HVAC ABBREVIATIONS

A	AMPS
AFF	ABOVE FINISHED FLOOR
AMB	AMBIENT
BTU	BRITISH THERMAL UNIT
CFM	CUBIC FEET PER MINUTE
C. O	CLEAN OUT
DIA	DIAMETER
(E)	EXISTING
EAT	ENTERING AIR TEMPERATURE
EDB	ENTERING DRY BULB TEMPERATURE
EF	EXHAUST FAN
RTU	ROOF TOP UNIT
ESP	EXTERNAL STATIC PRESSURE
EWB	ENTERING WET BULB TEMPERATURE
°F	DEGREE FAHRENHEIT
FLA	FULL LOAD AMPS
FPM	FEET PER MINUTE
FT	FOOT OR FEET
HP	HORSEPOWER
kW	KILOWATT
HZ	HERTZ
IN	INCH
LAT	LEAVING AIR TEMPERATURE
LDB	LEAVING DRY BULB TEMPERATURE
LRA	LOCKED ROTOR AMPS
LWB	LEAVING WET BULB TEMPERATURE
MAX	MAXIMUM
MBH	1,000 BTU'S PER HOUR
MCA	MAXIMUM CIRCUIT AMPACITY
MIN	MINIMUM
MOCP	MAXIMUM OVERCURRENT PROTECTION
(N)	NEW
NTS	NOT TO SCALE
OA	OUTSIDE AIR
PH	PHASE
RLA	RUNNING LOAD AMPS
RPM	REVOLUTIONS PER MINUTE
RTU	NEW ROOF TOP UNIT
SA	SUPPLY AIR
SD	SPLITTER DAMPER
SHC	SENSIBLE HEAT CAPACITY
SQ. FT	SQUARE FEET
T	THERMOSTAT
UC	UNDERCUT
AC	AIR CONDITIONING UNIT
ACCU	AIR COOLED CONDENSER UNIT

HVAC GENERAL NOTES

1. ALL DRAWINGS ARE CONCEPTUAL AND SCHEMATIC AND ARE INTENDED FOR USE AS A DESIGN/BUILD GUIDELINE. THE CONTRACTORS ARE RESPONSIBLE FOR VERIFYING ALL FIELD CONDITIONS AND ADJUSTING OR MODIFYING THE SPECIFIC ELEMENTS OF THEIR WORK AS REQUIRED TO MEET THE DESIGN INTENT. THE CONTRACTORS ARE RESPONSIBLE FOR THE FOLLOWING:

   A. COORDINATION WITH OTHER TRADES.

   B. PROVIDING ADDITIONAL DRAWINGS CALCULATIONS AND OTHER DOCUMENTATION REQUIRED FOR THE BUILDING DEPARTMENT. THE MECHANICAL CONTRACTOR SHALL DOCUMENT THE INSTALLATION AND PROVIDE ALL TESTS REQUIRED TO SUBSTANTIATE CODE COMPLIANCE AS REQUIRED BY THE BUILDING DEPARTMENT AND LOCAL INSPECTOR. CONTRACTOR SHALL SUBMIT FINAL AS-BUILT DRAWINGS TO BUILDING DEPARTMENT FOR RECORD AT COMPLETION.

2. MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE, NOT SHOWING EVERY ITEM IN EXACT LOCATION OR DETAIL. MEASUREMENTS AND LOCATIONS MUST BE FIELD VERIFIED AND COORDINATED WITH ARCHITECTURAL, HVAC, FIRE PROTECTION, STRUCTURAL, ELECTRICAL AND OTHER BUILDING DRAWINGS.

3. CONTRACTOR TO INCLUDE IN BID ALL COSTS TO MAKE FIELD COORDINATION AND ADJUSTMENT TO DUCTWORK FOR FIT INTO EXISTING STRUCTURE. CONTRACTOR SHALL VERIFY AND FIELD COORDINATE FINAL LOCATION OF MECHANICAL EQUIPMENT.

4. FURNISH ALL LABOR, MATERIALS, TOOLS, INCIDENTALS AND DETAILS NECESSARY TO PROVIDE A COMPLETE HEATING, VENTILATING, AIR CONDITIONING SYSTEM INCLUDE ANY LABOR AND MATERIAL NOT SPECIFICALLY MENTIONED, BUT NECESSARY TO PROVIDE A COMPLETE AND OPERATING SYSTEM. ALL WORK SHALL BE INSTALLED IN A PROFESSIONAL MANNER AND SHALL MEET ALL THE REQUIREMENTS OF THE STATE BUILDING CODE, CITY BUILDING CODE, SAFETY AND HEALTH CODES, NFPA CODES AND ALL OTHER APPLICABLE CODES AND REQUIREMENTS ALL COSTS FOR SAID REQUIREMENTS SHALL BE INCLUDED IN THIS CONTRACTORS BID PRICE.

5. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE FOLLOWING CODES:

   1 2018 INTERNATIONAL BUILDING CODE
   2018 INTERNATIONAL FIRE CODE
   2018 UNIFORM MECHANICAL CODE
   2018 UNIFORM PLUMBING CODE
   2017 NATIONAL ELECTRICAL CODE
   1 2021 INTERNATIONAL ENERGY CONSERVATION CODE

6. CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND INSPECTIONS AND PERFORM ALL TESTS CALLED FOR OR REQUIRED AS A PART OF HIS WORK. FURNISHED APPROVED CERTIFICATE OF FINAL INSPECTION, AND TURN OVER TO OWNER AT COMPLETION OF PROJECT.

7. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL TRADES, LANDLORD REQUIREMENTS, CEILING HEIGHTS AND EXISTING STRUCTURAL CONDITIONS PRIOR TO FABRICATION OF ANY DUCTWORK OR ORDERING OF ANY EQUIPMENT.

8. ALL INSTALLATION OF THE MECHANICAL EQUIPMENT SHALL COMPLY WITH THE MANUFACTURER'S SPECIFICATION AND CLEARANCE REQUIREMENTS.

9. ALL HVAC WORK SHALL BE IN ACCORDANCE WITH NFPA 90A, 90B, 96, 54 AND NFC 101 LIFE SAFETY CODE.

10. INSTALLATION SHALL COMPLY WITH ALL LOCAL, STATE AND NATIONAL CODES, AND WITH LATEST ASHRAE PUBLICATIONS. WORK SHALL BE NEAT AND WORKMANSHIP SHALL BE ACCEPTABLE TO BUILDING STANDARDS.

11. CONTRACTOR SHALL FURNISH AND INSTALL A COMPLETE TEMPERATURE CONTROL SYSTEM TO INCLUDE: PANELS, MODULES, RELAYS, WIRING, THERMOSTATS, SENSORS, DAMPERS, ACTUATORS AND ALL MISCELLANEOUS ITEMS AS REQUIRED TO FULFILL THE DESIGN INTENT AS INDICATED ON THE PLANS AND IN THE CODED NOTES. THERMOSTATS AND SENSORS SHALL BE LOCATED GENERALLY AS SHOWN BUT THEIR EXACT LOCATION SHALL BE FIELD COORDINATED TO AVOID INTERFERENCE WITH WALL MOUNTED WORK.

12. DURING THE BIDDING PERIOD, EACH CONTRACTOR SHALL VISIT THE SITE TO DETERMINE CONDITIONS AFFECTING THE WORK BIDS SHALL SERVE AS EVIDENCE OF KNOWLEDGE OF EXISTING CONDITIONS AND ANY MODIFICATIONS WHICH ARE REQUIRED TO MEET THE INTENT OF THE DRAWINGS AND SPECIFICATIONS. FAILURE TO VISIT THE SITE DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY IN PERFORMANCE OF WORK REQUIRED CONDITIONS IN EVIDENCE THEREBY SHALL NOT BE JUSTIFICATION FOR ADDITIONAL COMPENSATION.

13. THE EQUIPMENT SHALL BE LOCATED TO ALLOW FOR EASY ACCESS FOR SERVICING, ADJUSTING OR MAINTENANCE AND SPACE FOR REMOVAL OF INTERNAL ASSEMBLIES PROVIDE MINIMUM CLEARANCES FOR ALL EQUIPMENT PER THE MANUFACTURERS RECOMMENDATIONS.

14. PROVIDE ALL CONTROL EQUIPMENT, MOTOR STARTERS, RELAYS, LINE VOLTAGE CONTROLS, TRANSFORMERS, LOW VOLTAGE CONTROLS, AND DEVICES NECESSARY FOR THE COMPLETE OPERATION OF THE HEATING AND AIR CONDITIONING AND VENTILATING SYSTEM.

15. ALL LOW VOLTAGE WIRING AND CONDUIT REQUIRED FOR MECHANICAL EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR.

16. SMOKE DETECTORS WIRED BY DIVISION 16.

17. PROVIDE ALL FANS AND ROOFTOP UNITS WITH RELAYS TO SHUT DOWN WHEN FIRE ALARM IS INITIATED. COORDINATE LOCATION WITH THE ELECTRICAL CONTRACTOR FOR THE FIRE ALARM WIRING.

18. IN THE EVENT OF FAN SHUT DOWN, ALL DUCT MOUNTED DETECTORS SHALL REMAIN IN OPERATION.

19. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH STATE AND LOCAL CODES AND ORDINANCES AND THE NATIONAL ELECTRIC CODE.

20. THE CONTRACTOR SHALL PROVIDE SHOP DRAWINGS PRIOR TO PURCHASING OR INSTALLING EQUIPMENT AND SYSTEMS INDICATED ON THE CONTRACT DOCUMENTS. PRIOR TO THE SUBMITTAL THE CONTRACTOR SHALL VERIFY THAT ADEQUATE SPACE EXIST FOR THE SUBMITTED EQUIPMENT. SHOP DRAWINGS MUST BE REVIEWED BY THE ENGINEER AND ARCHITECT.

21. ALL THE BARE METAL SURFACES SHALL BE PRIMED AND PAINTED TO PREVENT ANY RUST, INCLUDING, BUT NOT LIMITED TO, ANGLE FRAMING, UNIT SUPPORTS, MOUNTING HARDWARE, ETC. ANY PAINTING OF DUCTWORK SHALL BE VERIFIED WITH ARCHITECT.

22. CONTRACTOR TO PROVIDE TENANT WITH AS-BUILT DRAWINGS OF ALL CHANGES OR MODIFICATIONS MADE IN THE FIELD, TO THE ORIGINAL SET OF CONSTRUCTION DOCUMENTS, FOR TURN-OVER TO THE ARCHITECT/ ENGINEER UPON COMPLETION OF THE PROJECT. PROVIDE ALL EQUIPMENT SHOP DRAWINGS, INFORMATION ON CONTROL DEVICES, CONTROL WIRING DIAGRAMS AND OTHER PERTINENT INFORMATION AT COMPLETION OF PROJECT.

23. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT THE MECHANICAL EQUIPMENT COMPONENTS ARE INSTALLED AT LOCATIONS AND ELEVATIONS WHICH MAKE THEM READILY ACCESSIBLE FOR ROUTINE MAINTENANCE WITHOUT REQUIRING ANY EXTRAORDINARY MEASURES.

24. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ADMINISTERING ALL WARRANTIES ON EQUIPMENT WHICH HE INSTALLS. THIS INCLUDES ALL CONDENSERS, REFRIGERANT PIPES, AND OTHER ITEMS FURNISHED BY OTHERS AS WELL AS THOSE FURNISHED BY HIM.

25. FIELD VERIFY THE EXACT LOCATION OF ALL EQUIPMENT WITH ARCHITECT/OWNER PRIOR TO INSTALLATION. INFORM OWNER OF ANY EQUIPMENT ITEMS THAT REQUIRE RELOCATION

26. CONTRACTOR SHALL VERIFY THAT ALL EQUIPMENT. AS SHOWN ON THESE DRAWINGS, WILL NOT CONFLICT WITH ANY DRAINS, VENTS, MECH PIPING OF ANY KIND, ELECTRICAL, ETC.

27. PROVIDE VIBRATION ISOLATION DEVICES AND FLEXIBLE CONNECTIONS TO ALL MOVING MACHINERY.

28. DUCT DIMENSIONS SHOWN ARE INSIDE NET DIMENSIONS, ADD TO SHEET METAL SIZE FOR INSULATION THICKNESS. HOLD DUCTWORK TIGHT TO UNDERSIDE OF STRUCTURE UNLESS OTHERWISE NOTED OR REQUIRED BY FIELD CONDITIONS. IT IS REQUIRED TO COORDINATE EXACT MOUNTING HEIGHT IN FIELD WITH SITE INVESTIGATION. SUPPLY, RETURN, OUTSIDE AIR AND RELIEF AIR DUCTS SHALL BE SHEET METAL AND BE EXTERNALLY INSULATED WITH 1 5" THICK, FOIL FACED FLEXIBLE FIBROUS GLASS BLANKET INSULATION WITH A MIN R-6 VALUE. INSULATION WRAP SHALL BE SEALED WITH FAB AND MASTIC.

29. ALL DUCTWORK SHALL MAINTAIN SYSTEM PRESSURE. THE AIR DISTRIBUTION COMPONENTS SHALL BE SEALED IN ACCORDANCE WITH SMACNA REQUIREMENTS TWO INCH PRESSURE CLASS.

30. DUCT INSULATION CLOSURE SYSTEM SHALL CONSIST OF GLASS FABRIC AND NON MIGRATING MASTIC, SEAL AIR TIGHT.

31. ALL FLEXIBLE DUCTS SHALL BE SUPPORTED EVERY 4'-0" WITH 2" WIDE GALV. STEEL BANDS MINIMUM ONE PER EACH SECTION OF FLEXIBLE DUCT. MAXIMUM LENGTH OF FLEX DUCT SHALL BE 5'-0" LONG AND SHALL MEET INSTALLATION AND MATERIAL REQUIREMENTS OF LOCAL CODES.

32. NO FLEXIBLE DUCTS SHALL PASS THROUGH FIRE WALLS, OR BE CONNECTED TO ANY METAL DUCT WITH-IN 5'-0" FROM EITHER SIDE OF THE FIREWALL.

33. ALL BRANCH TAKE-OFFS SHALL BE PROVIDED WITH MANUAL BALANCING DAMPERS LOCATED ABOVE ACCESSIBLE CEILINGS AS CLOSE TO MAIN TRUNK AS POSSIBLE. WHEN AIR DEVICE IS NOT ACCESSIBLE PROVIDE DAMPER AT AIR DEVICE.

34. CONTRACTOR IS RESPONSIBLE FOR COORDINATING BOX-OUT LOCATIONS FOR ALL DRYWALL MOUNTED AIR DEVICES WITH GENERAL CONTRACTOR AND CEILING FRAMING. CONTRACTOR SHALL COORDINATE ALL DUCT AND DIFFUSER LOCATIONS WITH LIGHTING LAYOUTS AS REQUIRED.

35. ALL DUCTWORK BEHIND RETURN AIR PLENUMS SHALL BE PAINTED FLAT BLACK.

36. ALL SUPPLY DUCT BENDS FROM THE VERTICAL TO HORIZONTAL AND ANGLED TURNS OF DUCTWORK SHALL HAVE TURNING VANES INSTALLED.

37. PROVIDE SMOOTH TRANSITIONS AT EQUIPMENT AND AIR DEVICES TO MATCH CONNECTION SIZES. ALL DUCTWORK SHALL BE SHEET METAL FABRICATED IN ACCORDANCE WITH ASHRAE GUIDE AND SMACNA MANUAL LATEST EDITIONS.

38. THE CONTRACTOR SHALL ENGAGE AN INDEPENDENT AIR BALANCING AGENCY SUBSEQUENT TO THE APPROVAL OF THE OWNERS REPRESENTATIVE. THE T&B AGENCY CAN ONLY ACT AS HIS OWN REPORTING AGENCY IF SUITABLE INSTRUMENTS HEREINAFTER REQUIRED ARE DEMONSTRATED TO BE PART OF HIS NORMAL PROCEDURE TO THE SATISFACTION OF THE OWNERS REPRESENTATIVE. THE T&B AGENCY SHALL BE AABC OR NEBB CERTIFIED. CONTRACTOR SHALL PROVIDE LANDLORD WITH WATER AND AIR BALANCE REPORT.

39. IT SHALL BE THE RESPONSIBILITY OF THIS T&B AGENCY TO PROVIDE THE LOCAL BUILDING DEPARTMENT AND OWNER WITH PROPER TEST & BALANCE DATA ON AABC OR NEBB FORMS.

40. BUILDING AIR SYSTEMS SHALL BE BALANCED PER DATA INCLUDED ON THE DRAWINGS TO ACHIEVE RELATIVE AIR VOLUMES AS INDICATED ON THE DRAWINGS AND SCHEDULED HEREIN REFER TO AIR FLOW DIAGRAM DETAIL.

41. ALL ROOFTOP EQUIPMENT TO BE SET LEVEL AND PLUMB.

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

1. AIR SYSTEMS: CONSTANT AND VARIABLE VOLUME SYSTEMS.
2. MOTORS.
3. HYDRONIC SYSTEM

1.2 QUALITY ASSURANCE

A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION

A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.

D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.

E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.

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

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

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

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

END OF SECTION 230593

HOOD & GREASE EXHAUST DUCT NOTES

1. TYPE I HOODS SHALL BE CONSTRUCTED OF STEEL HAVING A MINIMUM THICKNESS OF 0.048 INCH (1.219 MM) (NO. 18 GAGE) OR STAINLESS STEEL NOT LESS THAN 0.036 INCH [0.914 MM (NO. 20 MSG)] IN THICKNESS. TYPE II HOODS SHALL BE CONSTRUCTED OF STEEL HAVING A MINIMUM THICKNESS OF 0.024 INCH (0.61 MM) (NO. 24 GAGE), HOOD CONSTRUCTED OF COPPER SHEETS WEIGHING NOT LESS THAN 0.17 OUNCES PER SQUARE INCH (7.47KG/M2). JOINTS AND SEAMS SHALL BE SUBSTANTIALLY TIGHT. SOLDER SHALL NOT BE USED EXCEPT FOR SEALING A JOINT OR SEAM.

2. ALL LIGHTS USED IN THE HOODS SHALL BE U.L. LISTED FOR CANOPY HOOD USE AND OF THE INCANDESCENT TYPE AND SHALL BE WIRED TO COME ON THRU A SWITCH LOCATED ON THE HOOD FACE.

3. THE EXHAUST HOODS SHALL HAVE ALL STAINLESS STEEL BAFFLE FILTERS AND SHALL HAVE A FIRE ACTUATED DAMPER IN THE MAKE-UP AIR COLLAR.

4. THE EXHAUST HOODS SHALL HAVE PREPIPED AUTOMATIC U.L. ANSUL FIRE EXTINGUISHING SYSTEMS FOR PROTECTION OF THE EXHAUST PLENUM & DUCT AND COOKING SURFACES. FIRE CONTROL CABINETS SHALL ALSO BE PROVIDED AS SHOWN AND SHALL HAVE MICRO SWITCHES FURNISHED AS REQUIRED FOR EQUIPMENT SHUT OFF. THERE SHALL BE A MANUAL PULL STATION NEAR THE EXIT DOOR AND MINIMUM OF 10'-0" FROM THE HOOD (MUST BE FLUSH MOUNTED, CONDUIT RUN IN THE WALL).

5. THE SUPPLY FAN SWITCHES, 40 VA TRANSFORMERS, SUPPLY & EXHAUST FAN STARTERS, THERMAL OVERLOADS AND MECHANICAL GAS VALVE SHALL BE FURNISHED BY THE HOOD MANUFACTURER, AND SUPPLY FAN SWITCHES SHALL BE MOUNTED ON THE HOOD FACES. THE 40 VA TRANSFORMERS AND FAN STARTERS SHALL BE MOUNTED IN THE FIRE CONTROL CABINETS AND THE MECHANICAL GAS VALVE SHALL BE INSTALLED AS SHOWN ON THE PLUMBING DRAWINGS.

6. ALL EXHAUST COLLARS AND EXHAUST DUCTWORK ARE SIZED TO MAINTAIN BETWEEN 1500 AND 2000 FPM EXHAUST AIR VELOCITY. ALL GREASE EXHAUST DUCTWORK SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH NFPA-96. GREASE EXHAUST DUCTWORK SHALL HAVE ALL SEAMS, JOINTS AND PENETRATIONS CONTINUOUSLY WELDED LIQUID TIGHT.

7. ALL HORIZONTAL RUNS OF GREASE EXHAUST DUCT SHALL SLOPE BACK TOWARD THE HOOD AT A SLOPE OF 1/4" PER FOOT. PROVIDE A RESIDUE TRAP AT THE BASE OF EACH VERTICAL RISER.

8. GREASE DUCT CLEANOUTS AND OPENINGS SHALL COMPLY WITH ALL OF THE FOLLOWING:

   A. GREASE DUCTS SHALL NOT HAVE OPENINGS EXCEPT WHERE REQUIRED FOR THE OPERATION AND MAINTENANCE OF THE SYSTEM.

   B. SECTIONS OF GREASE DUCTS THAT ARE INACCESSIBLE FROM THE HOOD OR DISCHARGE OPENINGS SHALL BE PROVIDED WITH CLEANOUT OPENINGS.

   C. CLEANOUTS AND OPENINGS SHALL BE EQUIPPED WITH TIGHT-FITTING DOORS CONSTRUCTED OF STEEL HAVING A THICKNESS NOT LESS THAN THAT REQUIRED FOR THE DUCT.

   D. CLEANOUT DOORS SHALL BE INSTALLED LIQUID TIGHT.

   E. DOOR ASSEMBLIES INCLUDING ANY FRAMES AND GASKETS SHALL BE APPROVED FOR THE APPLICATION AND SHALL NOT HAVE FASTENERS THAT PENETRATE THE DUCT.

   F. GASKET AND SEALING MATERIALS SHALL BE RATED FOR NOT LESS THAN 1500°F (816°C).

   G. LISTED DOOR ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE ' MANUFACTURERS INSTRUCTIONS.

9. CLEANOUTS SERVING HORIZONTAL SECTIONS OF GREASE DUCTS SHALL:

   A. BE SPACED NOT MORE THAN 20 FEET (6096 MM) APART.

   B. BE LOCATED NOT MORE THAN 10 FEET (3048 MM) FROM CHANGES IN DIRECTION THAT ARE GREATER THAN 45 DEGREES (79 RAD).

   C. BE LOCATED ON THE BOTTOM ONLY WHERE OTHER LOCATIONS ARE NOT AVAILABLE AND SHALL BE PROVIDED WITH INTERNAL DAMMING OF THE OPENING SUCH THAT GREASE WILL FLOW PAST THE OPENING WITHOUT POOLING. BOTTOM CLEANOUTS AND OPENINGS SHALL BE APPROVED FOR THE APPLICATION AND INSTALLED LIQUID-TIGHT.

   D. NOT BE CLOSER THAN 1 INCH (25 4 MM) FROM THE EDGES OF THE DUCT.

   E. HAVE OPENING DIMENSIONS OF NOT LESS THAN 12 INCHES BY 12 INCHES (305 MM BY 305 MM) WHERE SUCH DIMENSIONS PRECLUDE INSTALLATION, THE OPENING SHALL BE NOT LESS THAN 12 INCHES (305 MM) ON ONE SIDE AND SHALL BE LARGE ENOUGH TO PROVIDE ACCESS FOR CLEANING AND MAINTENANCE.

