OF PRIMER, AND TWO COATS OF RUST-PROOF PAINT. COLOR OF PIPE ON ROOF SHALL BE YELLOW. COORDINATE COLOR OF PIPE ON EXTERIOR OF BUILDING WITH GC TO MATCH BUILDING COLORS.
6. GAS COCKS 1-1/2" AND SMALLER SHALL BE ALL BRONZE, SCREWED, FLAT HEAD, BRASS PLUG AND WASHER 200 LB NOG PROVIDE LINE SIZE 6" LONG DIRT LEG DOWN STREAM OF GAS COCK AT ALL EQUIPMENT CONNECTIONS.
7. NO VALVES ARE TO BE LOCATED IN AIR PLENUMS.
8. PROVIDE GAS PIPE SUPPORTS IN ACCORDANCE WITH 2024 IFGC CODE REQUIREMENTS.

D. PRESS JOINERY SYSTEM:

a. FITTINGS ½" – 4":

   WHERE APPROVED BY THE LOCAL JURISDICTION, THE VIEGA PRO PRESS OR SIMILAR 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 FITTINGS SHALL BE THIRD-PARTY CERTIFIED TO SF/ANSI 61 ANNEX G. 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. VIEGA 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 VIEGA. ALL FITTINGS, VALVES AND TOOLS SHALL BE PROVIDED BY SAME MANUFACTURER.

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. VIEGO PRO OR SIMILAR 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.

c. 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.

E. CHECK VALVES: (BACKFLOW PREVENTION)

   VALVES WITH PRESS-TO-CONNECT ENDS SHALL BE RATED TO 200 PSI CWP AT +250°F MAXIMUM. VIEGO PRO OR SIMILAR 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.

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

   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 ELECTROMETRIC SEALS SHALL HAVE LEAK DETECTION DESIGN.

G. 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 BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: I 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.

H. GAS FIRED WATER HEATER

1. GAS FIRED TANKLESS WATER HEATER IS PROPOSED. PLEASE REFER WATER HEATER SCHEDULE FOR DETAILS.

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2. BURNER SHALL BE ALUMINIZED STEEL OR CAST IRON, ADJUSTABLE, OR SELF–ADJUSTING AIR–GAS MIXTURE CONTROL.

3. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH 2024 INTERNATIONAL PLUMBING CODE AND THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.

4. THE OUTER JACKET SHALL BE STEEL WITH BAKED ENAMEL/ACRYLIC FINISH AND SHALL BE PROVIDED WITH ACCESS DOOR FOR SERVICING CONTROLS AND BURNER.

5. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

I. HOT WATER RE–CIRCULATING PUMP

1. IN–LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF 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.

J. 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 110°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.

K. 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.

L. 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.

M. 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.

2. 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 BRUSHED NICKEL 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, BRUSHED 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.

   d. HOUSE TRAP

   - SERVICE WEIGHT CAST IRON SOIL PIPE RUNNING TRAP WITH BELL AND SPIGOT ENDS AND TWO CLEANOUT HUBS.

   e. FRESH AIR INTAKE

   - PIPE MATERIAL SHOULD BE SAME AS DRAINAGE SYSTEM AT POINT OF CONNECTION
   - 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 .

N. VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES.

O. 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.

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

Q. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL. REMOVE PROTECTIVE COATINGS PRIOR TO INSTALLATION.

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

S. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

U. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

W. 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.

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

Y. 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.

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

AA. CONNECT GAS PIPING TO ALL GAS–FIRED EQUIPMENT WITH GAS COCK, DIRT LEG AND UNION.

AB. FOR ALL GAS–FIRED EQUIPMENT, VERIFY INPUT RATING AND PRESSURE REQUIREMENTS. PROVIDE GAS PRESSURE REGULATORS VENTED TO THE BUILDING EXTERIOR ON GAS SUPPLY TO ALL EQUIPMENT REQUIRING LOWER THAN LINE GAS PRESSURE.

AC. ALL PIPING INSTALLED ON THE ROOF SHALL BE SUPPORTED BY "PILLOW BLOCK" PIPE STANDS AS MANUFACTURED BY MIRO INDUSTRIES, OR APPROVED EQUAL. WOOD PIPE SUPPORTS SHALL NOT BE ACCEPTABLE. PROVIDE TRAFFIC/WALK PADS BELOW ALL PIPE STANDS. AE.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. AF.PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK–CLOSING VALVES.

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

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

AF. 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

COVER ALL HOT WATER AND HOT WATER RECIRCULATION 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 WITH MANVILLE ZESTON 2000 PVC INSULATED FITTING COVERS. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE 225 CMR REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 450. ALL PIPE INSULATION SHALL COMPLY WITH 2024 INTERNATIONAL 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. 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.

J. ALL EQUIPMENT WILL BE FACTORY TESTED.

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

L. TESTING REQUIREMENTS

1. TEST ALL DOMESTIC WATER PIPING HYDROSTATICALLY TO 125 PSIG.
2. HYDROSTATIC TEST PRESSURES SHALL REMAIN CONSTANT WITH NO VARIATION FOR 120 MINUTES.

M. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.

N. 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.

O. 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.

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

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.

B. 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.

C. 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.

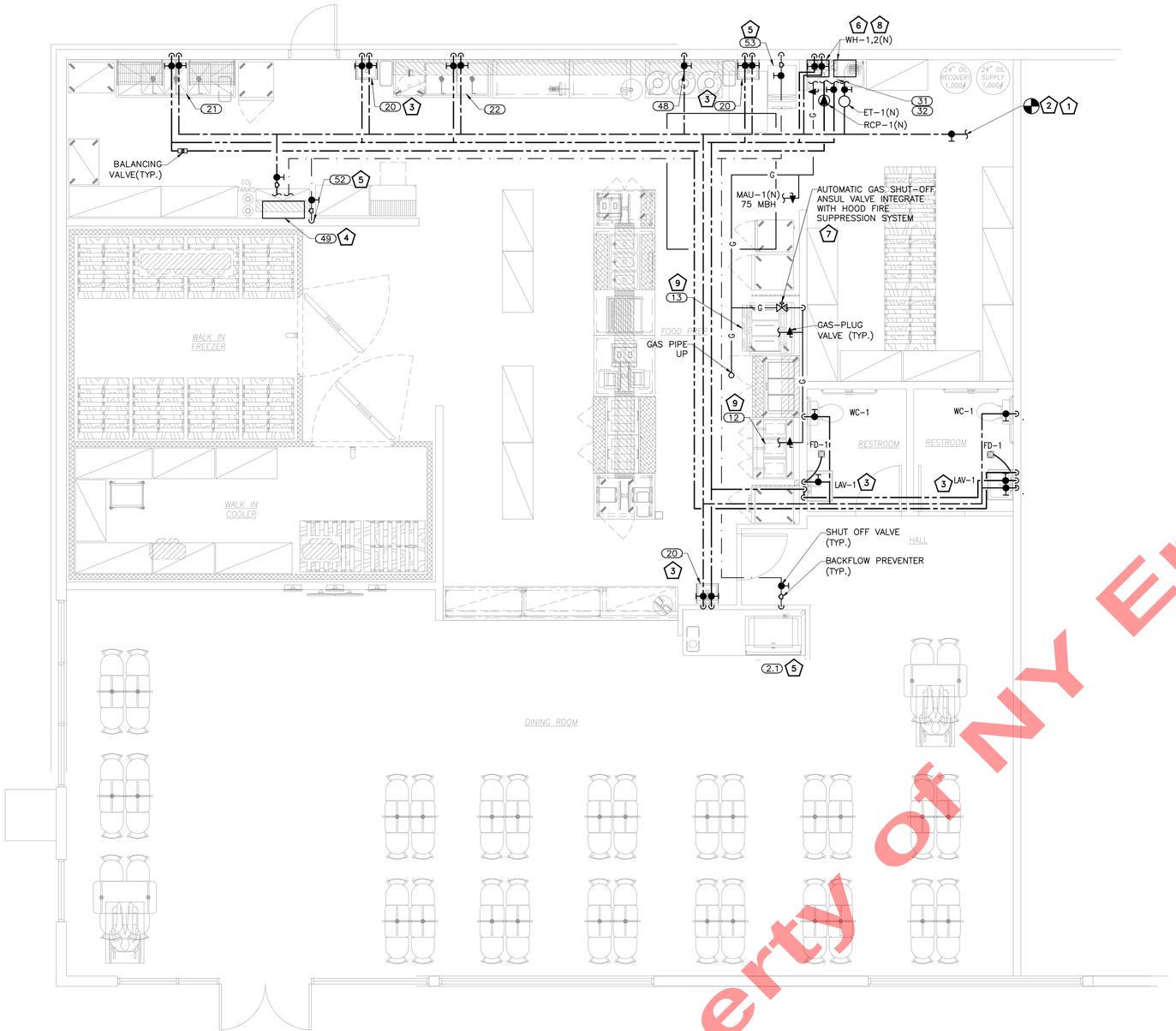
D. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, PLUMBING CONTRACTOR AND SUBCONTRACTORS.