   F. SHALL BE LOCATED AT GREASE RESERVOIRS.

10. THE DISCHARGE OF THE GREASE EXHAUST FANS SHALL BE A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKE OR 3'-0" ABOVE ANY OUTDOOR AIR INTAKE.

11. ALL GREASE EXHAUST DUCTWORK SHALL HAVE STANDARD OR RADIUS ELBOWS.

12. TENENT'S CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WARRANTIES.

13. KITCHEN HOOD TEST AND BALANCE REPORT SHALL BE SUBMITTED TO BUILDING DEPARTMENT PRIOR TO FINAL INSPECTION.

14. UPON ACTIVATION OF ANY FIRE EXTINGUISHING SYSTEM FOR A COOKING OPERATION, ALL SOURCES OF FUEL AND ELECTRIC POWER THAT PRODUCE HEAT TO ALL EQUIPMENT REQUIRING PROTECTION BY THAT SYSTEM SHALL AUTOMATICALLY SHUT OFF. ACTIVATION OF THE AUTOMATIC FIRE EXTINGUISHING SYSTEM MUST IMMEDIATELY SHUT OFF GAS AND ELECTRIC SUPPLY TO ALL APPLIANCES UNDER THE PROTECTED HOOD THE PLUMBING CONTRACTOR SHALL PROVIDE A MASTER SOLENOID VALVE IN GAS LINE TO DISCONNECT ALL GAS APPLIANCES. MANUAL GAS AND ELECTRIC RESETS ARE REQUIRED.

15. ALL AC-1(N) UNIT AND KITCHEN ROOFTOP UNIT SHALL DE-ENERGIZE UPON ACTIVATION OF FIRE/ANSUL HOOD SYSTEM.

16. ALL REMOTE MANUAL PULL STATIONS AND OPERATING DEVICES SHALL BE IDENTIFIED AS THE "HAZARD PROTECTED" PROVIDE PLAQUE AND SIGN AS REQUIRED BY LOCAL JURISDICTION WITH HOOD NUMBER IDENTIFICATION.

17. ONE PLENUM NOZZLE SHALL BE PROVIDE FOR EVERY 10 FEET OF HOOD REFER TO HOOD DRAWINGS FOR EXACT LOCATION.

18. THE HOOD INSTALLING CONTRACTOR SHALL PROVIDE THE LATEST SYSTEM MANUAL AS PROVIDED BY THE MANUFACTURER TO VERIFY THE SYSTEM INSTALLATION EMAIL.

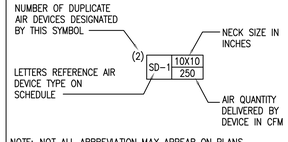
19. CONTACT CAPTIVEAIRE SYSTEMS (STUART SCHEIL) AT PH. (919) 825.3566 x5364. REG36@CAPTIVEAIRE.COM.

NOTE:

EACH HOOD SHALL BEAR THE FOLLOWING APPROVALS:
NSF # 1362
SBCCI # 8469
U.L. CLASSIFICATION # 91C6
NFPA #90A, 90B, 96-101

HVAC SYMBOLS LEGEND

- SUPPLY DUCT RISER
- RETURN DUCT RISER
- EXHAUST DUCT RISER
- SUPPLY DUCT DOWN
- RETURN DUCT DOWN
- EXHAUST DUCT DOWN
- D R — CHANGE OF ELEVATION RISE (R) DROP (D)
- TRANSITION
- ELBOW WITH TURNING VANE
- MANUAL VOLUME DAMPER, SINGLE LEAF
- MANUAL SPLITTER DAMPER
- R S — STANDARD BRANCH, SUPPLY OR RETURN, NO SPLITTER
- RADIUS ELBOW – INSIDE RADIUS MINIMUM ONE HALF DUCT WIDTH
- SQUARE TO ROUND TRANSITION
- SA DUCT, SPIN-IN DAMPER, FLEX DUCT TO AIR DEVICE
- FLEXIBLE DUCT (SINGLE LINE)
- AIR FLOW DIRECTION
- RETURN AIR DEVICE
- SUPPLY AIR DEVICE
- EXHAUST AIR DEVICE
- INDICATES TWO-WAY DIFFUSER; INDICATES BLANKED OFF SIDE
- M — MOTORIZED DAMPER
- T — THERMOSTAT
- S — REMOTE SENSOR/HUMIDISTAT COMBO
- H — HUMIDITY SENSOR
- CO2 — CARBON MONOXIDE SENSOR
- P — PULL STATION FOR HOODS
- RT — REMOTE TEST STATION FOR SMOKE DETECTOR
- SD — SMOKE DETECTOR
- T — MULTIPLE GROUPED THERMOSTATS
- UC — UNDERCUT DOOR 1"
- # — REFERENCE NOTE
- TYPE / NO. — EQUIPMENT TAG
- CD — CONDENSATE DRAIN PIPE



NOTE: NOT ALL ABBREVIATION MAY APPEAR ON PLANS.

FIELD VERIFY ALL CONDITIONS

NOTE!

AS NOTED IN THE SPECIFICATIONS, ALL WIRING LAYOUTS, PIPING LAYOUTS AND DUCT LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONSTRUCTION AND STRUCTURE OF THE BUILDING AND SHALL BE VERIFIED AND COORDINATED IN THE FIELD. EACH TRADE CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THAT HE HAS THOROUGHLY REVIEWED AND COORDINATED ALL LOCATIONS AND ROUTINGS WITH ALL OTHER TRADES PRIOR TO FABRICATION OF CONDUITS, DUCTS, OR PIPING, AND START OF INSTALLATION OF SAME (INCLUDING SPRINKLER PIPING WHEN PRESENT ON JOB). ANY INSTALLATION OR CONSTRUCTION CONFLICTS WHICH OCCUR IN THE FIELD SHALL BE RESOLVED BY THE TRADE CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ARCHITECT AND AT NO EXPENSE TO THE OWNER, ARCHITECT AND/OR GENERAL CONTRACTOR.

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.

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST
STREET SUITE 49674, MIAMI,
FL 33179 PH- 786.788.0295

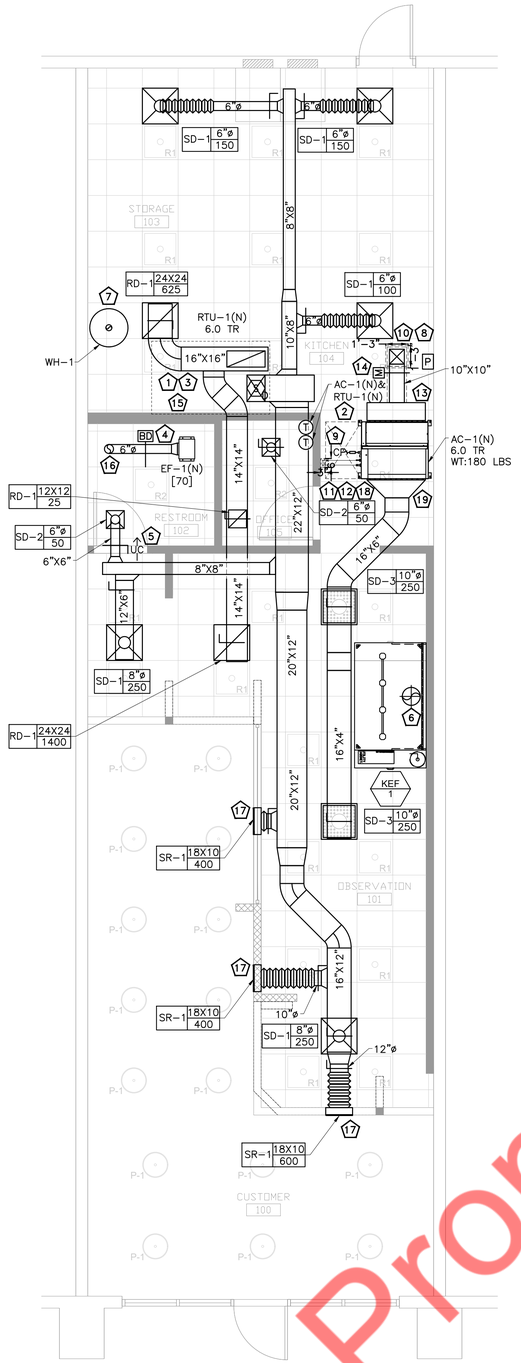
1 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M001
MECHANICAL SPECIFICATION GENERAL NOTES AND LEGEND

CHECKED: NYE DRAWN: NYE



NORTH

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

GENERAL PLAN NOTES

A. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE TO OBSERVE THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES AND PLANS FOR ADDITIONAL.

B. REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.

C. INSTALLATION OF EQUIPMENT SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION AND CLEARANCE REQUIREMENTS.

D. ALL NEW SUPPLY AND RETURN DUCTWORK SHALL BE GALVANIZED STEEL, EXTERNALLY INSULATED WITH TYPE 150, 2" THICK.

E. FIBERGLASS DUCTWRAP. INSTALLED WITH AN "R" VALUE 6.4. SEAL ALL JOINTS AND SEAMS WITH GLASS FABRIC AND MASTIC MEETING UL 181.

F. DUCT SIZES SERVING DIFFUSERS AND GRILLES ARE SAME SIZE AS DIFFUSER OR GRILLE NECK UNLESS NOTED OTHERWISE.

G. ALL RESTROOM EXHAUST DUCTWORK SHALL BE GALVANIZED STEEL. PROVIDED WITH ZERO LEAKAGE BACKDRAFT DAMPER.

H. CONTRACTOR IS RESPONSIBLE FOR COORDINATING DIFFUSERS/REGISTERS BORDER STYLES WITH ARCHITECTURAL CEILING TYPES.

I. PROVIDE VOLUME BALANCING DAMPER AT ALL NINETY-DEGREE DUCT TAKE-OFFS. THIS ALSO APPLIES TO TAKE-OFFS TO DFFUSERS OR REGISTERS LOCATED DIRECTLY UNDER DUCTS.

J. MAXIMUM LENGTH OF FLEXIBLE AIR CONNECTORS SHALL BE 5 FEET OR PER LOCAL CODE.

K. MECHANICAL CONTRACTOR TO FIELD VERIFY WITH STRUCTURE ALL DUCT ROUTING PRIOR TO FABRICATION.

L. CONTRACTOR SHALL COMPLY WITH ALL LANDLORD'S TENANT CRITERIA. COORDINATE AND SCHEDULE ALL WORK WITH LANDLORD'S FIELD REPRESENTATIVE.

M. ALL DUCTWORK SHALL HAVE AN APPROVED CLOSURE SYSTEM BASED ON LOCAL CODE REQUIREMENTS. ALL SEAMS SHALL BE PRESSURE TESTED BASED ON DUCT PRESSURE RATING.

H. PROVIDE MINIMUM R-8 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.

G. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS.

NOTE:
CONTRACTOR TO MEASURE DUCTING AT JOBSITE IMMEDIATELY AFTER JOB AWARD. PROMPTLY PROVIDE DUCT DIMENSION INFORMATION TO CAPTIVEAIRE SYSTEMS FOR FABRICATION. FABRICATION AND DELIVERY TAKES FOUR (4) WEEKS MINIMUM. INCORPORATE INTO CONSTRUCTION SCHEDULE ACCORDINGLY.

(#) FLOOR PLAN KEYED NOTES

1. SUPPLY AND RETURN DUCT UP TO RTU-1 ON ROOF TRANSITION AS REQUIRED. FIELD VERIFY ALL DUCT ROUTING PRIOR TO FABRICATION. PROVIDE FLEX CONNECTION FOR VIBRATION ISOLATION.
2. PROVIDE A TOUCHSCREEN DIGITAL 7-DAY DIGITAL PROGRAMMABLE THERMOSTAT TO THIS LOCATION. THERMOSTATS 48" AFF. COORDINATE EXACT LOCATION WITH TENANT CONSTRUCTION MANAGER. WIRE TO HVAC EQUIPMENT PER MANUFACTURER'S PRINTED INSTRUCTIONS. THE ENTIRE CONTROL SYSTEM SHALL BE PROVIDED COMPLETE IN EVERY RESPECT BY THE MECHANICAL CONTRACTOR.
3. BRANCH TAKE OFFS SHALL NOT BE LOCATED CLOSER THAN 3'-0" FROM ANY ELBOW INCLUDING SUPPLY AIR DROP FROM CURB.
4. INSTALL NEW TOILET EXHAUST FAN AND INTERLOCK WITH LIGHTING. CONTRACTOR SHALL FURNISH AND INSTALL EXHAUST DUCT, RAIN CAP WITH INTEGRAL BIRD SCREEN, BACK DRAFT DAMPER, AND ACCESSORIES AS REQUIRED. MUST MEET LOCAL CODE REQUIREMENTS.
5. PROVIDE 1" UNDERCUT TO ALLOW FOR AIR PASSAGE INTO RESTROOM.
6. 12" EXHAUST DUCT DOWN FROM KEF-1(N ON ROOF. INTERLOCK KEF-1(N) WITH HOOD CONTROLS. CONTRACTOR TO MEASURE DUCTING AT JOBSITE IMMEDIATELY AFTER JOB AWARD. VERIFY ALL CONDITION AND PROMPTLY PROVIDE DUCT DIMENSION INFORMATION TO CAPTIVEAIRE SYSTEMS FOR FABRICATION. FABRICATION AND DELIVERY TAKES FOUR (4) WEEKS MINIMUM. INCORPORATE INTO CONSTRUCTION SCHEDULE ACCORDINGLY.
7. PROVIDE 4"ø CONCENTRIC VENT FOR NEW WATER HEATER.
8. PROVIDE A MANUAL PULL STATION FOR HOOD, PULL STATION SHALL BE LOCATED 10 FEET MINIMUM TO 20 FEET MAXIMUM FROM HOOD, ONE AT OR NEAR EVERY POINT OF EGRESS FROM THE HOOD COOKING AREA. PULL STATION SHALL BE SECURELY MOUNTED NOT LESS THAN 42" (INCHES) TO BOTTOM AFF OR MORE THAN 48" (INCHES) TO TOP OF DEVICE FROM THE FLOOR. PROVIDE SIGNAGE FOR PULL STATION.
9. ROUTE THE REFRIGERANT LINES BETWEEN CONDENSER AND AC-1(N) UNIT. 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.
10. PROVIDE 15"X15" CEILING SLAB OPENING FOR OUTSIDE AIR DUCT AS PER THE DIMENSION MENTIONED IN THE DRAWING.
11. CONNECT CONDENSATE DRAIN FROM AC-1(N) UNIT TO NEAREST PLUMBING DRAIN 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.
12. PROVIDE HORIZONTAL SLOPE IN THE DIRECTION OF DISCHARGE OF NOT LESS THAN 1/8 UNIT VERTICAL IN 12 UNITS HORIZONTAL.
13. CONTRACTOR SHALL PROVIDE FIELD MANUFACTURED FILTER RACK AT THE UNIT INLET. COORDINATE WITH ARCHITECT FOR ACCESS DOOR FOR FILTER.
14. MOTORISED DAMPER TO BE INTERLOCKED WITH AC-1(N).
15. FIRE ALARM CONTRACTOR TO PROVIDE DUCT MOUNTED SMOKE DETECTOR IN THE SUPPLY AIR DUCT AS SHOWN ON PLAN AND REMOTE TEST STATION AND ALL WIRING CONNECTIONS. THE DUCT SMOKE DETECTORS SHALL BE COMPATIBLE WITH THE FIRE ALARM SYSTEM. THE MECHANICAL CONTRACTOR SHALL INSTALL THE SMOKE DETECTORS AND REMOTE TEST STATION. FIRE ALARM CONTRACTOR SHALL CONNECT TO A FIRE ALARM. SYSTEM THE ACTIVATION OF THE DUCT SMOKE DETECTOR SHALL ACTIVATE AN AUBIBLE/VISUAL ALARM AT A CONSTANTLY ATTENDED LOCATION. MECHANICAL AND ELECTRICAL CONTRACTOR SHALL TEST AND VERIFY THE SMOKE DETECTION SYSTEM WORKS PROPERLY AND MEETS ALL LOCAL AND STATE CODES. EXACT LOCATION OF REMOTE STATION SHALL BE FIELDS VERIFIED. REMOTE TEST IS NOT REQUIRED WHERE THE SMOKE DETECTORS CAN BE TESTED FROM THE FIRE ALARM PANEL.
16. 6"ø TOILET EXHAUST DUCT GOING UP TO ROOF. PROVIDE CEILING SLAB OPENING AS PER THE DIMENSION MENTIONED IN THE DRAWING.
17. MOUNT DIFFUSERS 12'-0" A.F.F.
18. PROVIDE AND INSTALL NEW SPLIT SYSTEM. CONDENSER TO BE MOUNTED ON ROOF. FIELD COORDINATE SIZE AND FINAL LOCATION WITH THREE SETS OF STANDARD FILTERS, CONTRACTOR TO REPLACE FILTERS JUST PRIOR TO AIR BALANCE AND ONCE AGAIN AFTER FINAL STORE CLEANING IS COMPLETE.
19. THE AC-1(N) SHALL BE INTERLOCKED WITH THE EXHAUST HOOD SYSTEM AND ENSURE THAT THE AC-1(N) ONLY OPERATES WHEN THE EXHAUST FAN IS WORKING.

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NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

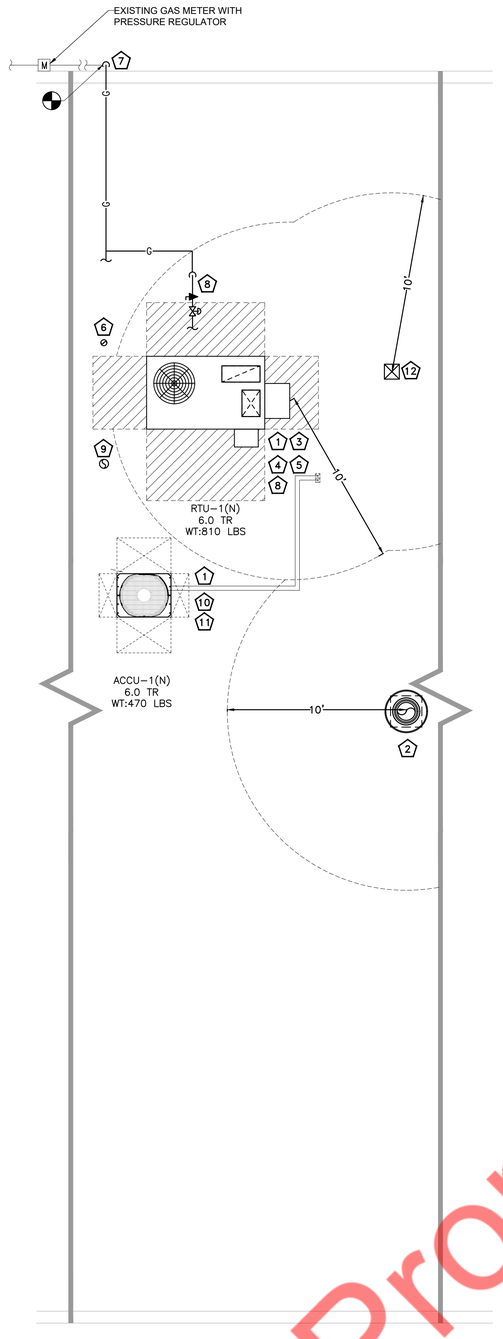
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M101
MECHANICAL FLOOR PLAN

CHECKED: NYE DRAWN: NYE



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

NORTH

GENERAL PLAN NOTES

A. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF THE WORK. PRIOR TO SUBMITTING BID, VISIT THE JOB SITE TO OBSERVE THE EXISTING CONDITIONS OF THE PROJECT. REVIEW GENERAL NOTES. SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT OF ANY CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.

B. INSTALLATION OF EQUIPMENT SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION AND CLEARANCE REQUIREMENTS TO ALLOW FOR INSPECTION, SERVICE, REPAIR OR REPLACEMENT.

C. CONTRACTOR SHALL COMPLY WITH ALL LANDLORD'S TENANT CRITERIA. COORDINATE AND SCHEDULE ALL WORK WITH LANDLORD'S FIELD REPRESENTATIVE.

D. IDENTIFY ALL ROOF MOUNTED EQUIPMENT WITH STORE NAME AND UNIT NUMBER USING PERMANENT WEATHER PROOF 2" HIGH DIE-CUT LETTERS.

E. ALL ROOF OPENINGS SUCH AS VENTS, AND CURBS WILL REQUIRE WATERTIGHT TEMPORARY COVERS UNTIL THE UNIT INSTALLATION IS COMPLETED

ROOF PLAN KEYED NOTES

1. TENANTS CONTRACTOR SHALL SHALL REVIEW ELECTRICAL POWER REQUIREMENTS FOR MECHANICAL EQUIPMENT THAT ARE SCHEDULED ON THE ELECTRICAL DRAWINGS AND VERIFY THAT THEY MATCH PRIOR TO ORDERING EQUIPMENT. DO NOT PURCHASE MOTORS OR ELECTRICAL EQUIPMENT UNTIL POWER CHARACTERISTICS AVAILABLE AT BUILDING HAVE BEEN CONFIRMED BY CONTRACTOR.
2. EXHAUST FAN KEF-1 DISCHARGE SHALL MAINTAIN 10'-0" CLEARANCE FROM ANY OUTSIDE AIR INTAKE AND NOT LESS THAN 10'-0" OF HORIZONTAL CLEARANCE FROM THE OUTLET TO ADJACENT BUILDINGS, PROPORTY LINES AND AIR INTAKES AND 40" ABOVE THE ROOF.
3. COORDINATE ROOF TOP EQUIPMENT LOCATION AND OPENING IN THE ROOF WITH THE STRUCTURAL MEMBERS PRIOR TO CUTTING DECK.
4. MECHANICAL CONTRACTOR TO INSTALL AQUAGUARD AG-3180E MICRO PAN SENSOR (OVERFLOW SWITCH) INSIDE ROOFTOP UNIT DRAIN PAN. ON DOWN-FLOW UNITS AND ALL OTHER COILS THAT DO NOT HAVE A SECONDARY DRAIN AND DO NOT HAVE A MEANS TO INSTALL AN AUXILIARY DRAIN PAN, A WATER-LEVEL MONITORING DEVICE SHALL BE INSTALLED INSIDE THE PRIMARY DRAIN PAN. THIS DEVICE SHALL SHUT OFF THE EQUIPMENT SERVED IN THE EVENT THAT THE PRIMARY DRAIN BECOMES RESTRICTED. EXTERNALLY INSTALLED DEVICES AND DEVICES INSTALLED IN THE DRAIN LINE SHALL NOT BE PERMITTED. AQUAGUARD PH 888-708-6622.
5. CONTRACTOR PROVIDE 1" CONDENSATE DRAIN PIPE FOR NEW ROOF TOP EQUIPMENT. ANY CONDENSATE DRAIN PIPE INSTALLED ON THE ROOF CAN BE PVC SCHEDULE 80, PIPING MATERIAL SHALL BE APPROVED TO NEAREST AVAILABLE EXISTING DRAIN/ ROOF SCUPPER.
6. CONCENTRIC VENT THROUGH ROOF FOR WATER HEATER BELOW. EXHAUST SHALL MAINTAIN 10' CLEARANCE FROM ANY OUTSIDE AIR INTAKE. EXTEND EXHAUST 3' VERTICAL CLEARANCE IF 10' CLEARANCE CAN NOT BE MET TO MEET CODE REQUIREMENTS. ALL ROOF WORK SHALL BE DONE BY LANDLORD'S ROOFING CONTRACTOR AT TENANT'S EXPENSE UNLESS NOTED OTHERWISE. SEE DETAILS FOR ADDITIONAL INFORMATION.
7. PROVIDE 189.1 CFH CAPACITY FROM EXISTING GAS METER WITH NEW 1" GAS PIPING. SEE LANDLORD CIVIL DRAWINGS FOR EXACT LOCATION OF EXISTING GAS METER. ROUTE NEW PIPING. COORDINATE WITH LANDLORD REQUIREMENTS PRIOR TO CONSTRUCTION.
8. GAS PIPING ON ROOF SHALL BE PAINTED WITH RUST RESISTANT PANT. COORDINATE EXACT REQUIREMENTS WITH LANDLORD PRIOR TO BID.
9. EXHAUST DUCT FROM TOILET EXHAUST FAN (EF-1(N)). PROVIDE WITH ROOF CAP. MAINTAIN 10' CLEARANCE FROM ANY FRESH AIR INTAKE. FIELD VERIFY ALL ROUTING AND REQUIREMENTS PRIOR TO BID. SEAL ALL PENETRATIONS WEATHER TIGHT.
10. CONTRACTOR TO INSTALL THE CONDENSING UNIT AS PER MANUFACTURER'S RECOMMENDATIONS. COORDINATE FINAL LOCATION WITH CLIENT AND ARCHITECT.
11. 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 ENERGY CONSERVATION CODE.
12. TERMINATE 12"X12" OA DUCT WITH GOOSENECK AND WIREMESS AT ROOF SURFACE. MAINTAIN MINIMUM 10' DISTANCE FROM ANY EXHAUST AIR INTAKE.