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1 PLUMBING WATER & GAS SUPPLY FLOOR PLAN
1/4" = 1'-0"

FIELD VERIFICATION NOTES :

1. THE PLUMBING CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID TO FIELD VERIFY ALL EXISTING CONDITIONS WHICH MAY AFFECT HIS BID. THE FOLLOWING ITEMS SHALL BE VERIFIED.
   A) EXACT PLACEMENT SIZE CAPACITY MANUFACTURER AND CONDITION OF ALL EXISTING PLUMBING EQUIPMENT WITHIN SCOPE OF WORK, WHETHER SPECIFICALLY SHOWN OR NOT.
   B) SIZE AND LOCATION OF ALL EXISTING WASTE, GREASE WASTE, VENT AND WATER PIPING.
2. ALL REFERENCES ON THESE DRAWINGS TO EXISTING EQUIPMENT, WATER, WASTE, GREASE WASTE AND VENT PIPING ARE FOR REFERENCE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL THESE ITEMS PRIOR TO BID AND INCLUDE IN HIS BID ANY AND ALL AMOUNTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS.
3. NO ALLOWANCES WILL BE MADE AFTER THE PROJECT HAS BEEN AWARDED FOR FAILURE TO VERIFY EXISTING CONDITIONS.
4. ANY DISCREPANCIES WHICH MAY AFFECT THE CONTRACTORS BID SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND ARCHITECT FOR DIRECTION.

WATER GENERAL NOTES:

A. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER APPLICABLE ENERGY CODE (REFER SHEET P0.1)
B. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
C. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
D. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
E. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
F. ANY ROOF PENETRATION SHALL BE PERFORMED BY LANDLORD'S ROOFERS AT LANDLORD OPTION, A BONDED ROOFER APPROVED IN ADVANCE BY LANDLORD.
G. PROVIDE TRAP PRIMER/ SEAL IN FLOOR DRAIN AS PER LOCAL JURISDICTION.
H. ALL MATERIAL INDICATED AND IMPLIED ON THESE DRAWINGS SHALL BE NEW UNLESS OTHERWISE NOTED.
I. CONTRACTOR SHALL FIELD-VERIFY ALL EXISTING PIPING AND UTILITIES PRIOR TO COMMENCEMENT OF WORK. EXISTING PIPING SHALL BE REUSED WHERE FEASIBLE AND FOUND TO BE IN GOOD CONDITION. PROVIDE NEW PIPING WHERE EXISTING SYSTEMS ARE DAMAGED, INADEQUATE, OR OTHERWISE UNSUITABLE FOR REUSE.

HEALTH DEPARTMENT NOTES:

A. FOOD PREPARATION, DISHWASHING, STORAGE, AND RESTROOM AREAS TO HAVE:
   a) DURABLE, EASILY CLEANABLE, AND PROPER COVED BASE FLOORS.
   b) SMOOTH, NON-ABSORBENT, AND EASILY CLEANABLE LIGHT-COLORED WALLS AND CEILINGS.
B. ICE MACHINE BINS, CONDENSATE LINES, FOOD PREPARATION/WASH SINKS, DISHWASHERS, AND WATER/BEVERAGE DISPENSING SYSTEMS SHALL DRAIN INDIRECTLY INTO A FLOOR SINK WITH MINIMUM 1" AIR GAP OR AS REQUIRED PER LOCAL CODES.
C. OPERATOR TO OBTAIN FOOD CERTIFICATE PRIOR TO OPENING.
D. A HAND WASHING SINK SHALL BE PROVIDED IN THE FOOD PREPARATION AREA.
E. ALL FOOD EQUIPMENT, INCLUDING CUSTOM SINKS AND WORKTABLES, SHALL MEET THE APPROVED ANSI/NSF (AMERICAN NATIONAL STANDARDS INSTITUTE/NATIONAL SANITATION FOUNDATION) STANDARD FOR ITS CLASS.
F. FLOOR MODEL EQUIPMENT SHALL BE MOUNTED ON A MINIMUM OF SIX INCH LEGS, CASTERS, OR BE SEALED TO AN ELEVATED FOUR INCH HIGH CURB WITH A FOUR INCH HIGH COVE BASE.
G. ENTIRE FACILITY TO BE IN CURRENT COMPLIANCE WITH ALL COUNTY HEALTH CODES.

PLUMBING WATER & GAS SUPPLY KEYED NOTES:

1. CONNECT NEW 1-1/2" CW PIPING TO THE EXISTING WATER LINE IN SPACE. CONTRACTOR TO FIELD VERIFY ROUTING AND LOCATION OF EXISTING CW LINE & AVAILABILITY OF EXISTING WATER METER & BACKFLOW PREVENTER. IF REQUIRED PROVIDE NEW APPROVED BACKFLOW PREVENTER DEVICE AND WATER METER ON DOMESTIC WATER SERVICE AS PER LOCAL CODE AND AHJ REQUIREMENTS. COORDINATE WITH OWNER & BID BASE ACCORDINGLY.
2. CONTRACTOR TO FIELD VERIFY INCOMING WATER PRESSURE IS GREATER THAN 65 PSI. PROVIDE WATER BOOSTER PUMP IF PRESSURE IS LESS THAN 65 PSI. ADD ALTERNATE OPTION IN BID ACCORDINGLY.
3. PROVIDE ASSE 1070 OR SIMILAR THERMOSTATIC MIXING VALVE AT ALL HAND SINK AND LAVATORIES IF NOT ALREADY PROVIDED. SET AT 110°F MAXIMUM.
4. PROPOSED NEW WALL MOUNTED WATER FILTRATION SYSTEM. CONTRACTOR TO COORDINATE WITH MANUFACTURER & VERIFY IN FIELD FOR INDIRECT WASTE DRAIN REQUIREMENT & ROUTE INDIRECT DRAIN TO NEAREST FLOOR SINK IF NECESSARY.
5. PROVIDE A PRESSURE REDUCING VALVE, BACK FLOW PREVENTER AND SHUT-OFF VALVE AT PLUMBING CONNECTIONS TO KITCHEN EQUIPMENTS.
6. PROVIDE NEW GAS FIRED TANK-LESS WATER HEATERS (WH-1,2(N)) WITH RE-CIRCULATION PUMP (RCP-1) & EXPANSION TANK (ET-1). REFER SCHEDULE.
7. CONTRACTOR TO PROVIDE NEW AUTOMATIC GAS SHUT OFF (ANSUL) VALVE & INTEGRATE WITH ANSUL FIRE PROTECTION SYSTEM AT HOOD. COORDINATE ANSUL GAS SHUT OFF VALVE REQUIREMENTS WITH HOOD VENDOR & ELECTRICAL CONTRACTOR.
8. 1-1/4" GAS PIPE CONNECT TO WATER HEATER. PROVIDE SHUT-OFF VALVE AND 6" DIRT LEG. GAS CONTRACTOR TO ENSURE THE EQUIPMENT RECEIVE SUFFICIENT GAS PRESSURE FOR EFFICIENT OPERATION.
9. CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR ITEM-12 & ITEM-13 & SHALL NOT EXCEED MAXIMUM GAS PRESSURE REQUIREMENT OF EQUIPMENT. REFER TO EQUIPMENT CUT SHEET FOR MAXIMUM AND MINIMUM ALLOWABLE NATURAL GAS PRESSURE AND PROVIDE REGULATOR IF REQUIRED.

PLUMBING LEGEND

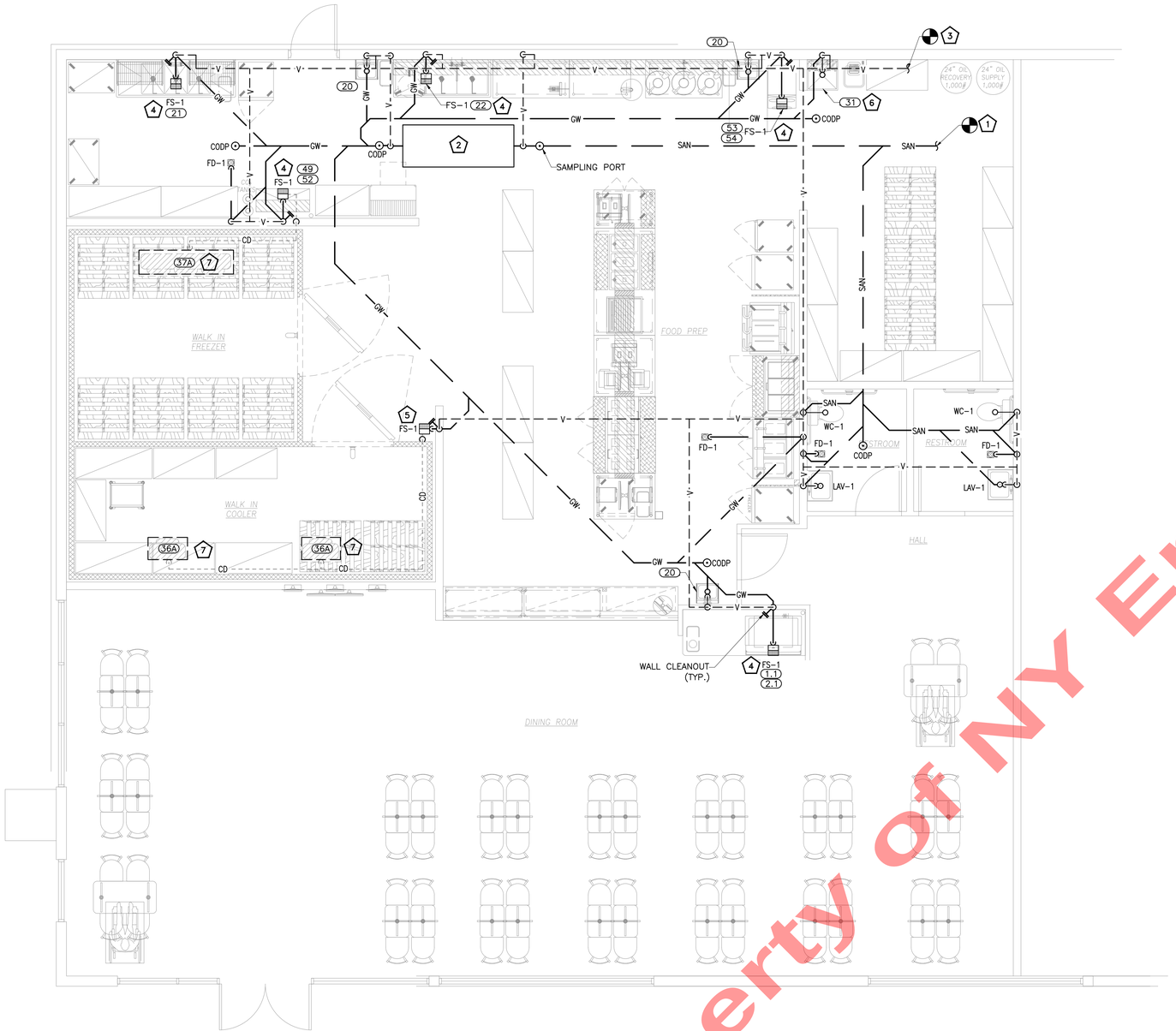
SYMBOL	DISCRIPTION
SAN	SANITARY WASTE (ABOVE FLOOR)
SAN	SANITARY SEWER (UNDER FLOOR)
GW	GREASE WASTE (UNDER FLOOR)
	VENT PIPING
G	GAS PIPING
	COLD WATER
	HOT WATER
	HOT WATER RETURN
	P-TRAP
	PIPE DROP
	PIPE UP
	BALANCING VALVE
	SHUT-OFF VALVE
	GAS PLUG VALVE
	POINT OF NEW CONNECTION
	FILTER WATER
	BACKFLOW PREVENTER
CD	CONDENSATE DRAIN

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SHEET:
P1.1



1 PLUMBING SANITARY & VENT FLOOR PLAN
1/4" = 1'-0"

N

WATER GENERAL NOTES:

A. UNLESS OTHERWISE NOTED, SLOPE OF DRAINAGE SYSTEM TO BE 1/8" PER FOOT OF RUN FOR PIPE 3" OR LARGER AND 1/4" PER FOOT FOR PIPE SMALLER THAN 3".

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

C. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.

D. ALL MATERIAL INDICATED AND IMPLIED ON THESE DRAWINGS SHALL BE NEW UNLESS OTHERWISE NOTED.

E. ALL CLEANOUTS TO BE ACCESSIBLE.

F. ANY ROOF PENETRATION SHALL BE PERFORMED BY LANDLORD'S ROOFERS AT LANDLORD OPTION, A BONDED ROOFER APPROVED IN ADVANCE BY LANDLORD.

G. PROVIDE TRAP PRIMER/ SEAL IN FLOOR DRAIN AS PER LOCAL JURISDICTION.

H. CONTRACTOR TO CO-ORDINATE WITH MECHANICAL CONTRACTOR FOR CONDENSATE DRAIN. EXTEND AND SPILL THE CONDENSATE DRAIN PIPE TO NEAREST DRAIN WITH APPROVED AIR GAP. REFER DETAILS ON SHEET P2.2 DETAIL #2 FOR PIPE SIZE & LOCATION.

I. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING PIPING AND UTILITIES PRIOR TO COMMENCEMENT OF WORK. EXISTING PIPING SHALL BE REUSED WHERE FEASIBLE AND FOUND TO BE IN GOOD CONDITION. PROVIDE NEW PIPING WHERE EXISTING SYSTEMS ARE DAMAGED, INADEQUATE, OR OTHERWISE UNSUITABLE FOR REUSE.

FIELD VERIFICATION NOTES :

1. THE PLUMBING CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID TO FIELD VERIFY ALL EXISTING CONDITIONS WHICH MAY AFFECT HIS BID. THE FOLLOWING ITEMS SHALL BE VERIFIED.

   A) EXACT PLACEMENT, SIZE, CAPACITY, MANUFACTURER AND CONDITION OF ALL EXISTING PLUMBING EQUIPMENT WITHIN SCOPE OF WORK, WHETHER SPECIFICALLY SHOWN OR NOT.

   B) SIZE AND LOCATION OF ALL EXISTING WASTE, GREASE WASTE, VENT AND WATER PIPING.

2. ALL REFERENCES ON THESE DRAWINGS TO EXISTING EQUIPMENT, WATER, WASTE, GREASE WASTE AND VENT PIPING ARE FOR REFERENCE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL THESE ITEMS PRIOR TO BID AND INCLUDE IN HIS BID ANY AND ALL AMOUNTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS.

3. NO ALLOWANCES WILL BE MADE AFTER THE PROJECT HAS BEEN AWARDED FOR FAILURE TO VERIFY EXISTING CONDITIONS.

4. ANY DISCREPANCIES WHICH MAY AFFECT THE CONTRACTORS BID SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND ARCHITECT FOR DIRECTION.

HEALTH DEPARTMENT NOTES:

A. FOOD PREPARATION, DISHWASHING, STORAGE, AND RESTROOM AREAS TO HAVE:

   a) DURABLE, EASILY CLEANABLE, AND PROPER COVED BASE FLOORS.

   b) SMOOTH, NON-ABSORBENT, AND EASILY CLEANABLE LIGHT-COLORED WALLS AND CEILINGS.

B. ICE MACHINE BINS, CONDENSATE LINES, FOOD PREPARATION/WASH SINKS, DISHWASHERS, AND WATER/BEVERAGE DISPENSING SYSTEMS SHALL DRAIN INDIRECTLY INTO A FLOOR SINK WITH MINIMUM 1" AIR GAP OR AS REQUIRED PER LOCAL CODES.

C. OPERATOR TO OBTAIN FOOD CERTIFICATE PRIOR TO OPENING.

D. A HAND WASHING SINK SHALL BE PROVIDED IN THE FOOD PREPARATION AREA.

E. ALL FOOD EQUIPMENT, INCLUDING CUSTOM SINKS AND WORKTABLES, SHALL MEET THE APPROVED ANSI/NSF (AMERICAN NATIONAL STANDARDS INSTITUTE/NATIONAL SANITATION FOUNDATION) STANDARD FOR ITS CLASS.

F. FLOOR MODEL EQUIPMENT SHALL BE MOUNTED ON A MINIMUM OF SIX INCH LEGS, CASTERS, OR BE SEALED TO AN ELEVATED FOUR INCH HIGH CURB WITH A FOUR INCH HIGH COVE BASE.