NOTE:
TENANT CONTRACTOR SHALL USE LANDLORD'S ROOFING CONTRACTOR FOR ALL RE-ROOFING, FLASHING, WEATHER PROOFING AND PATCHING PROCEDURES. LOCATION OF ROOF PENETRATIONS SHALL BE REVIEWED AND APPROVED BY LANDLORD IN WRITING.

NOTE:
HOOD EXHAUST FANS AND RESTROOMS EXHAUST FANS SHOULD NOT BE ENGAGED AFTER RESTAURANT OPERATION HOURS, TO AVOID HIGH HUMIDITY PROBLEMS. INTERLOCK THE KITCHEN EXHAUST FAN AND DOAS OPERATION.

NOTE:
MECHANICAL EQUIPMENT, APPLIANCES AND SUPPORTS THAT ARE EXPOSED TO WIND SHALL BE DESIGNED AND INSTALLED TO RESIST THE WIND PRESSURES ON THE EQUIPMENT AND THE SUPPORTS AS DETERMINED IN ACCORDANCE WITH THE BUILDING CODE. ROOF MOUNTED MECHANICAL UNITS AND SUPPORTS SHALL BE SECURED TO THE STRUCTURE. THE USE OF WOOD "SLEEPERS" SHALL NOT BE PERMITTED.

NOTE:
LOCATIONS OF ALL ROOF MOUNTED EQUIPMENT SHOWN ON THIS PLAN ARE DIAGRAMMATIC AND APPROXIMATE. COORDINATE EXACT LOCATIONS WITH ALL TRADES TO MAINTAIN A MINIMUM OF 10'-0" BETWEEN OUTSIDE AIR INTAKES AND EXHAUST OUTLETS, GAS FLUES AND PLUMBING VENTS-THROUGH-ROOF; TO PROVIDE FOR SERVICE CLEARANCE; AND TO FIT WITHIN STRUCTURAL CONSTRAINTS. MAINTAIN CLEARANCES WHEN CONSIDERING ALTERNATIVE MANUFACTURERS OR PRODUCTS.

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REVISIONS

DUCK
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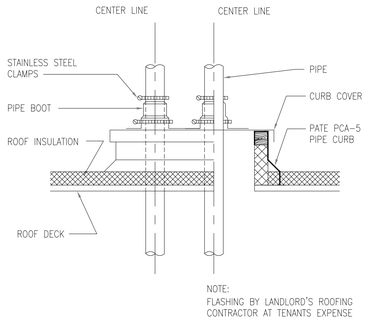
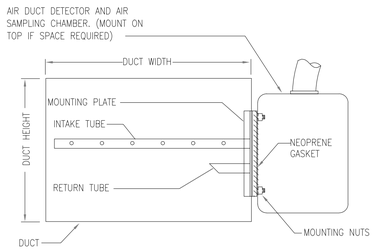
PROJECT NO: 2023.0204
DATE: 03.25.2025

M102
MECHANICAL ROOF PLAN

CHECKED: NYE DRAWN: NYE

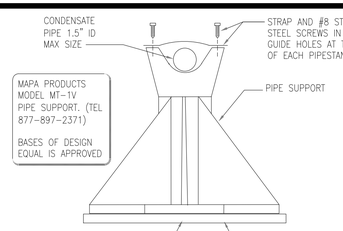


4 REFRIG. LINE PENETRATION DETAIL
NTS



NOTES:
1. SMOKE DETECTOR FURNISHED BY FIRE ALARM CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR, AND MOUNTED BY MECHANICAL CONTRACTOR.
2. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. PROVIDE ACCESS DOOR AT SAMPLING TUBES.
4. INSTALL PER NFPA 90A
5. MOUNT REMOTE INDICATOR/RESET BY THERMOSTATS

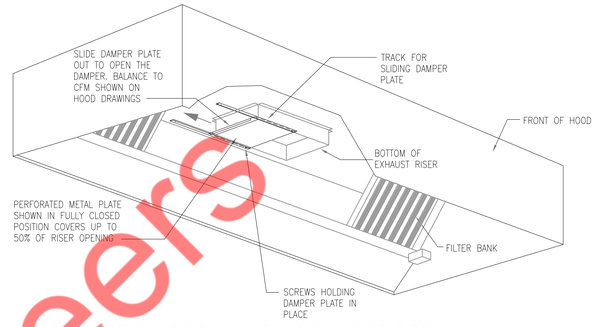
3 SMOKE DETECTOR MOUNTING DETAIL
NTS



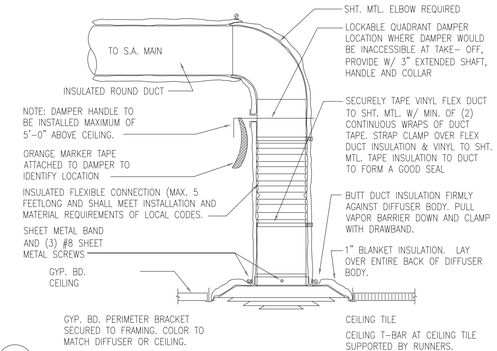
NOTE:
THE MANUFACTURER DOES NOT RECOMMEND FASTENING THE PIPE SUPPORTS TO THE ROOF. SHOULD THE LOCAL BUILDING DEPARTMENT REQUIRE THAT THE PIPE SUPPORTS BE SECURED TO THE ROOF, ANY METHOD OF FASTENING THE SUPPORTS MUST BE COMPATIBLE WITH THE ROOFING MATERIAL SO AS NOT TO VOID THE ROOF WARRANTY. VERIFY A PROPER METHOD OF ATTACHMENT WITH THE ROOFING CONTRACTOR PRIOR TO INSTALLATION.

NOTE:
1. THE MANUFACTURER DOES NOT RECOMMEND FASTENING THE PIPE SUPPORTS TO THE ROOF. SHOULD THE LOCAL BUILDING DEPARTMENT REQUIRE THAT THE PIPE SUPPORTS BE SECURED TO THE ROOF, ANY METHOD OF FASTENING THE SUPPORTS MUST BE COMPATIBLE WITH THE ROOFING MATERIAL SO AS NOT TO VOID THE ROOF WARRANTY. VERIFY A PROPER METHOD OF ATTACHMENT WITH THE ROOFING CONTRACTOR PRIOR TO INSTALLATION.
2. IF A SUPPORT PAD IS TO BE UTILIZED PLACE PAD IN THE DESIGNATED SUPPORT AREA. IF SPECIFIED, ADHERE SUPPORT PAD TO ROOF MEMBRANE AS DIRECTED BY THE ROOFING MANUFACTURER.
3. PLACE SUPPORT AS APPROPRIATE ON EITHER THE ROOF MEMBRANE OR CENTERED ON THE SUPPORT PAD. WHERE SPECIFIED ADHERE SUPPORT TO PAD. MAPA PRODUCTS RECOMMENDS E-6000 ADHESIVE.

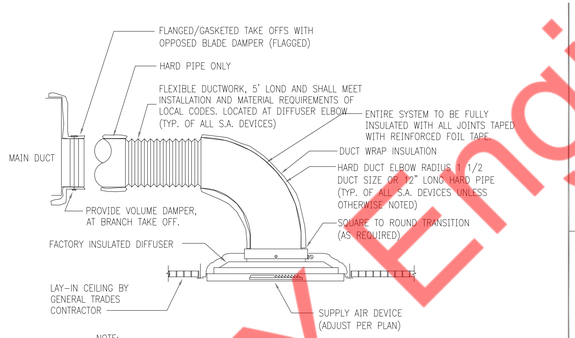
2 CONDENSATE PIPE SUPPORT DETAIL
NTS



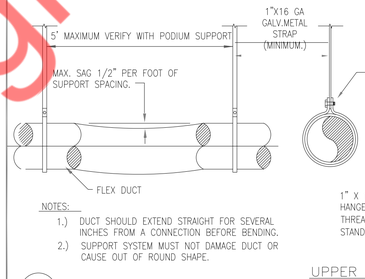
1 HOOD DAMPER PLATE BALANCING DAMPER DETAIL
NTS



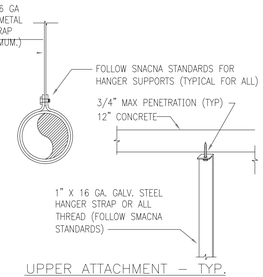
6 CONNECTION DIFFUSER DETAIL
NTS



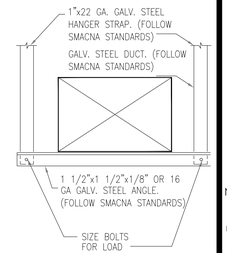
NOTE:
INSTALLATION SIMILAR FOR GYP. BOARD CEILING



NOTES:
1.) DUCT SHOULD EXTEND STRAIGHT FOR SEVERAL INCHES FROM A CONNECTION BEFORE BENDING.
2.) SUPPORT SYSTEM MUST NOT DAMAGE DUCT OR CAUSE OUT OF ROUND SHAPE.

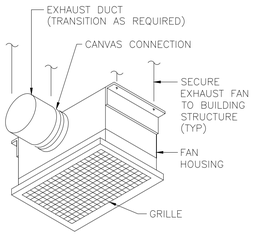


UPPER ATTACHMENT – TYP.

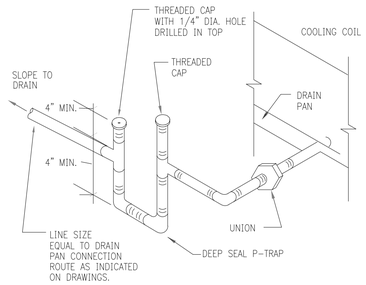


TRAPEZE HANGER LOWER ATTACHMENT – TYP.

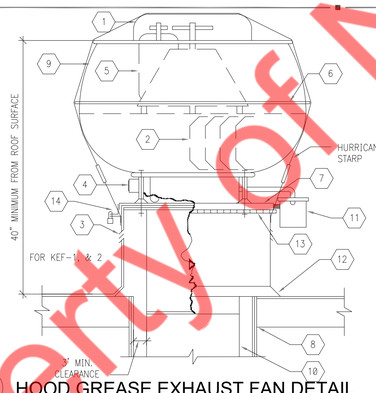
5 DUCT HANGING DETAIL
NTS



10 CEILING EXHAUST FAN DETAIL
NTS

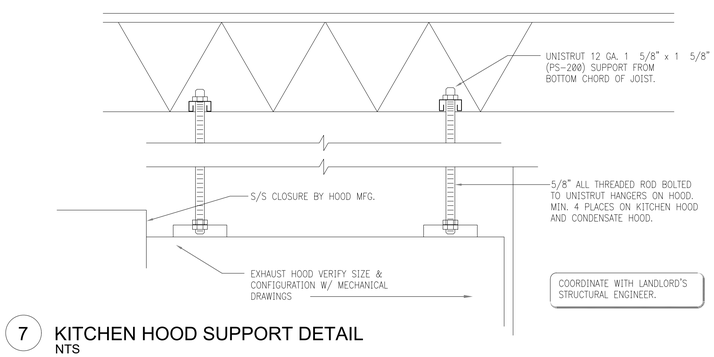


9 CONDENSATE P-TRAP DETAIL
NTS

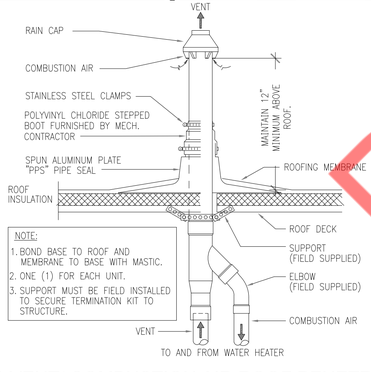


1. MOTOR DOME – ALUMINUM, REMOVABLE
2. FAN WHEEL – ALUMINUM, CENTRIFUGAL. BACKWARD INCLINED BLADES.
3. CURB – EXTENDED, STEEL, WELDED BY FAN MANUF.
4. ELECTRICAL CONDUIT STUB.
5. MOTOR – BELT DRIVE, ADJUSTABLE PULLEY, OUT OF AIR STREAM
6. BIRDSCREEN – ALUMINUM
7. FAN BASE – HEAVY GAUGE STEEL, ONE PIECE CONSTRUCTION, HINGED
8. ROOF OPENING – VERIFY WITH GENERAL CONTRACTOR AND MFR'S SUBMITTALS
9. WIND BAND – SPUN ALUMINUM, UPBLAST TYPE
10. EXHAUST DUCT – HEAVY GAUGE STEEL WITH FIRE PROOFING, INSULATION EQUAL TO FIRE MASTER
11. GREASE TROUGH – SECURE TO BASE
12. ROOF CURB, ADJUST HEIGHT TO MAINTAIN 40" FROM ROOF SURFACE
13. HINGED CURB FOR CLEANING, FLEXIBLE ELECTRICAL CONDUIT FOR EXTENSION AND CHAIN LOCK FOR OPEN POSITION.
14. PROVIDE LOREN COOK HINGED BASE KIT OR EQUAL. THE HINGED BASE KIT IS A FIELD INSTALLED

8 HOOD GREASE EXHAUST FAN DETAIL
NTS

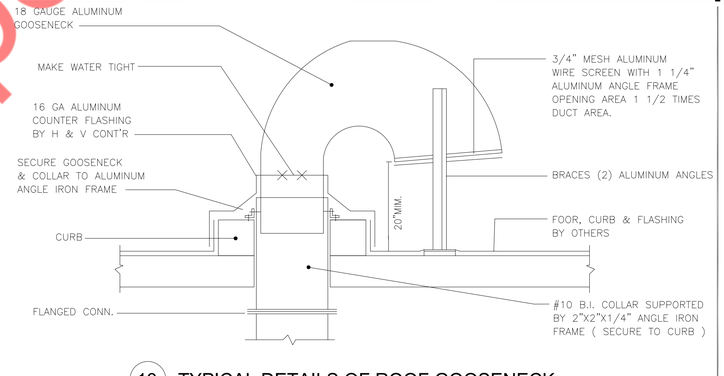


7 KITCHEN HOOD SUPPORT DETAIL
NTS

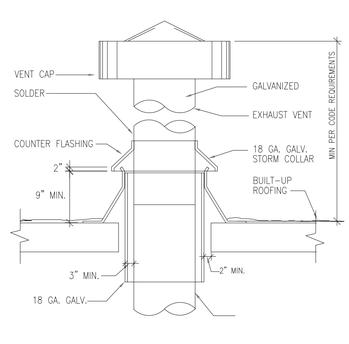


NOTE:
1. BOND BASE TO ROOF AND MEMBRANE TO BASE WITH MASTIC.
2. ONE (1) FOR EACH UNIT.
3. SUPPORT MUST BE FIELD INSTALLED TO SECURE TERMINATION KIT TO STRUCTURE.

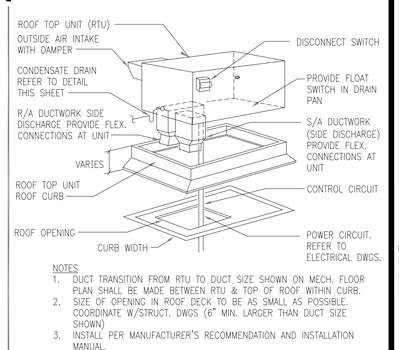
14 CONCENTRIC VENT/ COMBUSTION AIR ROOF PENETRATION DETAIL
NTS



13 TYPICAL DETAILS OF ROOF GOOSENECK
NTS



12 EXHAUST VENT THRU ROOF
NTS



NOTES
1. DUCT TRANSITION FROM RTU TO DUCT SIZE SHOWN ON MECH. FLOOR PLAN SHALL BE MADE BETWEEN RTU & TOP OF ROOF WITHIN CURB.
2. SIZE OF OPENING IN ROOF DECK TO BE AS SMALL AS POSSIBLE. COORDINATE W/STRUCT. DWGS (6" MIN. LARGER THAN DUCT SIZE SHOWN)
3. INSTALL PER MANUFACTURER'S RECOMMENDATION AND INSTALLATION MANUAL.

11 ROOF TOP UNIT MOUNTING DETAIL
NTS

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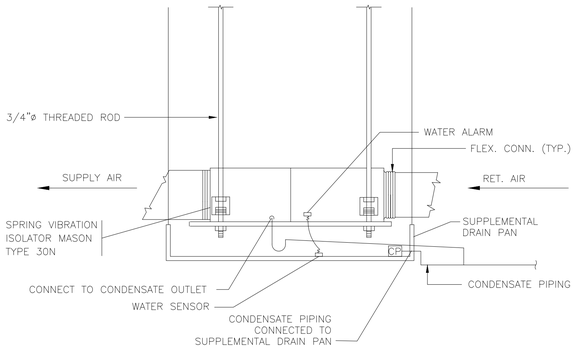
3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

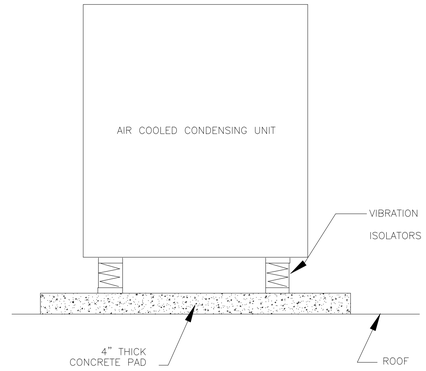
PROJECT NO: 2023.0204
DATE: 03.25.2025

M201
MECHANICAL DETAILS

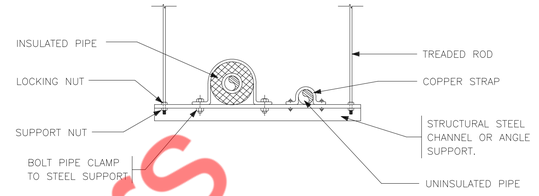
CHECKED: NYE DRAWN: NYE



3 AC UNIT INSTALLATION DETAIL
NTS



2 CONDENSING UNIT MOUNTING DETAILS
NTS



TYPICAL TRAPEZE HANGER SUPPORT

PIPE HANGER ROD AND SPACING SCHEDULE

NOMINAL PIPE OR TUBE SIZE – INCHES	5/8	3/4	7/8	1	1 1/2	2	2 1/2	–	–	–	–	–
HANGER ROD SIZES INCHES	3/8	3/8	3/8	3/8	3/8	3/8	3/8	–	–	–	–	–
MAX. SPACING BETWEEN PIPE SUPPORTS – FEET	–	6	–	7	9	10	11	–	–	–	–	–
MAX. SPACING BETWEEN CU. TUBE SUPPORTS–FT.	6	6	6	6	8	9	10	–	–	–	–	–

NOTES : TRAPEZE HANGER SPACING SHALL BE BASED ON SPACING OF SMALLEST PIPE ON TRAPEZE. TRAPEZE SHALL BE DESIGNED WITH A FACTOR OF SAFETY OF 5 FOR CENTER OF SPAN CONCENTRATED LOAD.

1 METHOD OF HANGING REFRIGERANT PIPING
NTS

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH- 786.788.0295

⚠ 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M202
MECHANICAL DETAILS

CHECKED: NYE DRAWN: NYE

OUTSIDE AIR CALCULATIONS

ROOM NUMBER & NAME	AREA SQ. FT.	NO. OF PEOPLE	REQ'D OA CFM/PERSON	REQ'D OA CFM/SQ FT	ZONE EFFECTIVENESS	TOTAL OA	TOTAL OA
CUSTOMER	450	15	7.5	0.18	0.8	194	250
POS	60	1	7.5	0.12	0.8	15	25
KITCHEN	283	4	7.5	0.12	0.8	64	700
OFFICE	36	1	5	0.06	0.8	7	25
RESTROOM	48	–	–	–	0.8	–	–
BACK OF HOUSE	420	3	–	0.06	0.8	25	50
TOTALS	**REQUIRED OUTSIDE AIR**					**305**	**1050**
	PROVIDE OUTSIDE AIR						

NOTES:
1. ESTIMATED MAXIMUM OCCUPANCY AND REQUIRED OUTSIDE AIR BASED ON THE 2018 LAS VEGAS UNIFORM MECHANICAL CODE.