G. ENTIRE FACILITY TO BE IN CURRENT COMPLIANCE WITH ALL COUNTY HEALTH CODES.

PLUMBING WATER SUPPLY KEYED NOTES:

1. CONNECT NEW 4" SANITARY LINE TO EXISTING SANITARY WASTE LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXISTING SANITARY LINE SIZE, LOCATION AND INVERT. RE-ROUTE PIPING AS PER SITE CONDITION IF REQUIRED. BASE BID ACCORDINGLY.
2. PROVIDE NEW SCHIER GB-250 (UNDERGROUND) HYDROMECHANICAL GREASE INTERCEPTOR (GI-1). CONTRACTOR TO VERIFY REQUIRED INSTALLATION LOCATION AND INVERT IN FIELD AS PER EXISTING SANITARY LINE PRIOR TO BID. BASE BID ACCORDINGLY.
3. CONNECT NEW 3" VENT PIPE TO EXISTING VTR IN SPACE. VTR MUST BE NOT LESS THAN 3" & LOCATED ATLEAST 10' AWAY FROM ANY FRESH AIR INTAKE UNIT. CONTRACTOR TO FIELD VERIFY SIZE & LOCATION OF EXISTING VTR AND REROUTE PIPE ACCORDINGLY. PROVIDE NEW VTR IF EXISTING IS NOT SUFFICIENT OR NOT AVAILABLE.
4. ROUTE INDIRECT WASTE FROM KITCHEN EQUIPMENT TO THE FLOOR SINK WITH APPROVED AIR GAP.
5. CONDENSATE DRAIN SHALL BE ROUTE TO THE NEAREST DRAIN WITH APPROVED AIR GAP.
6. ROUTE INDIRECT WASTE FROM WATER HEATER (WH-1,2(N)) TO MOP SINK WITH APPROVED AIR GAP.
7. CONTRACTOR SHALL FIELD VERIFY FINAL LOCATION OF WALK-IN COOLER AND FREEZER UNITS. VERIFY CONDENSATE DRAIN REQUIREMENTS PER MANUFACTURER. PROVIDE INDIRECT CONDENSATE DRAIN CONNECTION AND DISCHARGE TO NEAREST APPROVED DRAIN WITH PROPER AIR GAP, AS REQUIRED BY CODE.

PLUMBING LEGEND

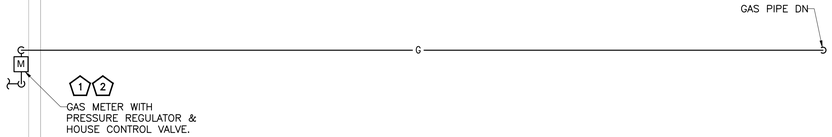
SYMBOL	DISCRIPTION
SAN	SANITARY WASTE (ABOVE FLOOR)
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	VENT PIPING
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	COLD WATER
	HOT WATER
	HOT WATER RETURN
	P-TRAP
	PIPE DROP
	PIPE UP
	BALANCING VALVE
	SHUT-OFF VALVE
	GAS PLUG VALVE
	POINT OF NEW CONNECTION
	FILTER WATER
	BACKFLOW PREVENTER
CD	CONDENSATE DRAIN

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SHEET:
P1.2



1 PLUMBING ROOF PLAN
1/4" = 1'-0"

N

FIELD VERIFICATION NOTES :

1. THE PLUMBING CONTRACTOR SHALL VISIT THE SITE PRIOR TO BID TO FIELD VERIFY ALL EXISTING CONDITIONS WHICH MAY AFFECT HIS BID. THE FOLLOWING ITEMS SHALL BE VERIFIED.

   A) EXACT PLACEMENT, SIZE, CAPACITY, MANUFACTURER AND CONDITION OF ALL EXISTING PLUMBING EQUIPMENT WITHIN SCOPE OF WORK, WHETHER SPECIFICALLY SHOWN OR NOT.

   B) SIZE AND LOCATION OF ALL EXISTING SANITARY WASTE, GREASE WASTE, VENT AND WATER PIPING.

2. ALL REFERENCES ON THESE DRAWINGS TO EXISTING EQUIPMENT, WATER, SANITARY WASTE, GREASE WASTE AND VENT PIPING ARE FOR REFERENCE ONLY. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL THESE ITEMS PRIOR TO BID AND INCLUDE IN HIS BID ANY AND ALL AMOUNTS REQUIRED TO ACCOMMODATE EXISTING CONDITIONS.

3. NO ALLOWANCES WILL BE MADE AFTER THE PROJECT HAS BEEN AWARDED FOR FAILURE TO VERIFY EXISTING CONDITIONS.

4. ANY DISCREPANCIES WHICH MAY AFFECT THE CONTRACTORS BID SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND ARCHITECT FOR DIRECTION.

(#) PLUMBING GAS SUPPLY KEYED NOTES:

1. CONNECT NEW 2" GAS PIPING TO NEW GAS METER. CONTRACTOR TO FIELD VERIFY NEW GAS METER LOCATION, SIZE & PRESSURE.

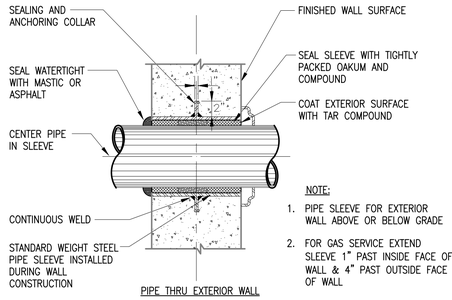
2. CONTRACTOR TO VERIFY EXACT LOCATION, PRESSURE AND SIZE OF GAS SERVICE WITH UTILITY COMPANY AND UPGRADE EXISTING GAS SERVICE & PROVIDE NEW GAS METER WITH PRESSURE REGULATOR AS REQUIRED. SET THE MAXIMUM PRESSUREA AS 14" W.C. AT GAS PRESSURE REGULATOR.

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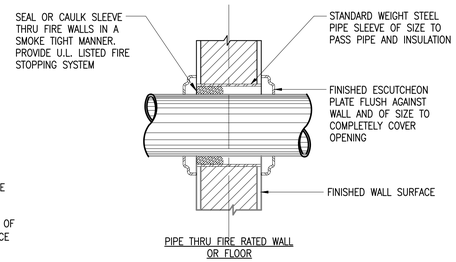
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P1.3



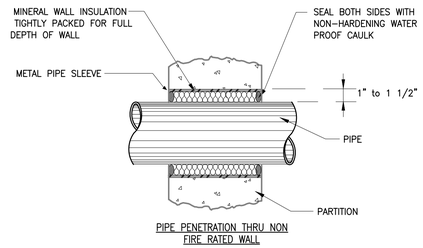
PIPE THRU EXTERIOR WALL

NOTE:

1. PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE
2. FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL & 4" PAST OUTSIDE FACE OF WALL



PIPE THRU FIRE RATED WALL OR FLOOR

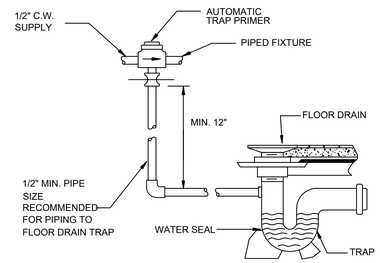


PIPE PENETRATION THRU NON FIRE RATED WALL

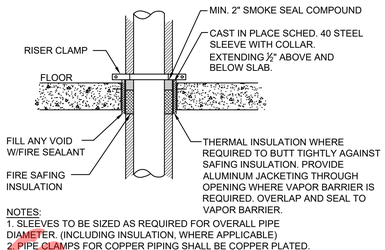
NOTE:

1. NOTE: PIPES PENETRATING FRAMING MEMBERS SHALL BE PROTECTED WHEN WITHIN 1 INCH OF THE OUTSIDE EDGE OF FRAMING WITH STEEL NAIL PLATES (MINIMUM 18 GAUGE) SHALL EXTEND BEYOND THE EDGE OF THE PIPE A MINIMUM 1 ½"ON EACH SIDE. PROTECT PIPING FROM SHARP EDGES OF METAL STUDS.

1 PIPE SLEEVE THRU WALL SECTION
N.T.S

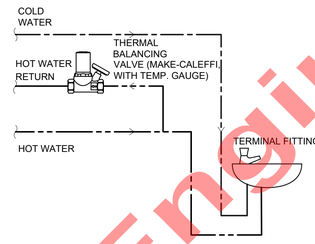


2 FLOW CONTROLLED TRAP PRIMER DETAIL
N.T.S

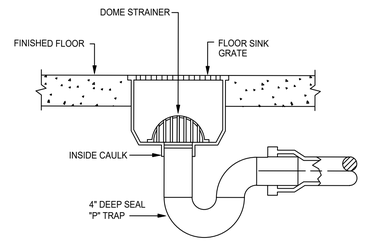


NOTES:
1. SLEEVES TO BE SIZED AS REQUIRED FOR OVERALL PIPE DIAMETER. (INCLUDING INSULATION, WHERE APPLICABLE)
2. PIPE CLAMPS FOR COPPER PIPING SHALL BE COPPER PLATED.

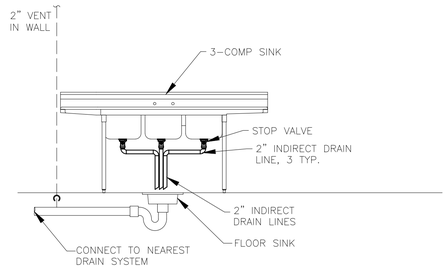
3 FLOOR PENETRATION DETAIL
N.T.S



4 BALANCING VALVE PIPING DETAIL
N.T.S



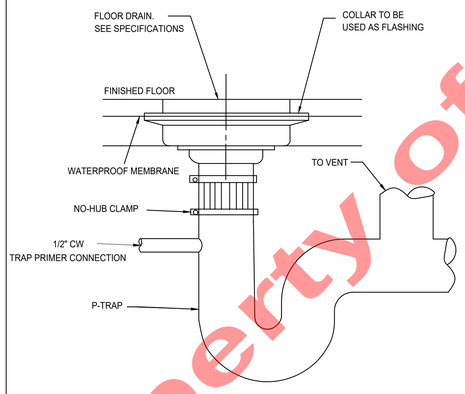
5 FLOOR SINK DETAILS
N.T.S



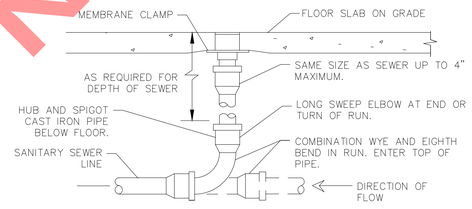
COMMENTS:

1. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS OR MEET LOCAL CODE REQUIREMENTS.
2. COORDINATE INDIVIDUAL BAY DRAINAGE, AIR GAP & DRAIN FUNNEL WITH LOCAL CODE REQUIREMENTS.

6 3 COMPARTMENT SINK DETAILS
N.T.S



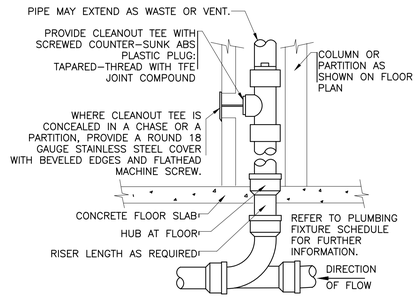
7 FLOOR DRAIN DETAIL
N.T.S



COMMENTS:

1. LOCATE AT BUILDING EXIT, AT ENDS OF RUNS, AT TURNS OF PIPE GREATER THAN 45 DEGREES, AT 50' INTERVALS ON STRAIGHT RUNS, AND/OR WHERE SHOWN ON PLANS. PROVIDE BACKFILL PER ARCHITECTURAL SPECIFICATIONS. LOCATE CLEANOUTS WHERE THERE IS 18" CLEAR AROUND. CONSULT LOCAL CODES FOR OTHER FCO REQUIREMENTS.
2. ROUND SECURED GASKETED NICKEL BRONZE ADJUSTABLE TOP WITH "CO" CAST IN COVER. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIATED FOR UNFINISHED FLOORS). PROVIDE GASKETED PLASTIC PLUG IN CAST IRON BODY. USE TEFLON JOINT COMPOUND ON PLUG THREADS. CLEAN THE TOP OF EXPOSED FCO AFTER INSTALLATION.

8 FLOOR CLEANOUT DETAIL
N.T.S



WALL CLEANOUT DETAIL NOTES:

1. PROVIDE WCO WHERE SHOWN ON PLAN, AND ON SANITARY WASTE BRANCHES NOT SERVED WITH A FLOOR CLEANOUT.
2. LOCATE ABOVE FIXTURE FLOOR RIM WITHIN 4' OF FLOOR.
3. CONSULT LOCAL CODES FOR OTHER WCO REQUIREMENTS.
4. LONG SWEEP AT END OF LINE OR COMBINATION WYE AND EIGHT BEND IN RUN OF LINE.
5. CLEAN OUT FACE SHALL BE WITHIN 4" OF WALL SURFACE. PROVIDE A PIPE EXTENSION IF REQUIRED.

9 WALL CLEANOUT DETAIL
N.T.S

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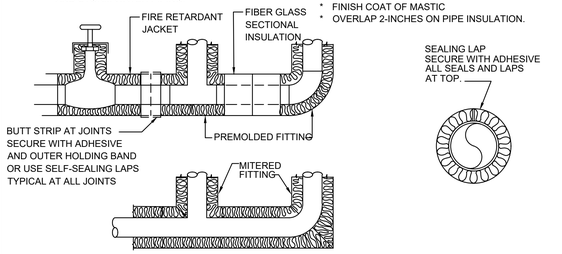
SHEET:
P2.1

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.

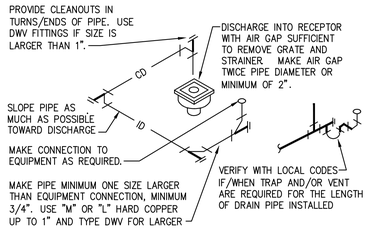
CONCEALED VALVES AND FITTINGS

- 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.



1 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS

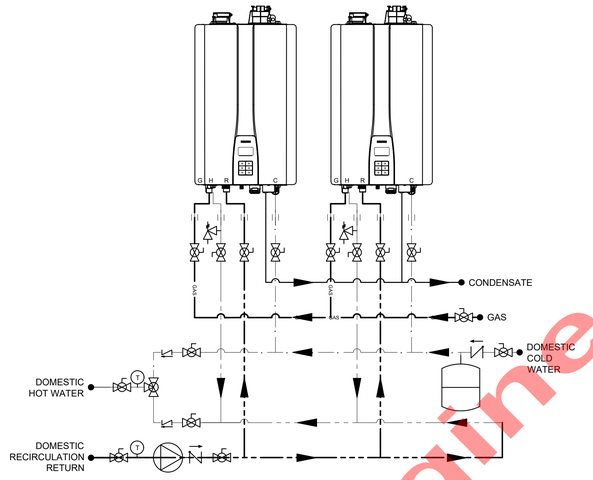
N.T.S



ROUTE PIPE INCONSPICULOUSLY AND UNOBTRUSIVELY, SECURED BY MEANS OF CLAMPS OR BRACKETS TO THEIR OWN EQUIPMENT UNIITS AND ROUTED TO THEIR SPECIFIC FLOOR SINKS. THERE SHALL NOT BE ANY LOOSE OR DANGLING WASTE LINES, NOR WASTE LINES LYING ON THE FLOOR. DO NOT INSULATE INDIRECT DRAIN PIPE WHEN INSTALLED EXPOSED IN FOOD SERVICE FACILITY. REFER TO LOCAL CODES FOR FURTHER INFORMATION.

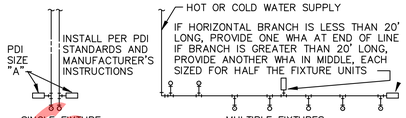
2 INDIRECT/CONDENSATE DRAIN

N.T.S



3 GAS FIRED INSTANTANEOUS WATER HEATER DETAIL (WH-1,2(N))

N.T.S



SINGLE FIXTURE

MULTIPLE FIXTURES

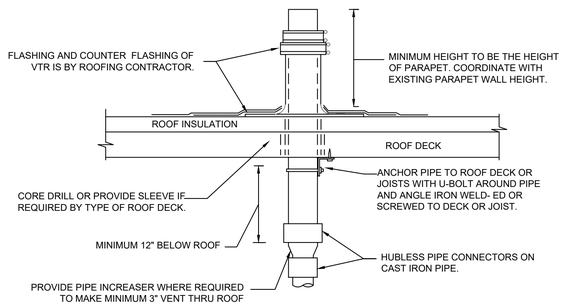
PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

FIXTURE UNIT TABULATION		
FIXTURE	COLD	HOT
VALVE WATER CLOSET	10	--
TANK WATER CLOSET	5	--
URINAL	5	--
LAVATORY/SINK	1.5	1.5
JANITOR'S SINK	3	3
SHOWER/BATHTUB	2	2

PC TO PROVIDE WATER HAMMER ARRESTERS BY SIOUX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUIVALENT WITH PISTON AND O-RING CONSTRUCTION, HAVING PDI #WH-201, ASSE #1010 AND ANSI #A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL IN LINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE THE UNITS AS SHOWN ON THE DRAWINGS AND/OR PER THE TABLES SHOWN ABOVE.

4 WATER HAMMER ARRESTORS

N.T.S



5 VENT THROUGH ROOF (VTR) DETAILS

N.T.S

SPECIFICATION NOTES

(1) 4" FPT inlet/outlet with 4" plain end fittings
(2) Unit weight: 236 lbs. For wet weight, add 2,310 lbs. For traffic-rated cover(s), add 90 lbs per cover. For pedestrian cover(s), add 7 lbs per cover.
(3) Maximum operating temperature: 150º F continuous
(4) Liquid Capacity: 277 gal
Grease Capacity (100 GPM): 1,895 lbs (260 gal)
Grease Capacity (150 GPM): 1,848 lbs (253 gal)
Solids Capacity: 69 gal
(5) Factory Rating:
Grease Capacity (250 GPM): 500 lbs (68 gal)
(6) For gravity drainage applications only
(7) Do not use for pressure applications
(8) Cover placement allows full access to tank for proper maintenance
(9) Vent not required unless per local code
(10) Engineered inlet and outlet diffusers with inspection ports are removable to inspect / clean piping
(11) Integral air relief / Anti-siphon / Sampling access
(12) Cover adapters provide an adjustable height range of 5"
(13) Designed for below-grade, above-grade, indoor or outdoor installations
(14) Safety Star® (450 lbs load capacity) is an access restrictor built into each cover adapter to prevent accidental entry into tanks

CERTIFIED PERFORMANCE

Great Basin® hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.