FAN SCHEDULE

KEY: CENT – CENTRIFUGAL ; PROP. – PROPELLER; F.C.– FORWARD CURVE; B.I. – BACKWARD INCLINED; A.F. – AIR FOIL

TAG	MODEL	TYPE	LOCATION	CFM	ESP	TOTAL S.P.(IN H_2O)	RPM	HP	BHP	COOLING COIL TOTAL CAPACITY MBH	COOLING COIL SENSIBLE CAPACITY MBH	DRIVE: ADJUST V-BELT	DRIVE: DIRECT	DAMPER: GRAVITY	DAMPER: MOTOR OPERATED	ELECTRICAL DATA: FLA	ELECTRICAL DATA: VOLTS / PHASE	WEIGHT (LBS) W/CURB	REMARKS	DESCRIPTION
EF-1(N)	SP-A125	CENT.	CEILING	70	0.3	0.3	1100	–	0.01	–	–	–	X	X	–	–	115 / 1	17	E	RESTROOM FAN
KEF-1(N)	CAPTIVEAIRE DU50HFA	CENT.	ROOF	900	0.9	0.9	1400	0.5	0.28	–	–	–	–	–	–	–	115 / 1	105	A–D	HOOD–1 EXHAUST FAN

NOTES:
A. GREASE EXHAUST FAN AND ACCESSORIES TO BE FURNISHED BY REP THRU CAPTIVEAIRE, INSTALLED BY MECHANICAL CONTRACTOR. PROVIDE WITH VENTED ROOF CURB, HINGED BASE CHAIN AND HASP KIT AND BUILT–IN GREASE TROUGH DRAIN FITTING. PROVIDE DISCONNECT SWITCH.
B. PROVIDE WITH HOOD ON/OFF TOGGLE SWITCH. INTERLOCK TO CONTROL PANEL.
C. PROVIDE BACKDRAFT DAMPER AND STAINLESS STEEL BIRDSCREEN.
D. PROVIDE WITH FACTORY CURB, SEE HOOD DRAWING FOR MORE INFORMATION.
E. PROVIDE FAN WITH BACKDRAFT DAMPER, STANDARD PLUG DISCONNECT, WHITE GALVANIZED STEEL GRILLE.

ROOF TOP UNIT SCHEDULE

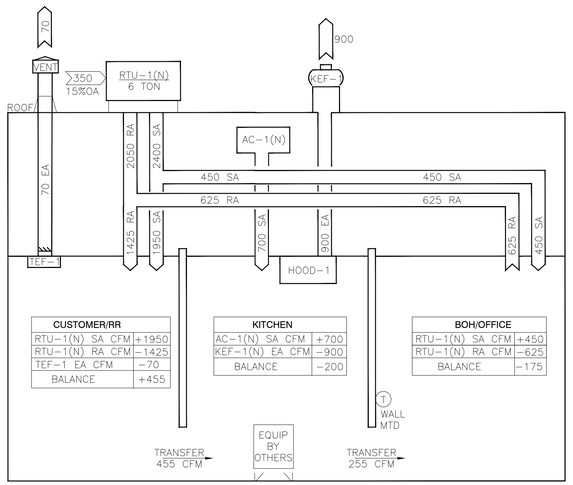
UNIT TAG	RTU–1(N)
MANUFACTURER	CHAMPION OR EQUIVALENT
MODEL NUMBER	ZXGA7E2C3AA1A111A2
NOMINAL TONNAGE	6.0
ESP	1.0
EER	11.0
INDOOR FAN CFM	2400
MINIMUM OUTDOOR AIR CFM	350
PECENT OF OA	15
COOLING CAPACITY	
OUTSIDE AIR TEMPERATURE °F	108
ENTERING AIR TEMP. DB. / WB. °F	80 / 67
TOTAL COOLING CAPACITY (M.B.H)	70.0
SENSIBLE COOLING CAPACITY (M.B.H)	53.0
HEATING CAPACITY	
INPUT (M.B.H)	114.0
OUTPUT (M.B.H)	91.0
HEATING EFFICIENCY	80%
ELECTRIC	
VOLTS / PHASE /HERTZ	208 / 3 / 60
MINIMUM CIRCUIT AMPLICITY (A)	33.4
MAXIMUM OVERCURRENT PROTECTION (A)	50
BHP	2.0
IEER	14.8
WIEGHT (LBS)	810

INCLUDED SYSTEM OPTIONS FOR NEW RTU
A. PROVIDE FULL PERIMETER 14" HIGH ROOF CURB – FLD.
B. PROVIDE DUCT MOUNTED SMOKE DETECTOR ON SUPPLY SIDE.
C. PROVIDE 2" MERV8 AND MERV13 FILTERS – FACTORY.
D. PROVIDE HINGED PANELS FOR FILTER ACCESS, FAN MOTOR ACCESS, COMPRESSOR ACCESS AND CONTROL COMPARTMENT ACCESS – FACTORY.
E. CONTRACTOR TO PROVIDE 7–DAY PROGRAMMABLE THERMOSTAT WITH HUMIDITY CONTROL.
F. HAIL GUARD –FLD
G. PROVIDE WITH TUBE AND FIN COIL SYSTEM FACTORY. FACTORY.
H. PROVIDE WITH DRAIN PAN OVERFLOW SWITCH FACTORY.
I. PROVIDE WITH STANDARD CAP & PHASE MONITOR FACTORY
J. PROVIDE WITH MULTI STAGE AIR VOLUME – FACTORY.
K. PROVIDE WITH GFCI FLD WIRED FACTORY.
L. PROVIDE WITH DUAL ENTHALPY ECONOMIZER FACTORY
M. PROVIDE RTU WITH MODULATING HOT GAS REHEAT

RTU NOTES
1. INSTALL AS PER MANUFACTURER'S SPECIFICATIONS & MAINTAIN ALL SERVICE CLEARANCES
2. PROVIDE CONDENSATE DRAIN "P" TRAP MINIMUM 4" DEEP, OR TWICE THE TOTAL STATIC PRESSURE, WHICHEVER IS GREATER.
3. COORDINATE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNIT.
4. COMPRESSOR SHALL HAVE A MINIMUM 5–YEAR WARRANTY ALL OTHER EQUIPMENT SHALL HAVE MINIMUM 1 YEAR WARRANTY.
5. AIR CONDITIONING UNITS ARE BASED ON ARI STANDARD CONDITIONS OF 81F DB, 67°F WB, INDOOR ENTERING AIR TEMPERATURE AND 90°F DB ENTERING AIR FOR OUTDOOR UNIT.
6. MUST MEET THE EER'S MINIMUM EFFICIENCY CODE REQUIREMENTS.
7. ALTERNATE MANUFACTURES AND MODELS WILL BE REVIEW. THERE MAY BE ARCHITECTURAL, STRUCTURAL AND ELECTRICAL CHANGES RESULTING FROM THE ALTERNATES. THE COST OF IMPLEMENTING AND ENGINEERING THESE CHANGES SHALL BE BORNE BY THE MECHANICAL SUBCONTRACTOR.

CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKERS, DISCONNECT, ETC. PRIOR TO ORDERING AND BID.

BUILDING BALANCE DIAGRAM



BUILDING PRESSURE	
CUSTOMER ROOM	+455
KITCHEN	–200
BOH/OFFICE	–175
BALANCE	+80

NOTES:
TYPE I HOODS SHALL BE DESIGNED AND INSTALLED TO AUTOMATICALLY ACTIVATE THE EXHAUST FAN WHENEVER COOKING OPERATIONS OCCUR. THE ACTIVATION OF THE EXHAUST FAN SHALL OCCUR THROUGH AN INTERLOCK WITH THE COOKING APPLIANCES, BY MEANS OF HEAT SENSORS OR BY MEANS OF OTHER APPROVED METHODS.

THERMOSTAT SCHEDULE

MARK	SERVICE LOCATION	OCCUPIED: COOLING	OCCUPIED: HEATING	UNOCCUPIED: COOLING	UNOCCUPIED: HEATING	REMARKS
RTU–1(N)	CUSTOMER	78	68	78	60	

NOTES:
1. CONTRACTOR SHALL COORDINATE EXACT OPERATIONAL TIMES WITH OWNER/MANAGER PRIOR TO PROGRAMMING.

BUILDING AIR BALANCE SCHEDULE

MARK	OUTSIDE AIR	EXHAUST AIR
KEF–1(N)	–	–900 CFM
RTU–1(N)	350 CFM	–
EF–1(N)	–	–70 CFM
AC–1(N)	700 CFM	–
TOTAL	1100 CFM	–970 CFM
BUILDING POSITIVE AIR BALANCE		80 CFM

AIR TERMINAL SCHEDULE

TAG	MANUFACTURE	MODEL	TYPE	COLOR	NECK SIZE	NOM FACE SIZE	FRAME SIZE	NC MAX
SD–1 CFM	TITUS	TMS–AA	SQUARE DIFFUSER	__	SEE PLAN	24"X24"	LAY–IN/SURFACE	<30
SD–2 CFM	TITUS	TMS–AA	SQUARE DIFFUSER	__	SEE PLAN	12"X12"	LAY–IN/SURFACE	<30
SD–3 CFM	TITUS	PAS–AA	PERFORATED DIFFUSER	__	SEE PLAN	24"X24"	LAY–IN/SURFACE	<30
RD–1 CFM	TITUS	50–F	EGGCRATE	__	SEE PLAN	SEE PLAN	LAY–IN	<30
SR–1 CFM	TITUS	300FL	SUPPLY AIR GRILLE	__	SEE PLAN	18"X10"	SURFACE	<30

NOTES:
1. PROVIDE WITH OPPOSED BLADE DAMPER AT AIR DEVICE.
2. MAX NC LEVEL 30.
3. PROVIDE SQUARE TO ROUND NECK ADAPTOR.
4. SEE ARCHITECTURAL DRAWINGS FOR COLOR AND FINISH.
5. PROVIDE 4–WAY AIR THROW PATTERN UNLESS OTHERWISE NOTED OR INDICATED.
6. PROVIDE INSULATED BACK ON ALL AIR DEVICES MIN. R6 MIN.
7. DUCT BEHIND RETURN AIR DEVICES SHALL BE BLACK.

CONTROL SEQUENCE OF OPERATIONS: RTU

GAS HEATING/ELECTRIC COOLING RTU SEQUENCE OF OPERATION

DAY CYCLE COOLING

1. SUPPLY AIR FAN SHALL RUN CONTINUOUSLY.
2. OUTSIDE AIR DAMPER SHALL BE IN MINIMUM POSITION.
3. THERMOSTAT SHALL CYCLE COMPRESSOR(S) TO MAINTAIN ROOM SET TEMPERATURE.

DAY CYCLE HEATING

1. SUPPLY AIR FAN SHALL RUN CONTINUOUSLY.
2. OUTSIDE AIR DAMPER SHALL BE IN MINIMUM POSITION.
3. THERMOSTAT SHALL CYCLE GAS HEATER TO ACHIEVE ROOM SET TEMPERATURE.

ECONOMIZER

1. SUPPLY AIR FAN SHALL RUN CONTINUOUSLY.
2. OUTSIDE AIR DAMPER SHALL MODULATE FROM MINIMUM TO 100% OUTSIDE AIR TO MAINTAIN ROOM SET TEMPERATURE.

MORNING WARM–UP

1. SUPPLY AIR FAN SHALL RUN CONTINUOUSLY.
2. OUTSIDE AIR DAMPER SHALL BE IN CLOSED POSITION.
3. WHEN SET TEMPERATURE IS REACHED COOLING OR HEATING CYCLE SHALL COMMENCE.

NIGHT SETBACK

1. OUTSIDE AIR DAMPER SHALL BE IN CLOSED POSITION.
2. THERMOSTAT SHALL CYCLE EITHER COOLING OR HEATING AND SUPPLY AIR FAN TO MAINTAIN ROOM SET TEMPERATURE.

SMOKE DETECTOR

1. WHEN SMOKE DETECTOR IS ACTIVATED SUPPLY AIR FAN SHALL SHUTDOWN.
2. SUPPLY AIR FAN SHALL BE MANUALLY RESET.

GREASE HOOD SYSTEM CALCULATIONS

1. TYPE : CANOPY TYPE I, STAINLESS STEEL 22 GAUGE.
2. COOKING EQUIPMENT; (1EA) DONUT MAKER
3. HOOD SIZE: HOOD–1 6'–0" x 4'–0"
4. MIN. REQ'D CAPACITY CFM (1) U.L. LISTED HOOD @ 900 CFM EACH
5. PROPOSED FANS; (1) EXHAUST FAN & (1) AC–1(N) UNIT KEF–1(N) (900 CFM TOTAL) AC–1(N) (500 CFM TOTAL)
6. EXHAUST DUCT SIZE KEF–1=12"ø
7. EXHAUST VELOCITY @ EXHAUST DUCT KEF–1=900/(π(10"/2)^2)/144)=1650 FPM
8. EXHAUST FAN AND DOAS UNIT SHALL BE ELECTRICALLY INTERLOCKED AS FOLLOW: EXHAUST FAN KEF–1(N) — OUTSIDE SPLIT AIR UNIT AC–1(N)

REFER TO CAPTIVEAIRE DRAWING FOR HOOD AND EXHAUST INFORMATION.

HEAT PUMP CONDENSING UNITS — MAKE: TRANE MITSUBISHI

UNIT TAG	NUMBER OF MODULES	LOCATION	INDOOR UNITS SERVED	CAP.TR	COOLING MBH	HEATING MBH	COMPRESSOR TYPE	UNIT DIMENSIONS IN.(HXWXD)	WEIGHT (LBS)	PIPING DIMENSION: LIQUID-HI PRESSURE	PIPING DIMENSION: GAS LOW-PRESSURE	ELECTRICAL: (V/Hz/Ph)	ELECTRICAL: MCA (AMPS)	ELECTRICAL: MOP (AMPS)	SOUND LEVEL (Dba)	EER	IEER	COP	MODEL NO.
ACCU-1(N)	1	SEE PLANS	AC-1(N)	6	72	80	INVERTER SCROLL HERMATIC	72X36X30	470	3/8"	7/8"	208/60/3	29	45	55	10.9	21.6	4.03	TUHYP0723AN40AN

NOTES:
1. UNIT SHALL HAVE TEN YEAR EXTENDED WARRANTY FOR COMPRESSORS/PARTS.
2. PROVIDE LOW AMBIENT CONTROL FOR CONDENSING UNIT OPERATION DOWN TO -13°F.
3. PROVIDE COMPRESSOR CYCLE PROTECTOR.
4. PROVIDE STEEL RAILS AND VIBRATION ISOLATORS FOR MOUNTING THE UNIT.
5. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEED THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
6. AIR CONDITIONER UNIT SHALL NOT PRODUCE NOISE LEVELS IN EXCESS OF 42 dB FOR A SINGLE AIR CIRCULATING DEVICE AND 45 DECIBELS FOR THE CUMULATIVE NOISE LEVEL OF MULTIPLE AIR CIRCULATING DEVICES AS MEASURED 3 FEET FROM THE NOISE SOURCE AT AN OPEN DOOR OR WINDOW OF A NEARBY RESIDENCE.

AIR CONDITIONER SCHEDULES — MAKE: TRANE MITSUBISHI

UNIT TAG	LOCATION	UNIT TYPE	CAP. (TON)	COOLING MBH	HEATING MBH	TOTAL CFM (MAX.)	OA CFM	MAX. ESP. (IN. WG)	MAX. SOUND	ELECTRICAL DATA: VOLT/PH/HZ	ELECTRICAL DATA: MCA	ELECTRICAL DATA: MOP	DIMENTIONS (HXWXD) (IN.)	PIPE SIZE: LIQ.	PIPE SIZE: SUCTION	PIPE SIZE: DRAIN (ID)	WEIGHT (LBS.)	MODEL NO.	REMARKS
AC-1(N)	SEE PLANS	DUCTED FCU FOR 100% OA APPLICATIOONS	6.0	72.0	43.0	700	700	0.6	34	208/1/60	4.80	15	18X49X44	3/8"	3/4"	1-1/4"	180	TPEFYP072OA140A	-

NOTES:
1. SUPPLY AIR CFM BASED ON HIGH SPEED.
2. REFRIGERANT R410A SHALL BE PROVIDED.
3. PROVIDE MOUNTING BRACKETS AND ALL ASSOCIATED ACCESSORIES.
4. ALL REFRIGERANT PIPING TO BE SIZED PER MANUFACTURERS RECOMMENDATIONS.
5. PROVIDE FACTORY SPECIFIED FILTER ON ALL RETURNS TO UNIT.
6. INDOOR UNIT ACCESS PANEL FIELD–PROVIDED.
7. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST
STREET SUITE 49674, MIAMI,
FL 33179 PH- 786.788.0295

3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M301
MECHANICAL SCHEDULES

CHECKED: NYE DRAWN: NYE

FOR QUESTIONS, CALL THE
Eastern North Carolina
REGION 36
PHONE: (919) 825 - 3566
EMAIL: reg36@captiveaire.com

PATENT NUMBERS

EXHAUST HOODS ND-2/BD-2/SND-2 (CANADA) - CA PATENT 2520435 C.

HOOD INFORMATION - JOB#7281029

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM	EXHAUST PLENUM RISER(S)							HOOD CONSTRUCTION	HOOD CONFIG	
										WIDTH	LENG	HEIGHT	DIA	CFM	VEL	SP		END TO END	ROW
1	KEH	4824 ND-2	CAPTIVEAIRE	6' 0"	450 DEG	I	MEDIUM	150	900			4"	12"	900	1146	-0.189"	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S)					LIGHT(S)			UTILITY CABINET(S)						FIRE SYSTEM PIPING	HOOD HANGING WEIGHT
		TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	TYPE	WIRE GUARD	LOCATION	SIZE	FIRE SYSTEM		ELECTRICAL	SWITCHES		
												TYPE	SIZE	MODEL #	QUANTITY		
1	KEH	SS BAFFLE WITH HANDLES	4	16"	16"	30%	4	L55 SERIES E26	NO	RIGHT	12"x48"x24"	TANK FS	4.0	SC-111110MA	1 LIGHT 1 FAN	YES	631 LBS

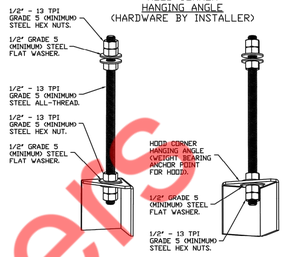
HOOD OPTIONS

HOOD NO	TAG	OPTION
1	KEH	FIELD WRAPPER 17.00" HIGH FRONT, LEFT, RIGHT.
		BACKSPLASH 120.00" HIGH X 84.00" LONG 430 SS VERTICAL.
		RIGHT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.
		LEFT QUARTER END PANEL 23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH 430 SS.
		INSULATION FOR BACK OF HOOD.
		RISER SENSOR INSTALL 6IN PLEN.
		DI-PSP 10" 250CFM (QTY. 5).

DIFFUSER SCHEDULE

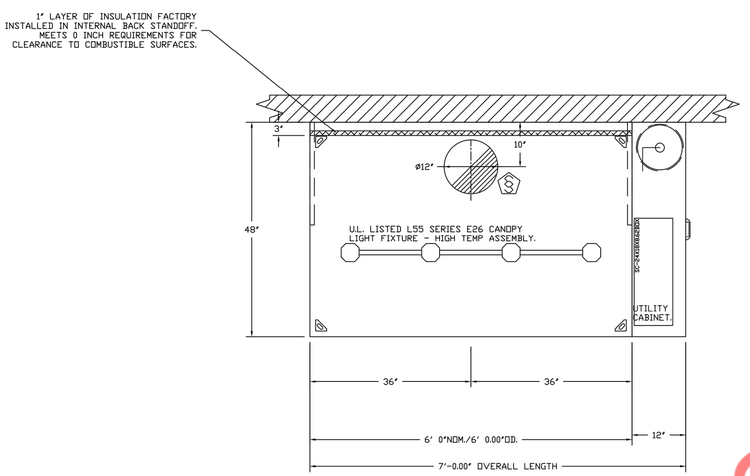
TAG	MODEL	CEILING HEIGHT	NOMINAL FACE SIZE	RISER DIA	CFM	DUCT VELOCITY (FPM)	FACE DISCHARGE VELOCITY (FPM)	T50 AFF	SP	NOISE CRITERIA	LINKED FAN	LINKED HOOD
	DI-PSP-10-24X24	10'	24 X 24	10	250	459	74	8.00'	0.051"	27		4824ND-2

HOOD CORNER HANGING ANGLE (HARDWARE BY INSTALLER)

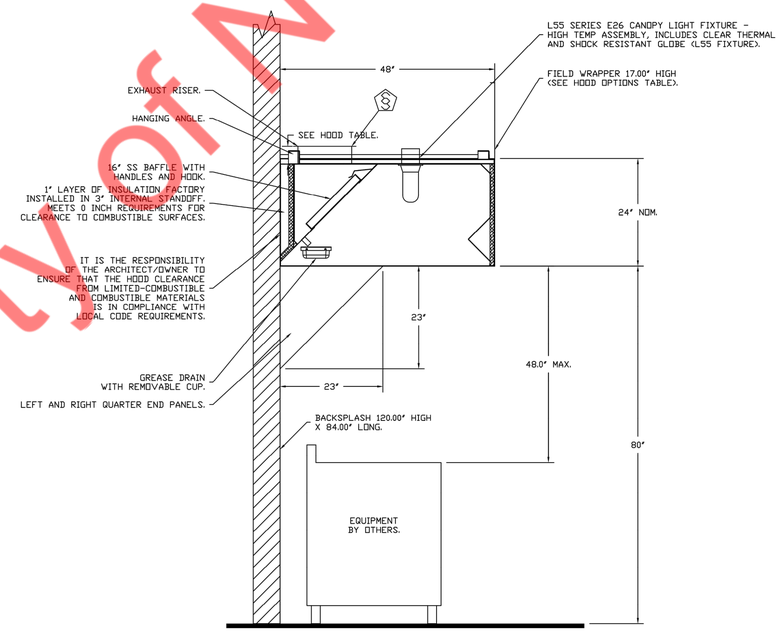


ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" - 13 TPI GRADE 5 (MINIMUM) ALL-THREAD. SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 (MINIMUM) STEEL FLAT WASHERS AND 1/2" - 13 TPI GRADE 5 (MINIMUM) HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLES AND ABOVE CEILING ANCHORS. MAINTAIN 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.



PLAN VIEW - HOOD #1 (KEH)
6' 0.00" LONG 4824ND-2



SECTION VIEW - MODEL 4824ND-2
HOOD - #1 (KEH)

REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

CAPTIVEAIRE
Eastern North Carolina
4641 Paragon Park Rd., Raleigh, NC. 27616 PHONE: (919) 825 - 3566 FAX: 9192279917 EMAIL: reg36@captiveaire.com
www.captiveaire.com

DUCK DONUTS-St Rose, Las Vegas NV

DATE: 1/16/2025

DWG.#: 7281029

DRAWN BY: reg36

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 1

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH- 786.788.0295

3/31/2025 BUILDING COMMENTS

NO DATE REMARKS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M401
HOOD DRAWING

CHECKED: NYE DRAWN: NYE

UL 300 HOOD FIRE SUPPRESSION SYSTEM

TANK/CAS ELECTRIC WET CHEMICAL

The TANK / CAS-EWC Fire Suppression System has been tested and certified to the UL 1254 Standard for Pre-Engineered Chemical Extinguishing System Units and UL/ULC 300 Standard for Fire Extinguishing Systems for Protection of Commercial Cooking Equipment and is listed with Underwriters Laboratories (UL) under file number EX3559.