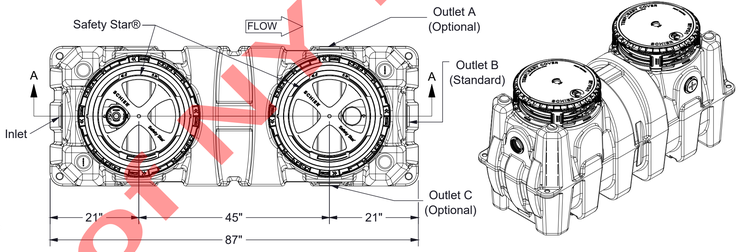
ENGINEER SPECIFICATION GUIDE

Schier Great Basin® grease interceptor model GB-250 shall be lifetime guaranteed and made in USA of seamless, molded polyethylene with minimum installation with adjustable cover adapter, Safety Star® access restrictor built into each cover adapter, and three outlet options. This unit is certified for hydromechanical performance to ASME A112.14.3 (Type D) and CSA B481.1. Interceptor flow rate shall be 100 GPM or 150 GPM. Interceptor grease capacity shall be 1,895 lbs @100 GPM or 1,848 lbs @150 GPM.

COVERS SOLD SEPARATELY

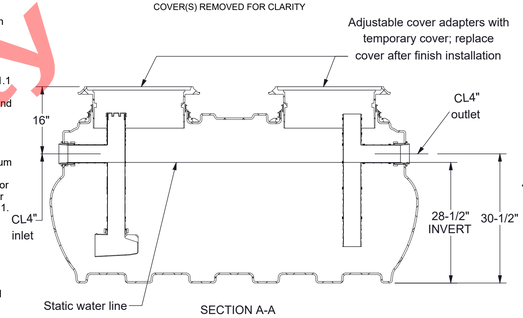
This unit is provided with temporary cover(s) intended for the duration of jobsite installation. Purchase one of the following finish covers.

- T24-GI (8044-000-01): Traffic-rated (AASHTO H-20) cast iron cover shall provide water/gas-tight seal and have a minimum of 16,000 lbs load capacity. For outdoor installation.
- P24-GI (8045-000-01): Pedestrian-rated poly cover shall provide water/gas-tight seal and have a minimum of 2,000 lbs load capacity. For indoor installation.

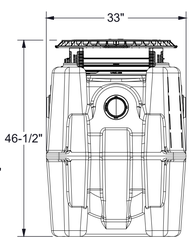


TOP VIEW
COVER(S) REMOVED FOR CLARITY

ISOMETRIC VIEW



SECTION A-A



INLET END VIEW

6 GREASE INTERCEPTOR (GI-1)

N.T.S

SPECIFICATION SHEET

SCHIER
6455 Woodland Dr
Shawnee, KS 66218
tel: 913-951-3300
fax: 913-951-3399
schierproducts.com
Made in the U.S.A.

MODEL NUMBER	GB-250		
PART NUMBER	4055-300-02		
DESCRIPTION	GB-250 GREASE INTERCEPTOR 100 GPM / 150 GPM, 4" PLAIN/FPT CONNECTIONS		
DRAWN BY	G.HEIDE		
DATE	2/25/2026	REVA	ECO00171

PROPRIETARY AND CONFIDENTIAL: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF SCHIER PRODUCTS. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF SCHIER PRODUCTS IS PROHIBITED.

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PLUMBING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	C.W.	H.W.	SAN DIRECT	SAN INDIRECT	VENT	SPECIFICATIONS
WC–1	WATER CLOSET	3/4"	–	4"	–	2"	"AMER. STD." MODEL # 2876.016.020 ADA COMPLIANT FLOOR SET FLUSH TANK TYPE CLOSE COUPLED TOILET WITH LOW CONSUMPTION 1.28 PRESSURE ASSIST, ELONGATED BOWL, BOLT DOWN LOCKING TANK LID, GLAZED TRAPWAY. OR EQUIVALENT.
LAV–1	LAVATORY	1/2"	1/2"	2"	–	1½"	AMERICAN STANDARD LUCERNE, 20 1/2" BY 18 1/4" NO 0355.012 w/ CONCEALED ARMS NO 700–27–M31 BY J. R. SMITH CO. FAUCET: ZURN, MODEL Z81104–XL. GRID DRAIN, 3/8" CHROME SUPPLIES WITH ANGLE STOPS, ADJUSTABLE "P" BRASS TRAP TO SUIT GRID DRAIN, TUBING DRAIN TO WALL, 1–1/4" INLET, 1–1/2" OUTLET, ESCUTCHEON – CHROME FINISH. INSTALL PER ADA REQUIREMENTS. OR EQUIVALENT.
FD–1	FLOOR DRAIN	–	–	–	3"	2"	J.R. SMITH: 2005 SERIES CAST IRON BODY WITH FLASHING COLLAR, NICKEL BRONZE ADJUSTABLE STRAINER SECURED GRATE TOP AND TRAP PRIMER CONNECTION. OR EQUIVALENT.
FS–1	FLOOR SINK	–	–	–	3"	2"	J.R. SMITH: (3001 SERIES) TYPE K FLOOR SINK IN KITCHEN AND FOOD SERVICE AREAS SHALL BE J.R. SMITH 3000 SERIES WITH SEDIMENT BUCKET AND 12 ½" NICKEL BRONZE SQUARE TOP 10" DEEP ½" GRATE. SEE PLAN FOR LOCATION. OR EQUIVALENT.

NOTES
1. PROVIDE SHUT OFF VALVES FOR ALL WATER LINES AT PLUMBING FIXTURES AND EQUIPMENT CONNECTIONS.
2. MAXIMUM FLOW FROM A SINK SHALL NOT EXCEED 2.2 GAL./MIN & LAV SHALL NOT EXCEED 0.5 GAL./MIN AT 60 PSI.
3. INSTALL TRAP PRIMER THAT SERVE THE RESTROOM & RELEVANT SPACE.
4. PROVIDE FLOW CONTROL TRAP PRIMER WITH ACCESS PANEL FOR FLOOR DRAINS.
5. THE TOP OF ALL FLOOR DRAINS SHALL BE FLUSH WITH THE ADJACENT FINISHED FLOOR.
6. ALL FLOOR DRAINS IN FINISHED AREAS AND ALL ROOF DRAINS SHALL BE LOCATED AS PER THE ARCHITECTURAL DRAWINGS.

PUMP SCHEDULE

TAG	DESCRIPTION	TYPE	CAPACITY GPM	CAPACITY HEAD (ft.)	ELECTRICAL DATA HP	V	PH	HZ	SELECTION BASED ON MANUFACTURER	MODEL NUMBER	REMARKS/OPTIONS
RCP–1	HOT WATER RECIRC. PUMP	IN–LINE	2.0	15	0.05	115	1	60	GRUNDFOS	ALPHA HWR 15–55 SF/T	NOTE 1,2

OPTIONS (ALL RCP UNITS)
- AQUA–STAT & NIGHT TIMER
- BALANCING VALVE & CHECK VALVE
- FLANGED PUMP
- MAINTENANCE BALL VALVES ON BOTH SIDES OF PUMP

NOTES:
1. SET AQUA–STAT WITH SET POINT 10 DEGREES BELOW SYSTEM SUPPLY TEMP. 2. INSTALL RECIRCULATION PUMP PER MANUFACTURERS REQUIREMENTS.

EXPANSION TANKS

UNIT	NUMBER	MANUFACTURER & MODEL NUMBER	SERVICE	TANK VOLUME (GAL)	ACCEPTANCE VOLUME (GAL)	PRESSURE RATING (PSI)	DIMENSIONS DIAMETER (INCH)	DIMENSIONS HEIGHT (INCH)	OPERATING WEIGHT (LBS)	NOTES
ET–1	1	AMTROL	ST–5C–DD	2	0.9	150	8	14	26	1,2

GENERAL NOTES:
1. SET THE TANK PRESSURE TO EQUAL THE SYSTEM OPERATING PRESSURE. TANK MUST BE DRAINED BEFORE ADJUSTING SET PRESSURE.
2. INSTALL PER MANUFACTURER'S RECOMMENDATIONS ON INCOMING COLD WATER LINE.

NEW GAS FIRED INSTANTANEOUS HOT WATER HEATER SCHEDULE

TAG	QUANTITY	FLOW RATE GPM @ RISE	TYPE	NATURAL GAS INPUT(BTU/H) PER HEATER	NATURAL GAS RECOVERY GPM @75° F RISE	UNIFORM ENERGY FACTOR (UEF)	MANUFACTURER & MODEL NO.	REMARK
WH–1,2(N)	2	3.2 GPM @ 75°F	GAS POINT OF USE WATER HEATER WITH INBUILT RECIRCULATION PUMP	120,000 BTU/H	3.2	0.96	NAVIEN NPE–150S2	DIMENSIONS 27.4"(H) X 17.3"(W) X 13.2"(D)

BACKFLOW PREVENTER SCHEDULE

LOCATION	TAG	MODEL	CERTIFICATION
BACKFLOW PREVENTER FOR CARBONATED BEVERAGE MACHINES	BFP	WATTS SD–3 OR EQUAL	ASSE 1022
BACKFLOW PREVENTER FOR COFFEE MACHINE & OTHER NON– CARBONATED BEVERAGE MACHINES	BFP	WATTS SD–3 OR EQUAL	ASSE 1022 OR ASSE 1024
FILTRATION SYSTEM	BFP	WATTS LF7 OR EQUAL	ASSE 1024

NOTE:
ANY PROPOSED DEVICE MUST BE A TESTABLE DEVICE AT THE POINT OF CONNECTION.

KITCHEN EQUIPMENT SCHEDULE

ITEM NO	QTY	DESCRIPTION	CW	HW	HWR	FW	DRAINAGE DIRECT	DRAINAGE INDIRECT	VENT	GAS
1.1	1	SODA DISPENSER AT DINING ROOM (BY VENDOR)	–	–	–	–	–	¾"	–	–
2.1	1	ICE MAKER, CUBE STYLE AT DINING ROOM	–	–	–	½"	–	¾"	–	–
12	1	GAS FRYER W/ FILTER	–	–	–	–	–	–	–	1"
13	1	GAS CLAMSHELL GRILL, DOUBLE SIDED (BY OWNER)	–	–	–	–	–	–	–	¾"
20	3	HAND SINK W/ FAUCET AND SPLASH GUARDS	½"	½"	–	–	2"	–	1½"	–
21	1	3–COMP SINK W/ PRE–RINSE FAUCET & ADD–ON FAUCET	¾"	¾"	–	–	–	(3)2"	–	–
22	1	2–COMPARTMENT PREP SINK W/ FAUCET	¾"	¾"	–	–	–	(2)2"	–	–
31 32	1	MOP SINK W/ SERVICE FAUCET (BY G.C.) CHEMICAL DISPENSER (BY VENDOR)	¾"	¾"	–	–	3"	–	2"	–
36A	2	COOLER EVAPORATOR COIL	–	–	–	–	–	¾"	–	–
37A	1	FREEZER EVAPORATOR COIL	–	–	–	–	–	¾"	–	–
48	1	POT FILLER FAUCET	½"	–	–	–	–	–	–	–
49	1	WATER FILTRATION SYSTEM	¾"	–	–	–	–	–	–	–
52	1	BAG N' BOX RACK & CARBONATORS (BY VENDOR)	–	–	–	½"	–	¾"	–	–
53	1	ICE MAKER, CUBE STYLE	–	–	–	½"	–	¾"	–	–
54	1	ICE BIN	–	–	–	–	–	¾"	–	–

KITCHEN EQUIPMENT NOTES:

1. IT SHALL BE THE PLUMBING CONTRACTORS RESPONSIBILITY TO MAKE ALL FINAL CONNECTIONS FROM KITCHEN EQUIPMENT TO THE PLUMBING MAINS SHOWN ON PLAN/RISER.
2. THE PLUMBING CONNECTION SCHEDULE RELATES REQUIRED CONNECTIONS TO INDIVIDUAL EQUIPMENT ONLY.
3. PLUMBING CONTRACTOR SHALL REFER TO "KITCHEN EQUIPMENT COMPANY" CUT SHEETS FOR ALL ROUTING OF FINAL CONNECTION TO EQUIPMENT AND EXACT ROUGH–IN LOCATION.
4. PLUMBING CONTRACTOR SHALL MOUNT ALL FLOOR SINKS FLUSH WITH FINISHED FLOOR ELEVATION AND A MINIMUM OF 16" OFF THE FINISH FACE OF THE WALL. AS PER HEALTH DEPARTMENT REQUIREMENTS.
5. INSTALL SECONDARY BFP ASSE 1056 IF CHEMICAL DISPENSER USED WITH MOP SINK.

GREASE INTERCEPTOR CALCULATIONS

Reference No. 106613

Step 1: Flow rate to grease interceptor

Fixture flow rate: (cu in / 231) = gal x 0.75 / 2 min = 2 min flow rate

NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
2 Compartment Sink	2 Compartment Sink	21" x 21" x 14" (2)	1	12,348	20.05 GPM
3 Compartment Sink	3 Compartment Sink	21" x 21" x 14" (3)	1	18,522	30.07 GPM
Floor Drain Emergency	Floor Drain Emergency	N/A	2	N/A	0 GPM
Floor Sink	Floor Sink	N/A	4	N/A	0 GPM
Hand Sink	Hand Sink	10" x 14" x 5"	3	2,100	3.42 GPM
Mop Sink	Mop Sink	24" x 24" x 10"	1	5,760	9.35 GPM
Total					**62.87 GPM**

Step 2: Grease Production

Number of Seats x 4 turns per seat x Grease Production Value x Days between pump-out = Grease output

Number of seats in facility: 62
Grease production value: 0.0455 lbs per serving (Fast Food - Full Prep: High / Flatware)
Days between pump-outs: 90 days

62 x 4 x 0.0455 x 90 = 1015.56 lbs of FOG

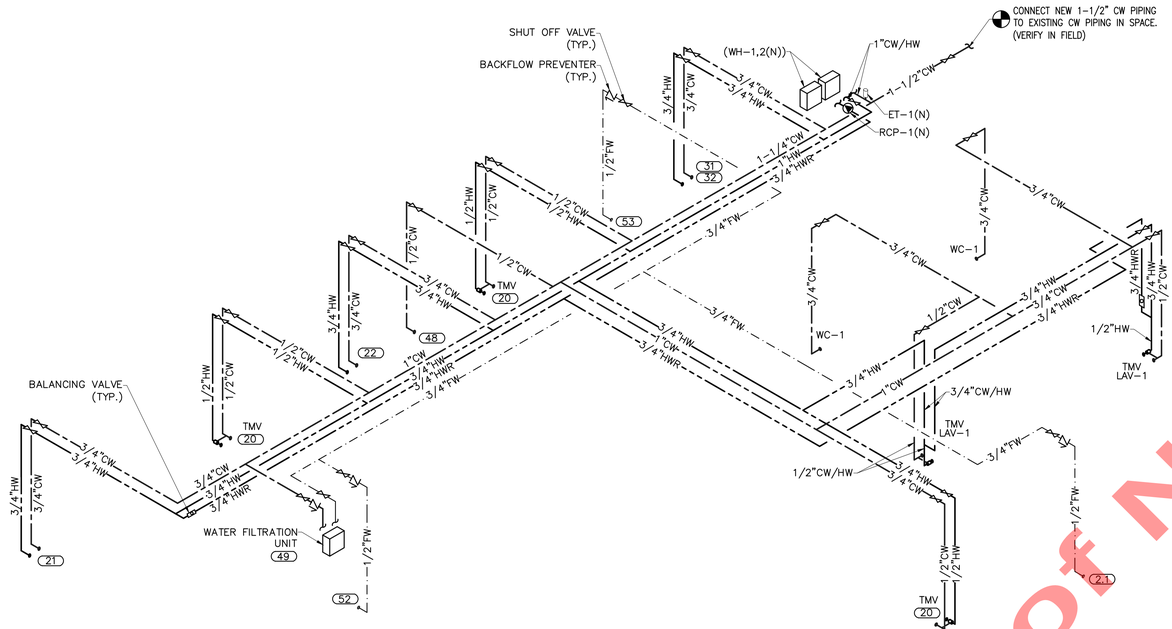
SCHIER MODEL	
GB-250	**Description: GREASE INTERCEPTOR 100 GPM / 150 GPM, 4"** PLAIN/FPT CONNECTIONS **Dimensions: Length: 87", Width: 33", Height: 44"** **Flow Rate/Grease Capacity: 100 GPM / 1895 lbs** **Liquid Capacity: 277 gal**

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2 PLUMBING WATER SUPPLY RISER
NTS

PLUMBING LEGEND

SYMBOL	DISCRIPTION
SAN	SANITARY WASTE (ABOVE FLOOR)
SAN	SANITARY SEWER (UNDER FLOOR)
GW	GREASE WASTE (UNDER FLOOR)
	VENT PIPING
G	GAS PIPING
	COLD WATER
	HOT WATER
	HOT WATER RETURN
	P-TRAP
	PIPE DROP
	PIPE UP
	BALANCING VALVE
	SHUT-OFF VALVE
	GAS PLUG VALVE
	POINT OF NEW CONNECTION
	FILTER WATER
	BACKFLOW PREVENTER
CD	CONDENSATE DRAIN

NEW GAS EQUIPMENT SCHEDULE

ITEM NO.	QTY.	DESCRIPTION	MANUFACTURER	MODEL	BTU/HR.
12	1	GAS FRYER	HENNY PENNY	EEG243.0	225,000
13	1	GAS CLAMSHELL GRILL, DOUBLE SIDED	TAYLOR	LB19	75,000
WH-1,2(N)	2	WATER HEATER	NAVIEN	NPE150S2	240,000
MAU-1(N)	1	MAKEUP AIR UNIT	CAPTIVEAIRE	A1-0.250-182	75,000
				TOTAL LOAD	615,000

GAS PIPING GENERAL NOTES:

1. PROVIDE SHUT-OFF VALVE AN ACCESSIBLE LOCATION. PROVIDE GAS PRESSURE REGULATOR FOR GAS EQUIPMENT IF REQUIRED.
2. CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITION DIFFER THAN SHOWN ON THIS PLAN.