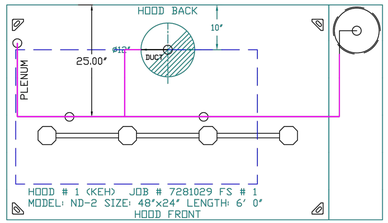
SEQUENCE OF OPERATIONS
The TANK / CAS-EWC fire system is a self-contained pressurized fire suppression system. TANK / CAS-EWC is activated when the electric firestat contacts close (at determined firestat setting and/or temperature rate-of-rise of 40°F per minute) and/or the manual activation station is pushed, an electric signal is sent to the release solenoid of the fire system. When the release solenoid is opened, it allows stored pressure from the primary tank to travel through the primary actuator kit opening a pneumatic actuator. The pneumatic actuator forces the plunger in the tank valve body to open, allowing the liquid fire suppressant to be distributed throughout the fire system piping network over the protected hazard area.

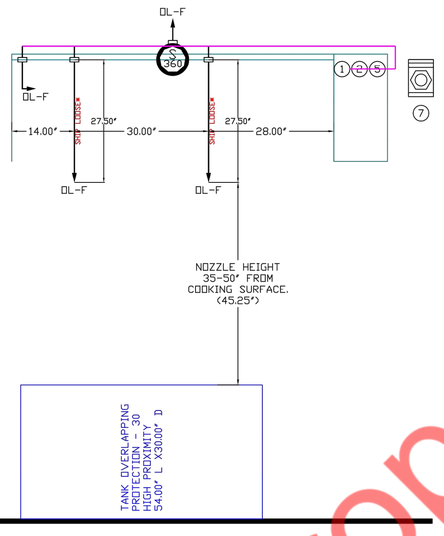
CAPTIVE-AIRE HOODS ARE BUILT IN COMPLIANCE WITH:

CAPTIVE-AIRE HOODS ARE BUILT IN COMPLIANCE WITH
NFPA #96
NSF
UL 710 & ULC710 STANDARDS
E.T.L. LISTED 3054804-001

FOR QUESTIONS
CONTACT: REGION 36
EASTERN NORTH CAROLINA

PHONE: (919) 825-3566
EMAIL: REG36@CAPTIVEAIRE.COM





FIRE SYSTEM INFORMATION – JOB#7281029

FIRE SYSTEM NO	TAG	TYPE	SIZE	MAX FP	DESIGN FP	INSTALLATION	
						SYSTEM	LOCATION ON HOOD
1		TANK FS	4.0	20	18	FIRE CABINET RIGHT	RIGHT, HOOD 1

NOTES
- FIELD PIPE DROPS AS SHOWN
  PIPING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
- FIELD INSTALLED DROP: FACTORY WILL PROVIDE QTY 2 60IN LONG PIECES OF CHROME PLATED PIPING SHIPPED LOOSE TO BE FIELD-INSTALLED.
- SHIP LOOSE DROP: FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED SHIPPED LOOSE TO BE FIELD-INSTALLED.
- RELOCATE NOZZLES IF FLOW PATTERN IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- OVERLAPPING COVERAGE SHALL NOT BE USED ON ANY APPLIANCE WITH AN OBSTRUCTION.
- IF APPLICABLE, EXTENDED PRE-PIPED DROPS ARE SHIPPED LOOSE.
- FACTORY PIPING EXTENDS A MAXIMUM OF 6" ABOVE THE TOP OF THE HOOD.

- APPLIANCE DIMENSIONS LISTED REPRESENT THE COOKING SURFACE SIZE, NOT THE OVERALL APPLIANCE SIZE.

- THIS FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.

- DL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS

JOB #: 7281029.
JOB NAME: DUCK DONUTS-ST ROSE, LAS VEGAS NV.

SYSTEM SIZE: TANK-SP-1 DESIGN FP: 18. MAXIMUM FP: 20.
HOOD # 1 6' 0.00" LONG x 48" WIDE x 24" HIGH.
RISER # 1 SIZE: 12" DIA.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

- HEAVY-DUTY APPLIANCES (RATED 600°F) WILL REQUIRE AN ADDITIONAL DOWNSTREAM FIRESTAT IN THE EVENT THAT THE DUCTWORK CONTAINS ANY HORIZONTAL RUNS OVER 25 FT IN LENGTH.
- MEDIUM TO LIGHT-DUTY APPLIANCES (RATED 450°F) WILL NOT REQUIRE ANY ADDITIONAL DOWNSTREAM DETECTION.

AGENT DISTRIBUTION PIPING LIMITATIONS	
PIPE SECTION	MAX PIPE LENGTH (FT)
MAX SUPPLY LINE TO FIRST OVERLAPPING NOZZLE	42
OVERLAPPING NOZZLE APPLIANCE BRANCH	10
DEDICATED NOZZLE APPLIANCE BRANCH	10

LEGEND – FIRE CABINET TANK SYSTEM

1 4 GALLON TANK.
2 PRIMARY ACTUATOR RELEASE.
3 SECONDARY ACTUATOR RELEASE.
4 PRESSURE SUPERVISION SWITCH.
5 PRIMARY HOSE ASSEMBLY.
6 SECONDARY HOSE ASSEMBLY.
7 REMOTE MANUAL ACTUATION DEVICE.

REVISIONS

	DESCRIPTION	DATE:
△		
△		
△		
△		

CAPTIVE-AIRE
Eastern North Carolina
4641 Paragon Park Rd., Raleigh, NC. 27616 PHONE: (919) 825 - 3566 FAX: 9192275917 EMAIL: reg36@captiveaire.com
www.captiveaire.com

DUCK DONUTS-St Rose, Las Vegas NV

DATE: 1/16/2025

DWG.#: 7281029

DRAWN BY: reg36

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 2

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST
STREET SUITE 49674, MIAMI,
FL 33179 PH: 786.788.0295

△ 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M402
HOOD DRAWING

CHECKED: NYE DRAWN: NYE

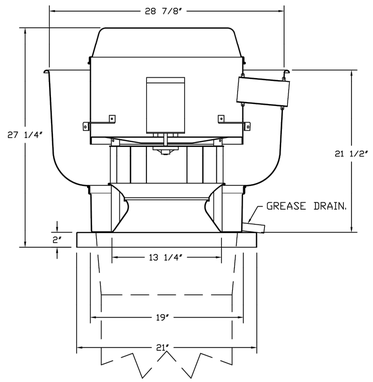
EXHAUST FAN INFORMATION – JOB#7281029

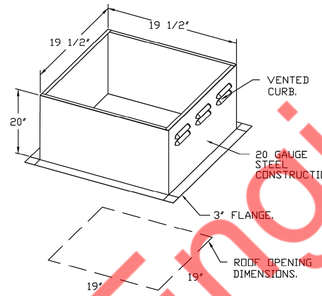
FAN UNIT NO	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR ENCL	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	SONES
1	KEF-1	1	DU50HFA	CAPTIVEAIRE	900	0.900	1400	TEAO-ECM	0.500	0.2810	1	115	6.3	342 FPM	78	13.4
2	TEF-1 (TOILET)	1	CFA-D90-CA	CAPTIVEAIRE	75	0.250	721	GENERALPURPOSE	0.043	0.0310	1	115	0.3		10	2.6

CURB ASSEMBLIES

NO	ON FAN	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	27 LBS	CURB	19.500"W X 19.500"L X 20.000"H VENTED.

FAN #1 DU50HFA - EXHAUST FAN (KEF-1)





FEATURES:

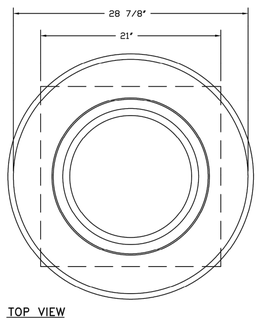
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED FANS.
- RESTAURANT MODEL.
- UL705 AND UL762 AND ULC-S645
- VARIABLE SPEED CONTROL.
- INTERNAL WIRING.
- THERMAL OVERLOAD PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATION 300°F (149°C).
- GREASE CLASSIFICATION TESTING.
- NEMA 3R SAFETY DISCONNECT SWITCH.

NORMAL TEMPERATURE TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING AIR AT 300°F (149°C) UNTIL ALL FAN PARTS HAVE REACHED THERMAL EQUILIBRIUM, AND WITHOUT ANY DETERIORATING EFFECTS TO THE FAN WHICH WOULD CAUSE UNSAFE OPERATION.

ABNORMAL FLARE-UP TEST
EXHAUST FAN MUST OPERATE CONTINUOUSLY WHILE EXHAUSTING BURNING GREASE VAPORS AT 600°F (316°C) FOR A PERIOD OF 15 MINUTES WITHOUT THE FAN BECOMING DAMAGED TO ANY EXTENT THAT COULD CAUSE AN UNSAFE CONDITION.

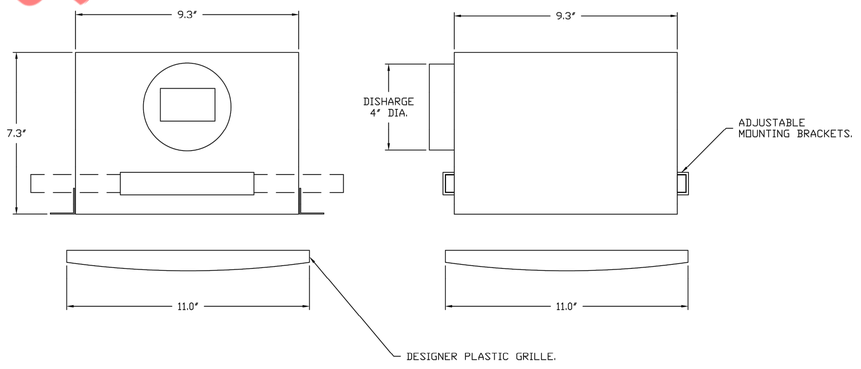
OPTIONS

- GREASE BOX.
- ECM WIRING PACKAGE - MANUAL OR 0-10VDC REFERENCE SPEED CONTROL -RTC- (TELCO MOTOR), CCW ROTATION.
- 2 YEAR PARTS WARRANTY.



TOP VIEW

FAN #2 CFA-D90-CA - EXHAUST FAN (TEF-1 (TOILET))



FEATURES:

- 20 GA. GALVANIZED STEEL HOUSING.
- PLUG TYPE DISCONNECT.
- BUILT IN AUTOMATIC BACKDRAFT DAMPER.
- UL LISTED.
- MOUNTING BRACKETS.

OPTIONS

- ROOF CAP - SLOPED, PAINTED STEEL W/ 6" DUCT COLLAR.
- FAN CONTROL - 3 AMP WHITE SPEED CONTROL FOR CFA CEILING FAN.
- 2 YEAR PARTS WARRANTY.

REVISIONS

	DESCRIPTION	DATE:
1		
2		
3		
4		

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DUCK DONUTS-St Rose, Las Vegas NV

DATE: 1/16/2025

DWG.#: 7281029

DRAWN BY: reg36

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 3

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH- 786.788.0295

3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

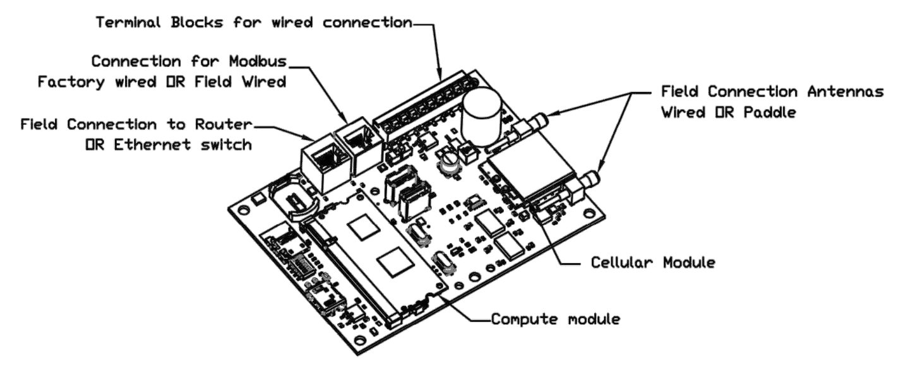
PROJECT NO: 2023.0204
DATE: 03.25.2025

M403
HOOD DRAWING

CHECKED: NYE DRAWN: NYE

ELECTRICAL PACKAGE – JOB#7281029

NO	TAG	PACKAGE #	LOCATION	SWITCHES		OPTION	FANS CONTROLLED					
				LOCATION	QUANTITY		FAN TAG	TYPE	ϕ	HP	VOLT	FLA
1		SC-111110MA	UTILITY CABINET RIGHT	UTILITY CABINET RIGHT	1 LIGHT	SMART CONTROLS THERMOSTATIC CONTROL W/ RELAY ON/OFF WITH SUPPLY	KEF-1	EXHAUST	1	0.500	115	6.3
				HOOD # 1	1 FAN			SUPPLY	1	0.022	115	0.2



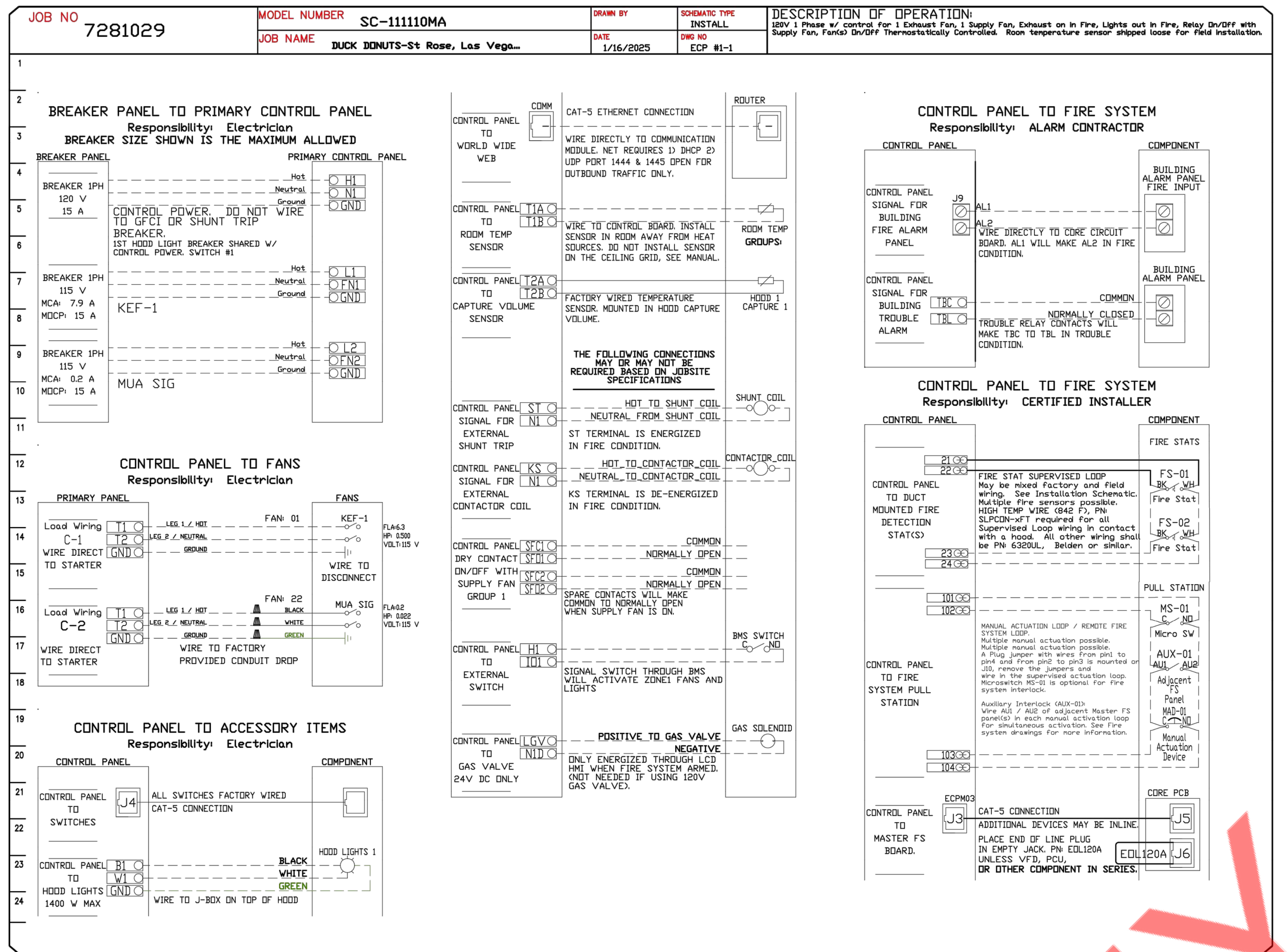
CASlink Monitor and Control

– Hood control panel to support communications to cloud-based Building Management System.
– Hood Control Panel to allow cloud-based Building Management System to monitor real time parameters outlined as MONITOR in the points list.
– Hood Control Panel to allow cloud-based Building Management System to control parameters outlined as CONTROL in the points list.
– Hood Control Panel to allow cloud-based Building Management System to implement SYSTEM ECONOMIZER control strategies for fully integrated Building Management.

MONITORING AND CONTROL POINTS LIST

DCV Packages	Function
Room Temperature	MONITOR
Duct Temperature(s)	MONITOR
MUA Discharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Fan Speed	MONITOR
Fan Amperage	MONITOR
Fan Power	MONITOR
VFD Faults	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults	MONITOR
PCU Filter Clog Percentages	MONITOR
Fire Condition	MONITOR
CORE Fire System	MONITOR
Building Pressures	MONITOR
Prep Time Button	MONITOR & CONTROL
Fans Button	MONITOR & CONTROL
Lights Button	MONITOR & CONTROL
Wash Button	MONITOR & CONTROL

SC Packages	Function
Room Temperature(s)	MONITOR
Duct Temperature(s)	MONITOR
MUA DIscharge Temperature	MONITOR
Kitchen RTU Discharge Temperature	MONITOR
Controller Faults	MONITOR
Fan Faults	MONITOR
Fan Status	MONITOR
PCU Faults	MONITOR
PCU Filter Clog Percentages	MONITOR
Fire Condition	MONITOR
CORE Fire System	MONITOR
Building Pressures	MONITOR
Fans Button(s)	MONITOR & CONTROL
Lights Button(s)	MONITOR & CONTROL
Wash Button	MONITOR & CONTROL



JOB NO 7281029 | MODEL NUMBER SC-111110MA | JOB NAME DUCK DONUTS-St Rose, Las Vega... | DRAWN BY | DATE 1/16/2025 | SCHEMATIC TYPE INSTALL | DWG NO ECP #1-3 | DESCRIPTION OF OPERATION: Fire System #1 TANK FS – 4.0.

TANK PROTECTION ELECTRICAL DETAIL

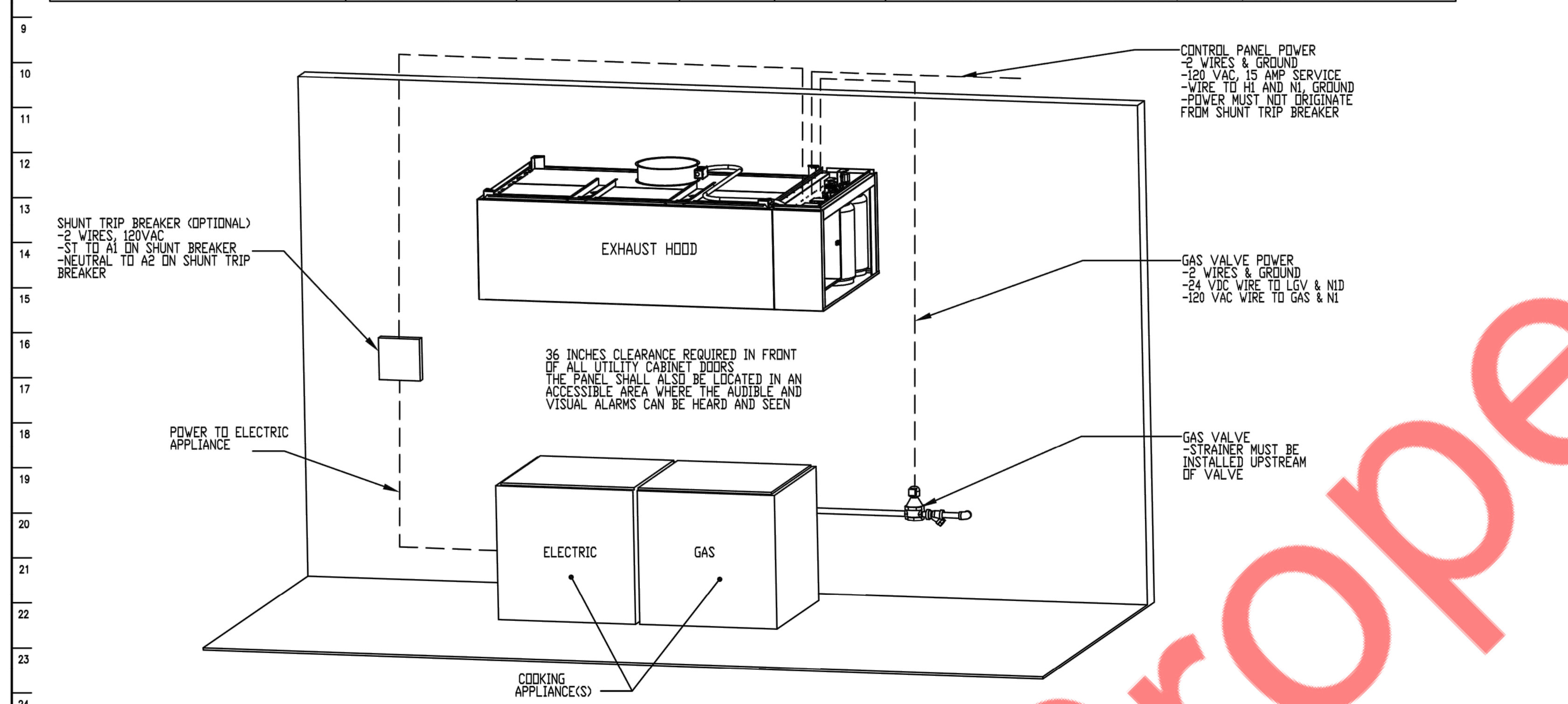
02/10/2021 Rev. 2

FS-1: MASTER

ELECTRICIAN:
1. WIRE MAIN CONTROL PANEL PER INCLUDED SCHEMATIC
2. WIRE ALL FANS PER INCLUDED SCHEMATIC
3. WIRE SHUNT TRIP BREAKER (OPTIONAL)
4. WIRE UDS APPLIANCE KILL SWITCH, IF EQUIPPED (OPTIONAL)
5. WIRE GAS VALVE

ELECTRICAL CONTRACTOR REQUIREMENT

ITEM	CONNECTION IN PANEL	CONNECTION IN DEVICE	VOLTAGE	AMPERAGE	COMMENTS
SHUNT TRIP BREAKER (OPTIONAL)	ST & N1	BREAKER COIL (A1 & A2)	120 VAC	< 4 AMPS	ST TO A1 ON SHUNT BREAKER COIL, AND NEUTRAL TO A2 ON SHUNT TRIP BREAKER COIL
CONTROL PANEL POWER	H1 & N1 + GROUND	CIRCUIT BREAKER	120 VAC	15 AMPS	CONTROL PANEL POWER MUST NOT BE RUN THROUGH SHUNT TRIP BREAKER
UDS APPLIANCE KILL SWITCH (OPTIONAL)	KTS & N1	KTS & N1	120 VAC	< 4 AMPS	KILL SWITCH TERMINALS MUST BE IN SERIES WITH OTHER KILL SWITCHES
REMOTE 120VAC ANSUL AUTOMAN (OPTIONAL)	AU1, AU2	SOLENOID	120 VAC	< 6 AMPS	120V TO AU1, AU2 TO ANSUL ELECTRIC AUTOMAN, ANSUL SOLENOID TO NEUTRAL
GAS VALVE	LGV & N1D (IF 24 VDC) GAS & N1 (IF 120 VAC)	RED/RED/GREEN	24 VDC OR 120 VAC	< 1.0 AMPS	IF 24 VDC – 2 WIRES & GROUND, N1D TO RED, LGV TO RED, AND GREEN TO GROUND IF 120 VAC – 2 WIRES & GROUND GAS TO RED, N1 TO RED, AND GREEN TO GROUND



NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

JOB NO 7281029 | MODEL NUMBER SC-111110MA | JOB NAME DUCK DONUTS-St Rose, Las Vega... | DRAWN BY | DATE 1/16/2025 | SCHEMATIC TYPE INSTALL | DWG NO ECP #1-4 | DESCRIPTION OF OPERATION: Fire System #1 TANK FS – 4.0.