GAS PIPE SIZING PER 2024 INTERNATIONAL FUEL GAS CODE, TABLE 402.4(2)

INLET PRESSURE- LESS THAN 2 PSI
SPECIFIC GRAVITY- 0.6
PRESSURE DROP 0.5" WC

EQUIVALENT LENGTH OF PIPE = 175 FEET

GAS PIPE SIZING

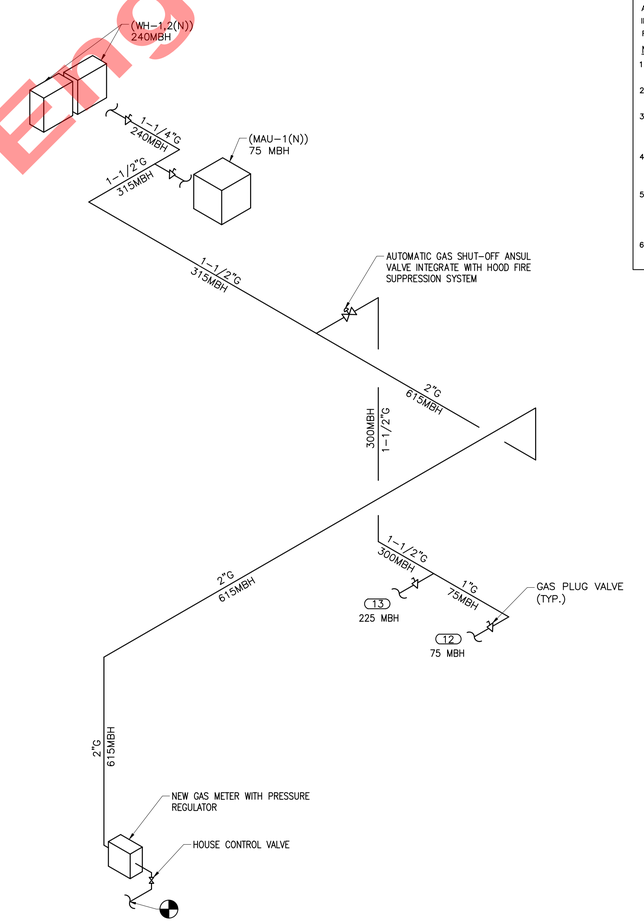
DEVELOPED LENGTH	175 FEET
SIZE	MBH
¾"	77
1"	144
1¼"	296
1½"	443
2"	854
2½"	1,360
3"	2,410

NATURAL GAS PIPING SYSTEM

PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON THE DRAWINGS. PROVIDE EITHER THREADED STEEL OR MALLEABLE IRON PIPE WITH MALLEABLE FITTINGS OR WELDED STEEL. PROVIDE ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS REQUIRED BY 2024 INTERNATIONAL FUEL GAS CODE AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

NOTES:

1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWD FITTINGS.
2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR.
3. VERIFY ALL EQUIPMENT BTUS'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING TO 2024 INTERNATIONAL FUEL GAS CODE, TABLE 402.4(2).
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF EXISTING GAS METER LOCATION, PRESSURE AND CAPACITY. UPGRADE IF REQUIRED.
5. CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN FROM METER TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITIONS DIFFER FROM THOSE SHOWN ON THE PLAN.
6. PROVIDE SHUT-OFF VALVE ON ACCESSIBLE LOCATION. PROVIDE GAS PRESSURE REGULATOR FOR GAS EQUIPMENT IF REQUIRED.



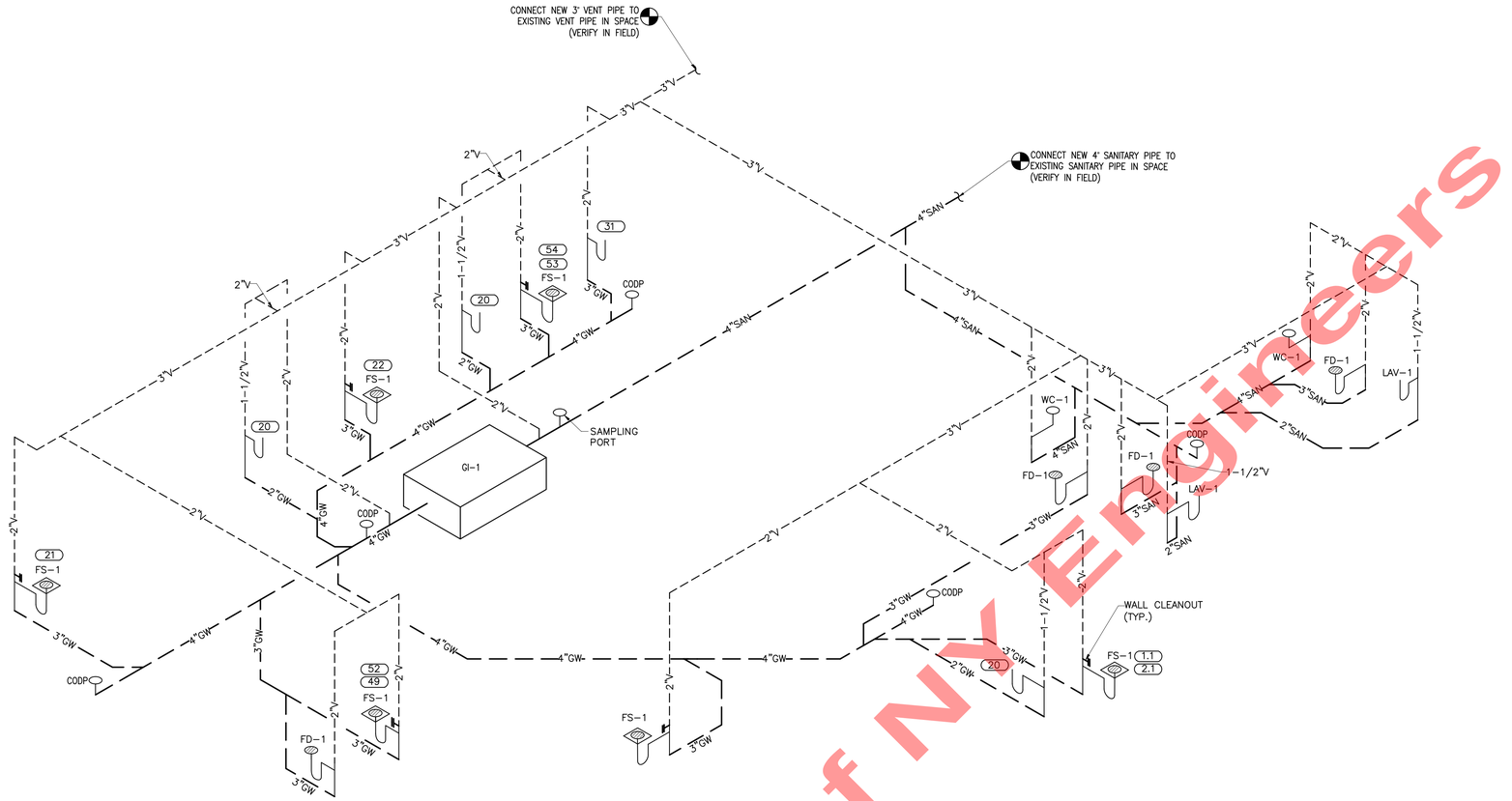
1 PLUMBING GAS SUPPLY RISER
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1 PLUMBING SANITARY & VENT RISER
NTS

PLUMBING LEGEND

SYMBOL	DISCRIPTION
SAN	SANITARY WASTE (ABOVE FLOOR)
SAN	SANITARY SEWER (UNDER FLOOR)
GW	GREASE WASTE (UNDER FLOOR)
	VENT PIPING
	GAS PIPING
	COLD WATER
	HOT WATER
	HOT WATER RETURN
	P-TRAP
	PIPE DROP
	PIPE UP
	BALANCING VALVE
	SHUT-OFF VALVE
	GAS PLUG VALVE
	POINT OF NEW CONNECTION
	FILTER WATER
	BACKFLOW PREVENTER
CD	CONDENSATE DRAIN

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