TANK PROTECTION LOW-VOLTAGE DETAIL

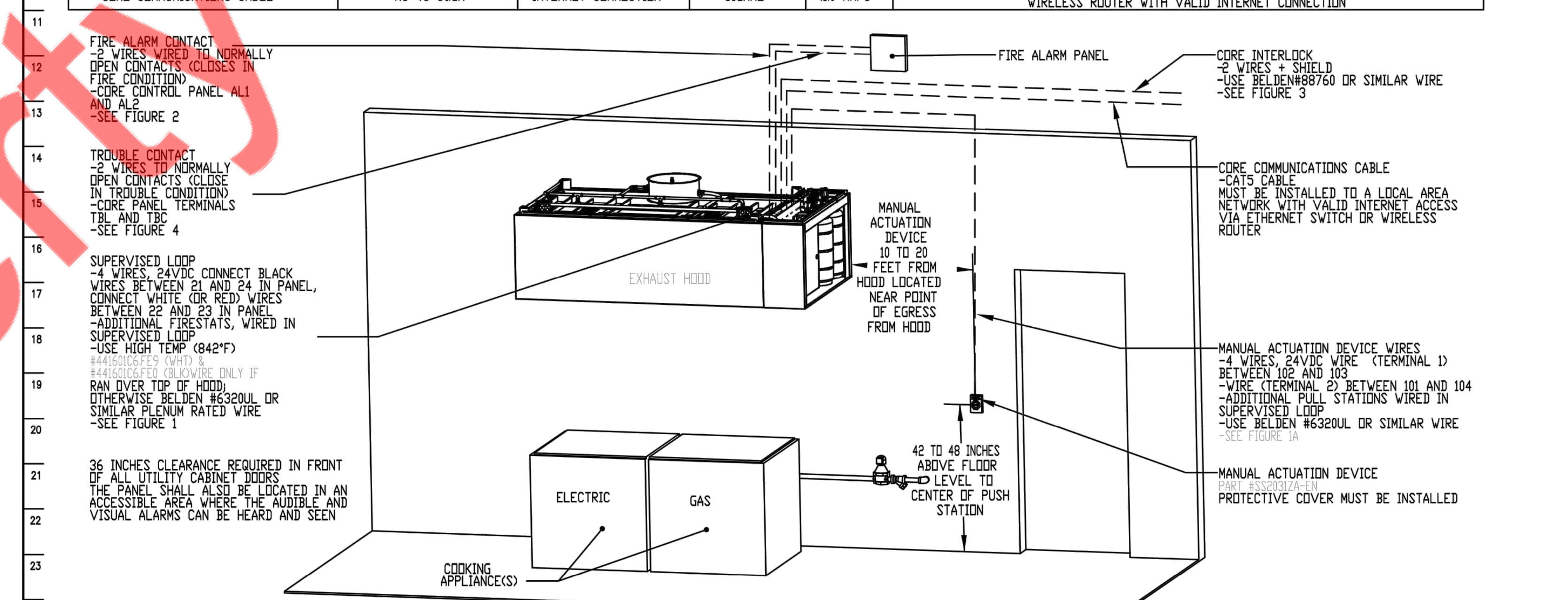
10/01/2023 Rev. 3

FS-1: MASTER

ALARM CONTRACTOR:
1. WIRE MANUAL ACTUATION DEVICE(S), REMOTE FIRESTAT(S), CORE INTERLOCK(S), FIRE SENSOR(S) AND FIRE ALARM CONTACTS
2. COMPLETE FINAL HOOKUP OF SYSTEM
3. VERIFY FINAL FIRE SYSTEM TEST

ALARM CONTRACTOR REQUIREMENT

ITEM	CONNECTION IN PANEL	CONNECTION ON DEVICE	VOLTAGE	AMPERAGE	COMMENTS
MANUAL ACTUATION DEVICE(S)	101 AND 104 102 AND 103	1 & 2	24 VDC	< 1.0 AMPS	WIRE MANUAL ACTUATION DEVICE TERMINAL 1 BETWEEN CORE PANEL TERMINALS 102 AND 103 WIRE MANUAL ACTUATION DEVICE TERMINAL 2 BETWEEN CORE PANEL TERMINALS 101 AND 104 JUMPER 101 TO 104 AND 102 TO 103 IF NO MANUAL ACTUATION DEVICE IS INSTALLED
MANUAL ACTUATION DEVICE COVER	N/A	N/A	N/A	N/A	MANUAL ACTUATION DEVICE COVER MUST BE INSTALLED IF SURFACE MOUNTED, USE COVER EXTENSION STI-6531B
REMOTE FIRESTAT SENSOR(S)	21 AND 24 22 AND 23	BLACK AND WHITE	24 VDC	< 1.0 AMPS	WIRE FIRE SENSOR WHITE WIRES BETWEEN HOOD CORE PANEL TERMINALS 22 AND 23 WIRE FIRE SENSOR BLACK WIRE BETWEEN HOOD CORE PANEL TERMINALS 21 AND 24 HIGH TEMP (842°F) #441601C6.FE9 (WHT) & #441601C6.FE0 (BLK)WIRE OR SIMILAR ONLY IF RAN OF HOOD; OTHERWISE BELDEN #6320UL OR SIMILAR PLENUM RATED WIRE; SEE FIGURE 1
FIRE ALARM CONTACT	AL1, AL2	VARIES	50V MAX (AC/DC)	UP TO 1 AMP	FIRE ALARM RELAY CONTACTS FOR BUILDING FIRE ALARM LOCATED IN THE CORE ELECTRICAL CONTROL PANEL
CORE INTERLOCK(S)	CA, CB, CC	CA, CB, CC	RS-485 COMMUNICATIONS SIGNAL		CORE SYSTEM (1) CA, TO CORE SYSTEM (2) CA, CORE SYSTEM (1) CB, TO CORE SYSTEM (2) CB, CORE SYSTEM (1) CC, TO CORE SYSTEM (2) CC. USE BELDEN# 88760 OR SIMILAR WIRE
TROUBLE CONTACT	TBC, TBL, TOK	VARIES	MAX 120 VAC	UP TO 6 AMPS	WIRE TO TBL & TBC NORMALLY OPEN CONTACT, CLOSES IN TROUBLE CONDITION
CORE COMMUNICATIONS CABLE	RJ-45 Jack	INTERNET CONNECTION	SIGNAL	<1.0 AMPS	TYPICAL CONNECTION CAT5 CABLE TO LOCAL AREA NETWORK VIA ETHERNET SWITCH OR WIRELESS ROUTER WITH VALID INTERNET CONNECTION



ATTENTION: LOW-VOLTAGE DC OR SIGNALING WIRE SHOULD BE ROUTED IN SEPARATE CONDUIT FROM ALL AC SOURCES

NOTE: SEE INSTALLATION, OPERATION, AND MAINTENANCE MANUAL FOR FURTHER INSTRUCTIONS

REVISIONS

DESCRIPTION	DATE:

CAPTIVEAIRE
www.captiveaire.com
Eastern North Carolina
4641 Paragon Park Rd., Raleigh, NC, 27616 PHONE: (919) 825 - 3566 FAX: 9192275917 EMAIL: reg36@captiveaire.com

DUCK DONUTS-St Rose, Las Vegas NV

DATE: 1/16/2025

DWG.#: 7281029

DRAWN BY: reg36

SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 4

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH- 786.788.0295

NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M404

HOOD DRAWING

CHECKED: NYE DRAWN: NYE

DUCTWORK #1 PARTS – JOB#7281029

TAG	PART #	CFM	GPM	ZONE	COVEREDBY	SP	WEIGHT	VELOCITY	QTY	DESCRIPTION
P1	DW1245ASY	900				-0.021	5.86	1145.92	1	SINGLE WALL DUCT 45 DEGREE ELBOW, 12" DUCT, ASSEMBLY.
P2	DW1217LT	900				-0.004	7.05	1145.92	1	SINGLE WALL DUCT 12" DIAMETER, 17" LONG, FLANGE AT BOTH ENDS. STAINLESS STEEL.
P3	DW12SUBRASY						2.76		1	DUCT SUPPORT BRACKET KIT, 12" DUCT, USED FOR HANGING DUCT. 12 GA STEEL, CLEAR ZINC COATING. - 2 RINGS, 4 BRACKETS, & HARDWARE BAG 2.
P4	DW1224AJDKIT	900				-0.003	12.47	1145.92	1	SINGLE WALL DUCT ADJUSTABLE, 12" DIAMETER, 23.5" LONG, FLANGE AT ONE END WITH A 12" ADJUSTABLE COLLAR - STAINLESS STEEL.
P5	DW1245ASY	900				-0.024	5.86	1145.92	1	SINGLE WALL DUCT 45 DEGREE ELBOW, 12" DUCT, ASSEMBLY.
P6 ASSEMBLED W/P7	DW12TEASY	900		1		-0.005	11.69	1145.92	1	SINGLE WALL DUCT TEE, 12" DUCT, ASSEMBLY.
P7 ASSEMBLED W/P6 O=T	DW1213ADIASY						11.53		1	DUCT ACCESS DOOR - INSULATED - USED WITH 12" DUCT - GREASE DAM INCLUDED - ASSEMBLY.
P8	DW1223LT	900				-0.005	9.41	1145.92	1	SINGLE WALL DUCT 12" DIAMETER, 23" LONG, FLANGE AT BOTH ENDS. STAINLESS STEEL.
P9	DW1248AJDKIT	900				-0.006	22.74	1145.92	1	SINGLE WALL DUCT ADJUSTABLE, 12" DIAMETER, 47.5" LONG, FLANGE AT ONE END WITH A 12" ADJUSTABLE COLLAR - STAINLESS STEEL.
P10 ASSEMBLED W/P11	DW1223LT	900				-0.005	9.41	1145.92	1	SINGLE WALL DUCT 12" DIAMETER, 23" LONG, FLANGE AT BOTH ENDS. STAINLESS STEEL.
P11 ASSEMBLED W/P10 O=B	DW1912TP	900					6.27	1145.92	1	DUCT TO CURB TRANSITION, 19-1/2" CURB TO 12" DUCT, 16 GA ALUMINIZED STEEL. USED ON BDU11, DU25, 30 & 33.
SYSTEM AT P11						-0.262	0.00			
	3M-2000PLUS						0.80		2	DUCT - 3M FIRE BARRIER 2000 PLUS SILICONE - USED AS SEALANT TO SEAL DUCT JOINTS.
	DW12CLASY						0.94		9	DUCT "V" CLAMP WITH NEW DESIGN 14 GA BRACKETS, 12" DUCT, ASSEMBLY.
TOTAL WEIGHT							115.11			

SINGLE WALL FACTORY BUILT DUCTWORK

- ALL DUCTWORK IS REQUIRED TO BE INSTALLED WITH THE MAXIMUM SUPPORT SPACING LISTED BELOW.
- FOR A COMPLETE LIST OF APPROVED SUPPORT METHODS, SEE THE INSTALLATION AND OPERATION MANUAL.
- DUCTWORK SHALL SLOPE NOT LESS THAN 1/16" PER LINEAR FOOT TOWARDS THE HOOD OR AN APPROVED GREASE COLLECTION RESERVOIR.
- WHERE HORIZONTAL DUCTS EXCEED 75 FEET IN LENGTH, THE SLOPE SHALL NOT BE LESS THAN 3/16" PER LINEAR FOOT.

DUCT DIAMETER	HORIZONTAL SUPPORT (FT)	VERTICAL WALL SUPPORT (FT)	VERTICAL CURB SUPPORT (FT)
5"	10'	10'	24'
6"	10'	10'	24'
7"	10'	10'	24'
8"	10'	10'	24'
10"	10'	10'	24'
12"	10'	10'	24'
14"	10'	10'	24'
16"	10'	10'	24'
18"	10'	10'	24'
20"	10'	10'	24'
22"	10'	10'	24'
24"	10'	10'	24'
26"	10'	10'	24'
28"	10'	10'	24'
30"	10'	10'	24'
32"	10'	10'	24'
34"	10'	10'	24'
36"	10'	10'	24'

DO NOT LEAK TEST USING SMOKE BOMBS CONTAINING CHLORINES/CHLORIDES. CONSULT WITH CAPTIVEAIRE FOR PROPER LEAK TESTING METHODS.

REVISIONS

	DESCRIPTION	DATE:
1		
2		
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4		

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DUCK DONUTS-St Rose, Las Vegas NV

DATE: 1/16/2025

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SCALE: 3/4" = 1'-0"

MASTER DRAWING

SHEET NO. 5

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH- 786.788.0295

1 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

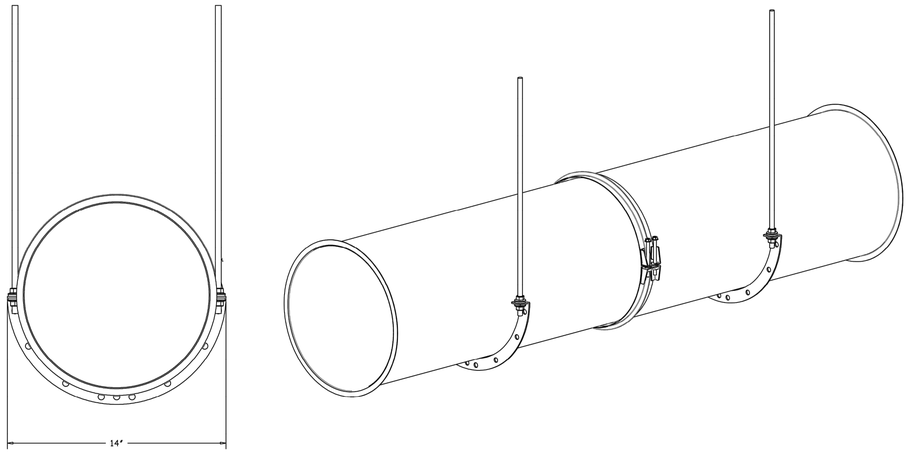
PROJECT NO: 2023.0204
DATE: 03.25.2025

M405
HOOD DRAWING

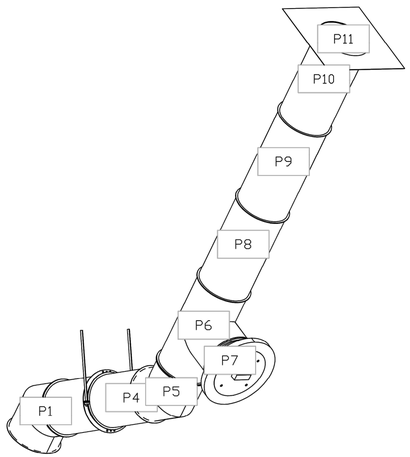
CHECKED: NYE DRAWN: NYE

SUPPORT SYSTEM DETAILS #1

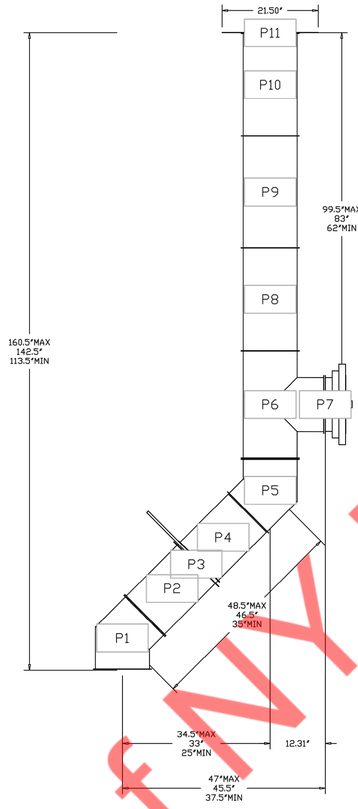
DW12SUBRASY - HORIZONTAL SUPPORT



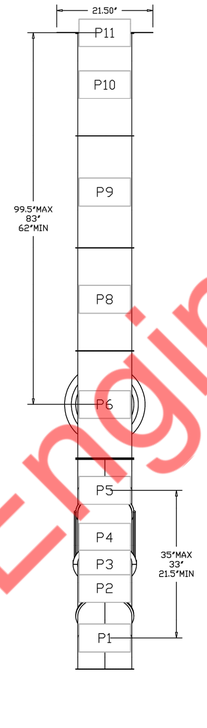
DUCTWORK #1 SE VIEW



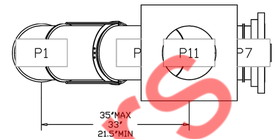
DUCTWORK #1 FRONT VIEW



DUCTWORK #1 SIDE VIEW



DUCTWORK #1 TOP VIEW



REVISIONS

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1		
2		
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4		

CAPTIVEAIRE
Eastern North Carolina
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DRAWN BY: reg36

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MASTER DRAWING

SHEET NO. 6

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST
STREET SUITE 49674, MIAMI,
FL 33179 PH- 786.788.0295

3/31/2025 BUILDING COMMENTS
NO DATE REMARKS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M406
HOOD DRAWING

CHECKED: NYE DRAWN: NYE

COM*check* Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2021 IECC
Project Title: Duck Donuts Las Vegas, NV
Location:
Climate Zone: 3b
Project Type: Alteration

Construction Site:

Owner/Agent:

Designer/Contractor:
MICHAEL TOBIAS
NY ENGINEERS
382 NE 191ST, SUITE 49674
MIAMI, Florida 33179

Mechanical Systems List

Quantity **System Type & Description**

1 RTU-1(N) (Single Zone):
Heating: 1 each - Central Furnace, Gas, Capacity = 114 kBtu/h
Proposed Efficiency = 80.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE
Cooling: 1 each - Single Package DX Unit, Capacity = 70 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 11.00 EER, Required Efficiency = 11.00 EER
Proposed Part Load Efficiency = 14.80 IEER, Required Part Load Efficiency = 14.60 IEER

1 ACCU-1(N) (Single Zone):
Split System Heat Pump
Heating Mode: Capacity = 80 kBtu/h,
Proposed Efficiency = 4.03 COP, Required Efficiency = 3.40 COP
Cooling Mode: Capacity = 72 kBtuh, , Air Economizer
Proposed Efficiency = 11.00 EER, Required Efficiency = 11.00 EER
Proposed Part Load Efficiency = 21.60 IEER, Required Part Load Efficiency = 14.10 IEER

1 WH-1:
Gas Storage Water Heater, Capacity: 74 gallons, Input Rating: 75 kBtu/h w/ Circulation Pump
Proposed Efficiency: 80.00 % Et, Required Efficiency: 80.00 % Et

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2021 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

MICHAEL TOBIAS — Name - Title
Signature
03/25/2025 — Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2021 IECC

Requirements: 100.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical and service water heating systems and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6][3]	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.1, C404.6.2 [PL3][3]	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.3 [PL7][3]	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.1, C404.6.1.1 [PL8][3]	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C402.2.6 [ME41][3]	Thermally ineffective panel surfaces of sensible heating panels have insulation >= R-3.5.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.12.3 [ME61][2]	HVAC piping insulation insulated in accordance with Table C403.11.3. Insulation exposed to weather is protected from damage and is provided with shielding from solar radiation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.8.1 [ME65][3]	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met. *See the Mechanical Systems list for values.*
C403.8.3 [ME117][3]	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Fans integral to equipment listed under Section C403.3.2.
C403.8.3 [ME117][2]	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Fans integral to equipment listed under Section C403.3.2.
C403.9 [ME144][2]	Large diameter fans where installed shall be tested and labeled in accordance with AMCA 230.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.13.1 [ME71][2]	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3 [ME55][2]	HVAC equipment efficiency verified.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	*See the Mechanical Systems list for values.*
C403.5.5 [ME113][2]	Fault detection and diagnostics installed with air-cooled unitary DX units or VRF units having economizers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.2.2 [ME59][2]	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.7.1 [ME59][1]	Demand control ventilation provided for spaces >500 ft2 and >15 people/1000 ft2 occupant density and served by systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.2 [ME115][3]	Enclosed parking garage ventilation has automatic contaminant detection and capacity to stage or modulate fans to 50% or less of design capacity.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.6 [ME141][3]	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.4 [ME57][1]	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.5 [ME116][3]	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.12.1 C403.12.2 [ME60][2]	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62][1]	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.2 [ME16][1]	Economizer operation will not increase heating energy use during normal operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.3 [ME124][1]	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.4 [ME125][1]	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3.5 [ME126][1]	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.3.3.2 [ME121][3]	Closed-circuit cooling tower within heat pump loop have either automatic bypass valve or lower leakage positive closure dampers. Open-circuit tower within heat pump loop have automatic valve to bypass all heat pump water flow around the tower. Open- or closed-circuit cooling towers used in conjunction with a separate heat exchanger have heat loss by shutting down the circulation pump on the cooling tower loop. Open- or closed circuit cooling towers have a separate heat exchanger to isolate the cooling tower from the heat pump loop, and heat loss is controlled by shutting down the circulation pump on the cooling tower loop.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.4.1.4 [ME63][2]	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.3.3 [ME35][1]	Hot gas bypass limited to: <=240 kBtu/h – 50% >240 kBtu/h – 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.2.1 [ME111][2]	Gas-fired water-heating equipment installed in new buildings: where a singular piece of water-heating equipment >= 1,000 kBtu/h serves the entire building, thermal efficiency >= 92 Et. Where multiple pieces of water-heating equipment serve the building with combined rating >= 1,000 kBtu/h, the combined input-capacity-weighted-average thermal efficiency >= 90 Et. Exclude input rating of equipment in individual dwelling units and equipment <= 100 kBtu/h.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.2.1 [ME53][3]	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.11.3 C403.11.3.1 C403.11.3.2 [ME123][3]	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.11.3.1 and refrigeration compressor systems that comply with C403.11.3.2.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.7 [EL26][2]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.8 [EL27][2]	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.9.1, C405.9.2 [EL28][2]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.10 [EL29][2]	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.1.1 [EL30][2]	At least 90% of dwelling unit permanently installed lighting shall have lamp efficacy >= 65 lm/W or luminaires with efficacy >= 45 lm/W or comply with C405.2.4 or C405.3.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C405.11, C405.11.1 [EL31][2]	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and > 25% of branch circuit feeders for modular furniture will have automatic receptacle control in accordance with C405.11.1.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8][3]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.1.1 [FI50][3]	HVAC systems and equipment design loads calculated in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.1 [FI27][3]	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1 [FI47][3]	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1.1 [FI42][3]	Heat pump controls prevent supplemental electric resistance heat from coming on when not needed.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1.2 [FI38][3]	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1.3 [FI20][3]	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.2 [FI39][3]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.2.1, C403.4.2.2 [FI40][3]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.3 [FI11][3]	Heat traps installed on supply and discharge piping of non-circulating systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.4 [FI25][2]	All piping insulated in accordance with section details and Table C403.12.3.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.1 [FI12][3]	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST STREET SUITE 49674, MIAMI, FL 33179 PH- 786.788.0295

NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M501
ENERGY CALCULATIONS

CHECKED: NYE DRAWN: NYE

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.1.1 [FI57][1]	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	
C408.2.1 [FI28][1]	Commissioning plan developed by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.1 [FI31][1]	HVAC equipment, systems and system-to-system relationships have been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.2 [FI10][1]	HVAC and service water heating control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.3.3 [FI32][1]	Economizers have been tested to ensure proper operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.4 [FI29][1]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5 [FI7][1]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.1 [FI43][1]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5.2 [FI30][1]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1	High Impact (Tier 1)	2	Medium Impact (Tier 2)	3	Low Impact (Tier 3)

NY ENGINEERS
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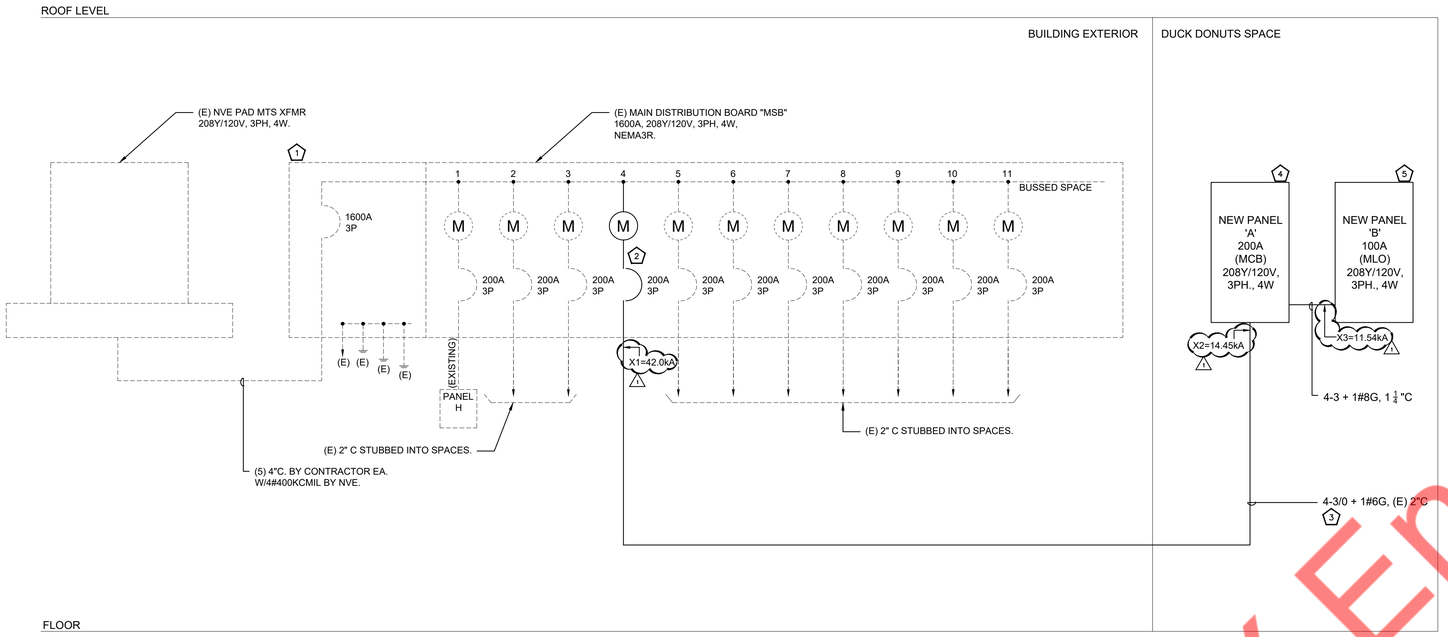
1 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

M502
ENERGY CALCULATIONS

CHECKED: NYE DRAWN: NYE



1 ELECTRICAL RISER DIAGRAM
SCALE: N.T.S.

EATON
BUSSMANN SERIES

FC² available fault current calculator

Your System Details

Project Name: Duck Donuts-Las Vegas, NV
System Type: Three-Phase
Creator Name:
Creator Email:
Creator Company/Organization:
Creator Title/Position: Electrical Engineer
Creation Date: Mar 24, 2025 @ 5:33am

FAULT - X1
$I_{sym\,rms\ (t=0.5)}$ 42.000 AMPS
Voltage (L-L) 208 V

CONDUCTOR RUN - C1 (CONDUCTOR)
LENGTH 70 FT
SIZE 3/0
QTY (per phase) 1
TYPE Three Single Conductors
CONDUIT Steel
WIRE Cu, 600 V

FAULT - X2
$I_{sym\,rms\ (t=0.5)}$ 14.452 AMPS
Voltage (L-L) 208 V

CONDUCTOR RUN - C2 (CONDUCTOR)
LENGTH 10 FT
SIZE 3
QTY (per phase) 1
TYPE Three Single Conductors
CONDUIT Steel
WIRE Cu, 600 V

FAULT - X3
$I_{sym\,rms\ (t=0.5)}$ 11.543 AMPS
Voltage (L-L) 208 V

Created Using Eaton's Bussmann Series - Available Fault Current Calculator 1.5 Page 1

2 ELECTRICAL SHORT CIRCUIT CALCULATIONS
SCALE: N.T.S.

ELECTRICAL RISER KEY NOTES:

1. EXISTING ELECTRICAL SERVICE FOR PROJECT SPACE SHALL REMAIN. COORDINATE EXACT LOCATION WITH OWNER/LANDLORD. REPORT IF ANY DISCREPANCIES OBSERVED.
2. E.C SHALL VERIFY AVAILABILITY OF EXISTING ELECTRICAL METER AND DISCONNECT SWITCH AT SITE AND REUSE. IF NOT PROVIDE NEW 200A, 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL METER AND DISCONNECT SWITCH FOR PROJECT SPACE. E.C SHALL COORDINATE WITH LANDLORD/OWNER/UTILITY COMPANY FOR EXACT LOCATION IN FIELD. BASE BID ACCORDINGLY.
3. E.C. SHALL PROVIDE NEW FEEDER AS SHOWN INTO EXISTING CONDUIT AT THE TENANT SPACE FROM MAIN DISTRIBUTION BOARD. DISCUSS SCOPE OF WORK ARCHITECT/OWNER/LANDLORD PRIOR TO BID. E.C. SHALL VERIFY THE OPERABLE CONDITION OF THE EXISTING CONDUIT AND PROVIDE NEW IF FOUND IN-OPERABLE. BASE BID ACCORDINGLY.
4. NEW 200A, 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A". FOR PROJECT SPACE. E.C. TO COORDINATE WITH OWNER/ARCHITECT FOR EXACT LOCATION OF NEW PANEL "A" IN FIELD.
5. NEW 100A, 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B". FOR PROJECT SPACE. E.C. TO COORDINATE WITH OWNER/ARCHITECT FOR EXACT LOCATION OF NEW PANEL "B" IN FIELD.

ELECTRICAL RISER SYMBOL

NEW

EXISTING ITEM/FEEDER TO REMAIN

NOTE:
CONTRACTOR TO PROVIDE TYPED PANEL SCHEDULE FOR PANEL SHOWING ALL CIRCUIT LABELS PROVIDE ENGRAVED NAME PLATE FOR PANELS AS WELL AS ENGRAVED NAME PLATES WITH BUILDING NUMBER AND TENANT NAME ON METER SOCKET/DISCONNECT.

ALL WIRE IS SIZED PER 75° C ALL EQUIPMENT IS TO BE PROVIDED UL LISTED FOR 75° C.

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.

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

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

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

FIELD VERIFY ALL CONDITIONS

NOTE! ALL WIRING LAYOUTS, PIPING LAYOUTS AND DUCT LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONSTRUCTION AND STRUCTURE OF THE BUILDING AND SHALL BE VERIFIED AND COORDINATED IN THE FIELD. EACH TRADE CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THAT A THOROUGHLY REVIEWED AND COORDINATION OF ALL LOCATIONS AND ROUTINGS WITH ALL OTHER TRADES PRIOR TO FABRICATION OF CONDUITS, DUCTS, OR PIPING, AND START OF INSTALLATION OF SAME (INCLUDING SPRINKLER PIPING WHEN PRESENT ON JOB). ANY INSTALLATION OR CONSTRUCTION CONFLICTS WHICH OCCUR IN THE FIELD SHALL BE RESOLVED BY THE TRADE PROVIDER TO THE SATISFACTION OF THE OWNER AND/OR ARCHITECT AND AT NO EXPENSE TO THE OWNER, ARCHITECT AND/OR GENERAL CONTRACTOR.

THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN THE 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 ALL CODES, REGULATIONS, UTILITY REQUIREMENTS, LAWS AND ORDINANCES APPLICABLE TO THIS SITE AND SHALL INCLUDE IN THE BID THE COSTS FOR ALL WORK PROVIDED IN STRICT ACCORDANCE WITH THESE GOVERNING ITEMS, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING. THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER AND/OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT FOR DIRECTIONS.

GENERAL NOTES:

1. ALL WORK SHOWN SHALL COMPLY WITH ALL NATIONAL, STATE AND LOCAL CODES, ORDINANCES, ETC.
2. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE FOLLOWING CODES:
   - 2018 INTERNATIONAL BUILDING CODE
   - 2018 INTERNATIONAL FIRE CODE
   - 2018 UNIFORM MECHANICAL CODE
   - 2018 UNIFORM PLUMBING CODE
   - 2017 NATIONAL ELECTRICAL CODE
   - 2021 INTERNATIONAL ENERGY CONSERVATION CODE
3. SEE LIGHTING FIXTURE SCHEDULE ON SHEET E101 FOR INFORMATION.
4. EXIT SIGNS AND EMERGENCY LIGHTS SHALL HAVE THEIR OWN SELF-CONTAINED STANDBY BATTERY POWER SUPPLY. IF LOCAL CODE REQUIRES A DIRECT TAP BEFORE ANY CIRCUIT BREAKERS THEN INCORPORATE INTO THE FEEDER DIAGRAM.
5. PROVIDE EMERGENCY LIGHTING TO MEET THE REQUIRED FOOT CANDLE LEVEL PER LOCAL CODE.
6. LUMINAIRES INSTALLED IN CONTINUOUS ROWS SHALL BE GROUNDED WITH A CONDUCTOR ROUTED FROM LUMINAIRE TO LUMINAIRE, MOUNTED TO EACH WITH GROUNDING LUG OR SCREW. ALIGNING CLIPS ARE NOT ACCEPTABLE. LUMINAIRE GROUNDING SHALL BE INSTALLED IN COMPLIANCE WITH NATIONAL ELECTRICAL CODE, ARTICLE 410-21.
7. CEILING LIGHTS ARE TO BE WIRED TO THE BAR JOIST MEMBERS AT THE DIAGONAL CORNERS.
8. COORDINATE LIGHTING WITH SPRINKLER & MECHANICAL DRAWINGS.
9. REFERENCE TO HEIGHT OF OUTLET OR RECEPTACLE SHALL BE MEASURED FROM FINISHED FLOOR TO CENTER OF OUTLET OR RECEPTACLE.
10. ALL RECEPTACLES SHALL BE GROUNDING TYPE.
11. ALL RECEPTACLES AND SWITCHES SHALL HAVE TWO (2) REVOLUTIONS OF ELECTRICAL TAPE (SCOTCH 33+) OVER ALL THE TERMINALS, TO PREVENT ACCIDENTAL CONTACT WITH THE JUNCTION BOX OR OUTLET BOX.
12. CONDUIT SIZE TO BE PER NEC. PVC CONDUIT AND FITTINGS ARE ACCEPTABLE ONLY BELOW SUBBASE MATERIAL OF GROUND BEARING FLOOR SLABS WHERE SUCH USE IS ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
13. CONDUIT SHALL BE ELECTRICAL METALLIC TUBING (EMT), RIGID STEEL (SIZE PER NEC), OR MC CABLE WHERE ALLOWED BY CODE. WHERE MC CABLE IS USED, PROPER SECUREMENT AND SUPPORT (AT INTERVALS NOT EXCEEDING 6 FEET) SHALL BE FOLLOWED PER NEC ART. 330.
14. ELECTRICAL CONTRACTOR TO PROVIDE JUNCTION BOX AND CONDUIT STUB-UP ABOVE CEILING FOR ALL LOW VOLTAGE CABLING.
15. DIMENSION IS FROM FINISHED WALL, SEE ARCHITECTURAL FOR WALL THICKNESS.
16. FIELD COORDINATE EXACT LOCATION OF OUTLETS AS DETERMINED BY THE ACTUAL FURNITURE LAY OUT. VERIFY WITH FIXTURE PLAN.
17. COORDINATE WITH OTHER DISCIPLINES FOR ELECTRICAL REQUIREMENTS OF EQUIPMENT NOT SHOWN ON DETAILS (i.e. ROOF-TOP UNITS, UNIT HEATERS, FANS, ETC.).
18. EC SHALL VERIFY IN FIELD ALL KITCHEN EQUIPMENT CONNECTIONS AND REQUIREMENTS PRIOR TO ROUGH-IN AND INSTALLATION OF DEVICES. VERIFY ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH FOOD SERVICE CONTRACTOR. EC SHALL MAKE ADJUSTMENTS IN FIELD TO MATCH ACTUAL EQUIPMENT BEING INSTALLED, AS DIRECTED BY THE FOOD SERVICE CONTRACTOR.
19. CONTRACTOR IS REQUIRED TO INSTALL STANDARD RECEPTACLES FOR CIRCUITS DEDICATED TO SPECIFIC EQUIPMENT. SUBJECT TO THE APPROVAL OF CODE ENFORCING AGENCY.
20. ALL 125-VOLT THROUGH 250-VOLT RECEPTACLES SUPPLIED BY SINGLE-PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 50 AMPERES OR LESS, AND ALL RECEPTACLES SUPPLIED BY THREE-PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 100 AMPERES OR LESS, INSTALLED IN THE LOCATIONS SPECIFIED IN 210.8(B)(1) THROUGH (B)(12) SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL.
21. SERVICE CONDUCTORS ARE DESIGNED BASED ON THE SERVICE DISTANCE OF 100' TO MEET THE 2% VOLTAGE DROP PER NEC.
    IF SERVICE CONDUCTOR IS BETWEEN:
    100 TO 150' E.C. SHALL INCREASE THE CONDUCTOR BY ONE SIZE(S) LARGER THAN DESIGN
    150' TO 200 E.C. SHALL INCREASE THE CONDUCTOR BY TWO SIZE(S) LARGER THAN DESIGN
    200 TO 250 E.C. SHALL INCREASE THE CONDUCTOR BY THREE SIZE(S) LARGER THAN DESIGN
22. BRANCH CONDUCTORS ARE DESIGNED BASED ON A DISTANCE OF 100' TO MEET THE 3% VOLTAGE DROP PER NEC.
    IF BRANCH CONDUCTOR IS BETWEEN:
    100' TO 150' E.C. SHALL INCREASE THE CONDUCTOR BY ONE SIZE(S) LARGER THAN DESIGN
    150' TO 200' E.C. SHALL INCREASE THE CONDUCTOR BY TWO SIZE(S) LARGER THAN DESIGN
    200 TO 250'-E.C. SHALL INCREASE THE CONDUCTOR BY THREE SIZE(S) LARGER THAN DESIGN
23. E.C. IS TO VERIFY WITH LOCAL AHJ FOR REQUIREMENT OF EXTERIOR EMERGENCY EGRESS LIGHTING AND ADJUST BID TO INCORPORATE AS NEEDED.
24. A.I.C OF PANELS AND SERVICE ENTRANCE EQUIPMENT IS BASED ON TYPICAL TRANSFORMER SPECIFICATIONS. CONTRACTOR SHALL FIELD VERIFY EXACT UTILITY A.I.C RATING AND MAKE EQUIPMENT ADJUSTMENTS AS REQUIRED IN THE FIELD AT NO EXTRA COST TO OWNER. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY FIELD CHANGES BASED ON UTILITY EQUIPMENT DATA.

LEGENDS: (NOT ALL SYMBOLS ARE USED WITHIN THIS SET OF DRAWINGS)

LIGHTING
- EXIT LIGHT (HATCHING DENOTES FACE)
- SURFACE MOUNTED OR RECESSED EMERGENCY LIGHTING FIXTURE
- S_P SWITCH (P) PILOT LIGHT (R) ROTARY SWITCH
- S_M MOTOR RATED SWITCH
- S_X TOGGLE SWITCH (X) DENOTES CONTROL LABEL
- S_{OS} OCCUPANCY SENSOR SWITCH
- PC PHOTOCELL OR DAYLIGHT SENSOR
- TC TIMECLOCK

POWER
- SINGLE RECEPTACLE
- DUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE
- CL CEILING MOUNTED RECEPTACLE
- GFI DUPLEX RECEPTACLE
- SPECIAL PURPOSE RECEPTACLE (AS NOTED)
- IG ISOLATED GROUND RECEPTACLE
- TR TAMPER RESISTANT RECEPTACLE
- TELEPHONE OUTLET
- DATA OUTLET
- VOICE/DATA COMBINATION OUTLET
- J JUNCTION BOX
- M MOTOR, FAN, PUMP OR AIR CONDITIONING UNIT
- PANELBOARD
- FUSED DISCONNECT SWITCH, RATING AS NOTED.
- NON-FUSED DISCONNECT SWITCH, RATING AS NOTED.
- A 30A/240V NON FUSED DISCONNECT SWITCH.
- B 60A/240V NON FUSED DISCONNECT SWITCH.
- C 100A/240V NON FUSED DISCONNECT SWITCH.

FIRE ALARM
- P FIRE ALARM PULL STATION NOM. 42" A.F.F. PER ADA
- FIRE ALARM AUDIO/VISUAL STATION 80" A.F.F. PER ADA
- FIRE ALARM VISUAL STATION 80" A.F.F. PER ADA
- FIRE ALARM AUDIO STATION 80" A.F.F. PER ADA
- RI REMOTE INDICATOR LIGHT/TEST SWITCH FOR DUCT SMOKE DETECTORS
- S DUCT SMOKE DETECTOR WITH REMOTE INDICATOR LIGHTS AND TEST SWITCH
- SD SMOKE DETECTOR
- FS FLOW SWITCH
- TS TAMPER SWITCH
- FACP FIRE ALARM CONTROL PANEL
- FIRE ALARM ANNUNCIATOR PANEL

ABBREVIATIONS

WP	WEATHERPROOF
AFF	ABOVE FINISHED FLOOR
UNO	UNLESS NOTED OTHERWISE
GFI	GROUND FAULT INTERRUPT
O.C	ON CENTER
ETR	EXISTING TO REMAIN
(E)	EXISTING TO REMAIN
VIF	VERIFY IN FIELD

STANDARD MOUNTING HEIGHTS

A.F.F (IN.)	DESCRIPTION
84"	AUDIBLE APPLIANCES
48"	ALARMS
48"	ANNUNCIATOR PANELS
84"	CLOCK OUTLETS (CENTERLINE)
48"	CONTROLS (CENTERLINE)
80"	EXIT SIGNS (WALL MOUNTED, BOTTOM)
60"	FIRE ALARM ANNUNCIATOR PANEL (DISPLAY)
120"	FIRE ALARM BELL (EXTERIOR)
60"	FIRE ALARM CONTROL PANEL/UNIT (DISPLAY)
36"	INTERCOM (AREA ONLY)
48"	INTERCOMS
72"	PANELS/PANELBOARDS (TOP)
48"	PULL STATIONS (TOP OF BOX)
144"	PHOTOCELLS
18"	RECEPTACLES (CENTERLINE)
24"	RECEPTACLES (EXTERIOR)
26"	RECEPTACLES (GARAGES)
48"	RECEPTACLES IN EQUIPMENT ROOMS
48"	REMOTE INDICATING LIGHT (EQUIPMENT ROOMS)
CEILING	REMOTE INDICATING LIGHT (FINISHED AREAS)
48"	SAFETY SWITCHES
48"	STARTERS
48"	SWITCHES (TOP OF BOX)
1@48" 1@36"	TELEPHONES (PUBLIC)
18"	TELEPHONE DATA OUTLETS (CENTERLINE)
6"	TELEPHONE TERMINAL BOARD (BOTTOM)
18"	TELEVISION OUTLETS
84"	VISIBLE APPLIANCES (CENTERLINE)

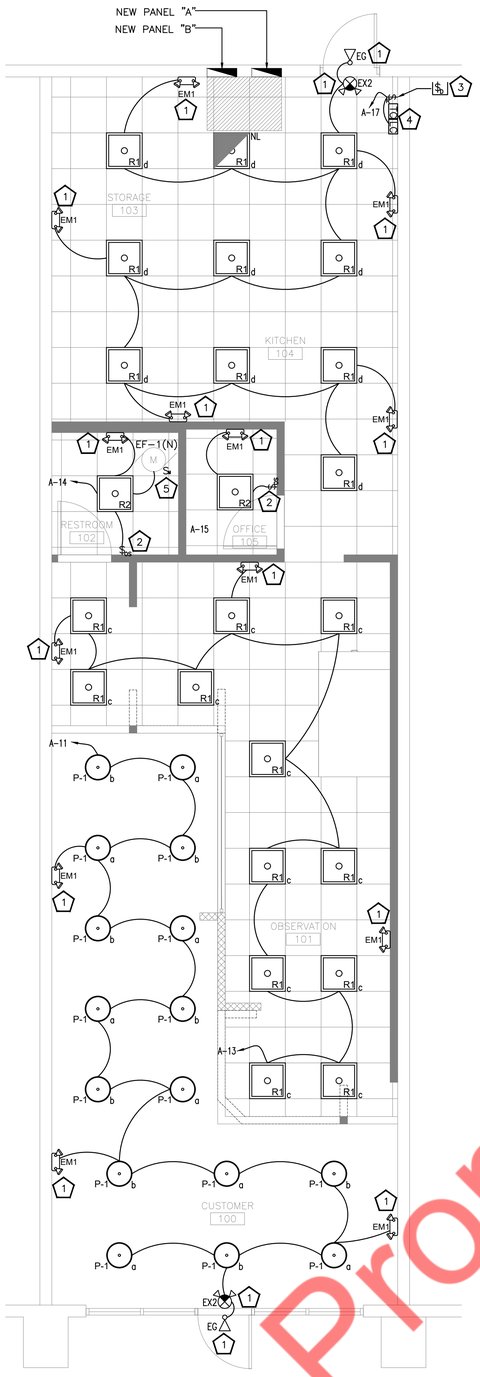
3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E001
ELECTRICAL GENERAL INFORMATION & SPECS

CHECKED: NYE DRAWN: NYE



1 ELCTRICAL LIGHTING PLAN
SCALE: 1/4" = 1'-0"

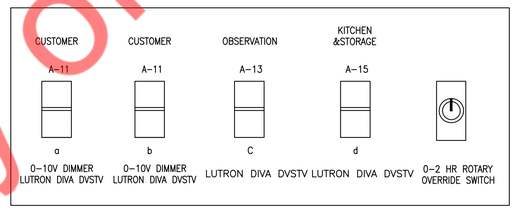
NORTH

LIGHTING FIXTURE SCHEDULE

Fixture Type	MANUFACTURER AND CATALOG NUMBER	MOUNTING	LAMP TYPE	QUANTITY	VOLTS	REMARKS	WATTAGE
R1	LITELINE EDGE 22 120	RECESSED LIGHTING	LED 3500K	22	120	2'X2' LED EDGE TROFFER WITH SHATTER-RESISTANT LENS	30W
R2	CREE ZR24 40L 835K SQ UC 10V5 4000LUMENS 3500K SQ 120V W/0-10V DIM	ACT LAY-IN	LED 3500K	2	120	RECESSED 2X2 LED DOWNLIGHT (FOOD SAFE) 0-10V DIMMING	27W ⚠1
P-1	BOCK P273-SN518-LED (48" STEM)	PENDANT	LVFV1-BRIDGELUX LED	16	120	640-50 STEM MOUNTED, 48IN STEM, 1/2-NPT	10W
EM1	LITHONIA LIGHTING ELM2L-M12	WALL 8'-0" AFF	LED	13	120	EMERGENCY LIGHT UNIT WITH 2 LED LAMP HEADS WITH INTEGRAL NI-CAD BATTERY AND SELF DIAGNOSTICS.	2.4W
EX2	LITHONIA LIGHTING LHQM-LED-R-HO-RO	WALL 7'-6" AFF OR 6" ABOVE DOOR	LED	2	120	EMERGENCY LIGHT UNIT WITH 2 LED LAMP HEADS, WITH INTEGRAL NI-CAD BATTERY WITH 6W REMOTE CAPACITY AND SELF DIAGNOSTICS.	1.5W
EG	LITHONIA, ELA QWP, REMOTE HEAD	WALL 7'-6" AFF OR 6" ABOVE DOOR	LED	2	120	EXTERIOR EMERGENCY LIGHT	3W

LIGHTING FIXTURE NOTES: 1. BIDS SHALL BE BASED ON THE LIGHTING FIXTURE SCHEDULE AND SPECIFICATIONS. REFER TO THE ELECTRICAL SPECIFICATIONS FOR ADDITIONAL INFORMATION. 2. ALL FIXTURES SHALL BE UL LISTED. 3. PROVIDE ALL NECESSARY MOUNTING HARDWARE, HANGERS, BRACKETS, RAILS, YOKES, CHAINS, ETC. 4. REFER TO ARCHITECTURAL DRAWINGS FOR SPECIFIC DETAILS, ARRANGEMENT, MOUNTING HEIGHTS, CEILING CONSTRUCTION, ETC. ALL COLORS AND FINISHES SHALL BE VERIFIED BY THE ARCHITECT. 5. FIXTURES SHALL BE SEISMICALLY SUPPORTED IF REQUIRED BY BUILDING CODE. 6. WIRE ALL BATTERY PACK UNITS (I. E. EXIT SIGNS AND EMERGENCY UNITS) AHEAD OF SWITCHING ON LOCAL LIGHTING BRANCH CIRCUIT.

CONTACT DUCK DONUTS NATIONAL LIGHTING VENDOR FOR PRICING: ADRIAN BORROWS, FACILITY SOLUTIONS GROUP. NE REGIONAL OFFICE, 222 WASHINGTON STREET, PERTH AMBOY, NEW JERSEY 08861. TEL. 732-826-6100. EMAIL DUCKDONUTS@FSGI.COM. WWW.FSGI.COM



2 SWITCHBANK - SALES
SCALE: N.T.S.

ELECTRICAL LIGHTING PLAN KEYED NOTES:

1. CONNECT ALL EMERGENCY EGRESS LIGHTING AND EMERGENCY FIXTURES TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES.
2. OCCUPANCY SENSOR MANUAL ON, AUTO OFF. REFER TO DETAIL 1/E201 FOR ADDITIONAL INFORMATION.
3. REFER TO DETAIL 2/E101 FOR ADDITIONAL INFORMATION. COORDINATE SWITCH BANK EXACT LOCATION WITH ARCH/OWNER. SELECT DIMMER SWITCHES WITH INDICATOR LIGHTS.
4. PROVIDE 7-DAY PROGRAMMABLE TIMECLOCK WITH SKIP-A-DAY FEATURE AND 0-2HR ROTARY OVERRIDE SWITCH. REFER TO DETAIL 4/E201 AND 6/E201 FOR MORE INFORMATION.
5. CONNECT EXHAUST FAN TO LOCAL LIGHTING CIRCUIT AND INTERLOCK WITH RESTROOM LIGHT SWITCH.

ELECTRICAL LIGHTING PLAN GENERAL NOTES:

1. 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.
2. 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.
3. VERIFY FINAL LUMINARIE LOCATIONS WITH OTHER CEILING MOUNTED EQUIPMENTS SUCH AS DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLANS.
4. VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF ALL WALL MOUNTED LUMINAIRE WITH ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO ROUGH-IN.
5. OCCUPANCY SENSORS SHALL BE PROVIDED AS SHOWN AND ALSO CONSIDER POWER PACKS AS REQUIRED IN COORDINATION WITH LIGHTING VENDOR.
6. THE SCOPE OF THE WORK COVERED BY THESE DRAWINGS AND SPECIFICATIONS INCLUDES LABOR, EQUIPMENT, AND MATERIALS FOR THE COMPLETE ELECTRICAL SYSTEM.
7. THE ENTIRE ELECTRICAL INSTALLATION SHALL COMPLY WITH THE NEC AND ALL STATE AND LOCAL CODES.
8. THE ENTIRE ELECTRICAL SYSTEM SHALL BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
9. EACH CONDUIT RUN SHALL HAVE A SEPARATE GROUND WIRE.
10. ALL BRANCH CIRCUITS SHALL HAVE SEPARATE NEUTRAL CONDUCTORS. SHARING OF NEUTRAL WIRES IS NOT ACCEPTABLE.
11. PROVIDE TYPED CIRCUIT DIRECTORY WITH CLEAR PROTECTIVE COVER/HOLDER INSIDE DOOR OF EVERY PANEL BOARD.
12. LIGHT FIXTURES INCLUDING ALL DECORATIVE LIGHT FIXTURES IN AREAS WHERE FOOD IS PREPARED, OPEN FOOD IS STORED OR DISPLAYED OR UTENSILS ARE CLEANED SHALL BE OF SHATTER PROOF CONSTRUCTION OR SHALL BE PROTECTED WITH SHATTERPROOF SHIELDS.

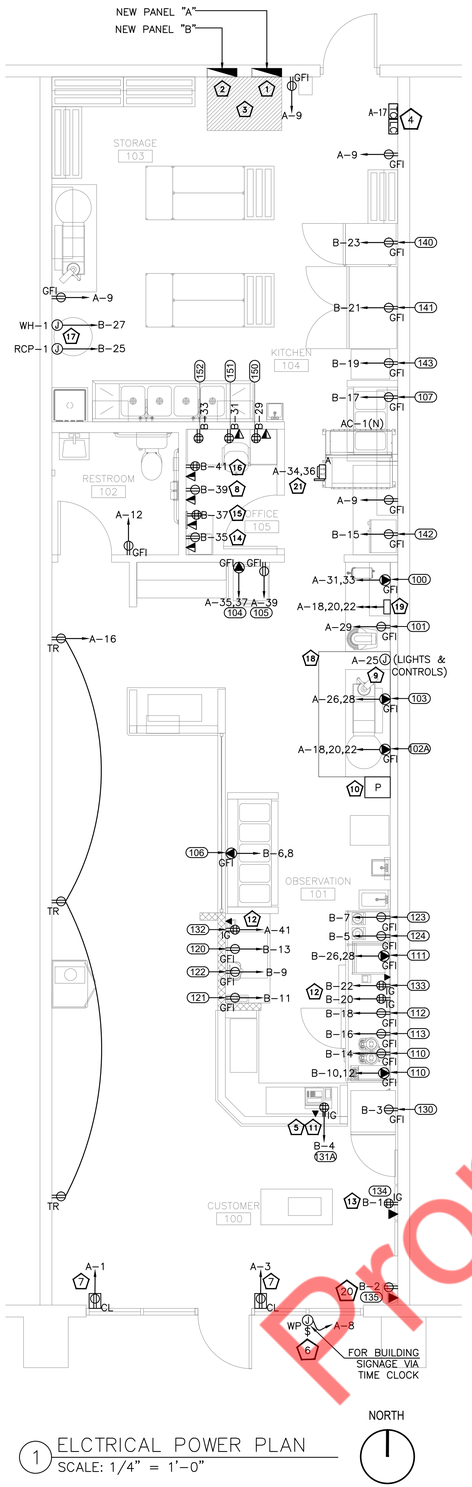
⚠1 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

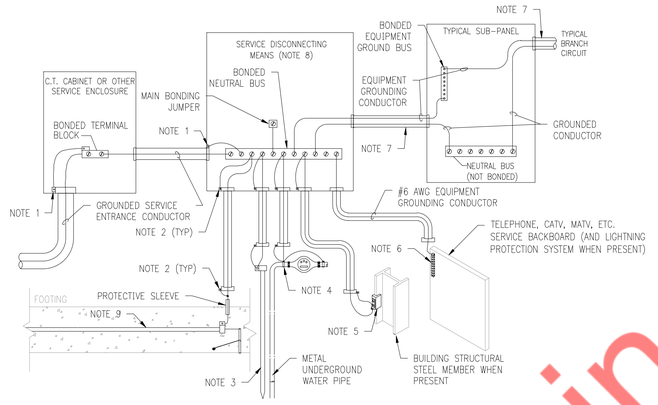
E101
ELECTRICAL LIGHTING PLAN

CHECKED: NYE DRAWN: NYE



1 ELCTRICAL POWER PLAN
SCALE: 1/4" = 1'-0"

NOTE: (PHASE CONDUCTORS NOT SHOWN)



2 MAIN SERVICE ENTRANCE GROUND CONNECTIONS
SCALE: N.T.S.

GROUNDING DETAIL NOTES:

1. ALL METAL CONDUITS ENCLOSING ANY SERVICE CONDUCTORS SHALL BE FITTED WITH A "BONDING BUSHING". SIZE THE JUMPER PER NEC.
2. ALL METAL CONDUITS ENCLOSING ANY GROUNDING ELECTRODE CONDUCTOR SHALL BE FITTED WITH A "BONDING BUSHING" AT EACH END. SIZE THE JUMPER PER NEC.
3. PROVIDE AT LEAST ONE SUPPLEMENTAL GROUNDING ELECTRODE PER NEC IN THE FORM OF A 10'-0" x 3/4" COPPER CLAD GROUND ROD INSTALLED PER CURRENT NEC REQUIREMENTS.
4. CONNECT TO THE BUILDING'S METAL UNDERGROUND WATER PIPE WITHIN 5'-0" OF ITS ENTRANCE INTO THE BUILDING AND JUMPER ANY WATER METER PER NEC REQUIREMENTS.
5. IF STRUCTURAL STEEL MEMBER IS AVAILABLE, BOND IT TO THE SERVICE USING A UL LISTED IRREVERSIBLE CLAMP OR WELDED LUG.
6. PROVIDE AN EQUIPMENT GROUND BAR AND ATTACH IT TO THE PHONE BOARD.
7. ALL BRANCH CIRCUIT AND FEEDER CONDUITS ARE TO HAVE AN INSULATED EQUIPMENT GROUNDING CONDUCTOR REGARDLESS OF THE CONDUIT MATERIAL.
8. WHEN THE SERVICE CONSISTS OF MULTIPLE DISCONNECTING MEANS IN SEPARATE ENCLOSURES, CONNECT A TAP CONDUCTOR FROM THE MAIN GROUNDING ELECTRODE CONDUCTOR TO EACH DISCONNECTING MEANS. SIZE THIS TAP BASED ON THE LARGEST SERVICE CONDUCTOR IN THAT SERVICE DISCONNECT ENCLOSURE.
9. PROVIDE A GROUNDING ELECTRODE ENCASED IN AT LEAST 2" OF CONCRETE AND LOCATED NEAR THE BOTTOM OF A CONCRETE FOUNDATION OR FOOTING THAT IS IN DIRECT CONTACT WITH EARTH. GROUNDING ELECTRODE SHALL CONSIST OF AT LEAST 20'-0" OF ONE OR MORE BARE OR ZINC GALVANIZED OR OTHER ELECTRICALLY CONDUCTIVE COATED STEEL REINFORCING BARS OR RODS OF NOT LESS THAN 1/2" IN DIAMETER OR AT LEAST 20'-0" OF #4 AWG BARE COPPER CONDUCTOR.

POWER PLAN KEYED NOTES:

1. NEW 200A (MCB), 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A" SHALL REMAIN AND REUSE. E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
2. NEW 100A (MLO), 208Y/120V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B" AS SHOWN. E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
3. E.C. SHALL VERIFY THAT THE PANEL AREA IS UNOBSTRUCTED AND SHALL HAVE CLEARANCE AS PER 110.26(A)&(B)
4. PROVIDE TIMECLOCK. CIRCUIT AS SHOWN. COORDINATE LOCATION WITH OWNER. SEE DETAILS 4 ON E201.
5. PROVIDE RECESSED MOUNTED RECEPTACLES WITHIN MILLWORK FOR EQUIPMENT. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH ARCHITECT AND INTERIOR DESIGN DRAWINGS PRIOR TO BID, ROUGH-IN AND INSTALLATION.
6. PROVIDE EXTERIOR SIGN CIRCUIT, INCLUDING PHOTOCELL AND TIME CLOCK CONTROL. REFER TO DETAIL 4 ON SHEET E201 FOR MORE INFORMATION. E.C. SHALL COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT/LANDLORD.
7. PROVIDE CEILING MOUNTED RECEPTACLE FOR SHOW WINDOW AS REQUIRED BY STATE SPECIFIC CODE. VERIFY WITH LOCAL AGENCY.
8. PROVIDE DUPLEX RECEPTACLE WITH DATA CONNECTION FOR BACK OFFICE DESK. MOUNT RECEPTACLE AND DATA OUTLET AT 36" AFF.
9. COORDINATE EXACT LOCATION AND REQUIREMENTS OF HOOD CONTROL PANEL, EXHAUST, AND MAKE-UP AIR FANS WITH OWNER AND HOOD PROVIDER PRIOR TO ROUGH-IN. COORDINATE HOOD CONNECTION LOCATIONS AND INTERCONNECTIONS WITH MANUFACTURERS INSTALLATION INSTRUCTIONS AND HOOD PROVIDER PRIOR TO ROUGH-IN. PROVIDE DATA PORT ADJACENT TO CONTROL PANEL. COOKING EQUIPMENT UNDER HOOD SHALL HAVE SHUNT TRIP BREAKERS THAT ARE TO BE CONTROLLED BY THE HOOD CONTROL PANEL.
10. PROVIDE A MANUAL PULL STATION FOR ANSUL SYSTEM. HOOD SUPPRESSION SYSTEM SHALL BE CONNECTED TO SECURITY SYSTEM. COORDINATE WITH SECURITY CONTRACTOR. REFER TO DETAIL 2 ON SHEET E201.
11. FOR EACH POS SYSTEM PROVIDE A DOUBLE DUPLEX RECEPTACLE WITH DATA CONNECTIONS BELOW THE COUNTERTOP.
12. FOR EACH POS PRINTER PROVIDE A DOUBLE DUPLEX RECEPTACLE WITH DATA CONNECTION.
13. WALL MOUNTED QUAD OUTLET FOR DIGITAL BOARDS. E.C TO COORDINATE LOCATION WITH FRANCHISING COMPANY AND DIGITAL BOARD LOCATION PRIOR TO INSTALLATION.
14. ASSEMBLE AND INSTALL NETWORK CABINET. BOTTOM OF NETWORK CABINET TO BE MOUNTED 36" BELOW FINISHED CEILING. PROVIDE A QUAD RECEPTACLE FOR NETWORK CABINET MOUNTED 6" BELOW THE NETWORK CABINET. INSTALL NETWORK/LOW-VOLTAGE PATCH PANEL INSIDE, AT TOP OF NETWORK CABINET. TERMINATE NETWORK/LOW-VOLTAGE CABLE (CAT6 ETHERNET CABLE) AT PATCH PANEL. SEE WIRING DIAGRAM ON SHEET E201. PROVIDE (4) CAT6 CABLES FROM PATCH PANEL TO POS SYSTEM (REGISTER COUNTER). PROVIDE (1) CAT6 CABLE FROM PATCH PANEL TO POS TICKET PRINTER AT TOPPINGS LOCATION. PROVIDE (1) CAT6 CABLE FROM PATCH PANEL TO BACK OF HOUSE POS TICKET PRINTER. PROVIDE (1) CAT 6 FROM PATCH PANEL TO BACK OFFICE COMPUTER. PROVIDE (8) CAT6 CABLES FROM PATCH PANEL FOR SECURITY CAMERAS LOCATED THROUGHOUT THE SPACE. COORDINATE SECURITY CAMERA LOCATIONS WITH ARCHITECT/PROJECT MANAGER. TERMINATE ALL CABLES AT PUNCH DOWN PATCH PANEL AS NOTED ON WIRING DIAGRAM ON SHEET E201. PROVIDE DATA JACKS AND/OR WALL PLATES WHERE NEEDED. PROVIDE 14 GAUGE SPEAKER WIRE, RUN WIRE TO NETWORK CABINET. COORDINATE SPEAKER LOCATIONS WITH ARCHITECT/PROJECT MANAGER. SECURITY CAMERAS AND SPEAKERS TO BE PROVIDED BY FRANCHISEE, GC TO COORDINATE INSTALLATION. CAT5E WIRE CAN BE USED IN LIEU OF SPECIFIED CAT6 WIRE.
15. RECEPTACLE FOR SECURITY PANEL, COORDINATE LOCATION AND ELECTRICAL REQUIREMENTS WITH EQUIPMENT SUPPLIER.
16. RECEPTACLE FOR TELEPHONE BACK BOARD, COORDINATE LOCATION WITH OWNER/ARCHITECT AND ELECTRICAL REQUIREMENTS WITH SERVICE PROVIDER.
17. E.C SHALL COORDINATE WITH PLUMBING CONTRACTOR AND PROVIDE POWER CONNECTIONS FOR RECIRCULATION PUMP AND WATER HEATER. BASE BID ACCORDINGLY.
18. E.C SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR THE HVAC EQUIPMENT. E.C. SHALL COORDINATE FOR THE LOCATION OF SWITCHING CONTROLS AND PROVIDE ALL NECESSARY WIRING REQUIRED. BASE BID ACCORDINGLY.
19. PROVIDE A 30A/3P 208V SHOCK BLOCK LITTLE FUSE PROTECTOR. MODEL SB5032-021-0.
20. E.C. SHALL COORDINATE WITH OWNER/ARCHITECT FOR EXACT LOCATION, MOUNTING AND POWER REQUIREMENT FOR KIOSK. BASE BID ACCORDINGLY.
21. PROVIDE 15A/2P, NEMA 3R, DISCONNECT FOR AC-1(N) PER MANUFACTURER NAMEPLATE. REFER TO HOOD CONTROL WIRING DIAGRAM FOR ADDITIONAL INFORMATION.

VERIFY IN FIELD ALL KITCHEN EQUIPMENT CONNECTIONS AND REQUIREMENTS PRIOR TO ROUGH-IN AND INSTALLATION OF DEVICES. VERIFY ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH FOOD SERVICE CONTRACTOR. EC SHALL MAKE ADJUSTMENTS IN FIELD TO MATCH ACTUAL EQUIPMENT BEING INSTALLED, AS DIRECTED BY THE FOOD SERVICE CONTRACTOR.

PROVIDE STANDARD RECEPTACLES FOR CIRCUITS DEDICATED TO SPECIFIC EQUIPMENT. SUBJECT TO THE APPROVAL OF CODE ENFORCING AGENCY.

ELECTRICAL CONTRACTOR SHALL PROVIDE TAMPER RESISTANT RECEPTACLES AS PER NEC SECTION 406.12.

ELECTRICAL CONTRACTOR SHALL PROVIDE IG RECEPTACLES AS REQUIRED.

ALL 125-VOLT THROUGH 250-VOLT RECEPTACLES SUPPLIED BY SINGLE-PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 50 AMPERES OR LESS, AND ALL RECEPTACLES SUPPLIED BY THREE-PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 100 AMPERES OR LESS, INSTALLED IN THE LOCATIONS SPECIFIED IN 210.8(B)(1) THROUGH (B)(12) SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL.

NOTE THAT THE ISOLATED GROUNDING TYPE RECEPTACLES AND CLOCK TYPE RECEPTACLES LOCATED IN THE KITCHEN/SERVING AREA SHALL BE PROTECTED BY GROUND FAULT TYPE CIRCUIT BREAKERS RATHER THAN GROUND FAULT TYPE RECEPTACLES SINCE THESE RECEPTACLES ARE NOT AVAILABLE AS GROUND-FAULT TYPE RECEPTACLES. GFCI BREAKERS REQUIRE A DEDICATED NEUTRAL (NOT SHARED) TO OPERATE PROPERLY.

FIXTURE / EQUIPMENT SCHEDULE

ITEM #	QTY.	DECSRIPTION	VOLTS	HP	AMPS	Kva	BREAKER	RECT. HEIGHT CENTERLINE	PLUG	NOTES
FOOD SERVICE										
100	1	WATER DISP. w/ DISPLAY	208		19.5	4.05	25	38"		REQUIRED 1/4" FILTERED WATER CONNECTION
101	1	COUNTERTOP MIXER	115		5	0.58	20	38"		
102A	1	ROBOTIC DOUGHNUT MAKER	208/240-3P		20.3	7.31	30	38"	L15-30P	SHUNT TRIP OR CONTACTOR/RELAY W/EXHAUST HOOD
102B	1	SPARE ROBOTIC DOUGHNUT MAKER								INCLUDE COVER FOR STORAGE
103	1	SHORTENING MELTER (FOR FRYER)	208-240		8.7	1.8	15	18"	L6-20P	
104	1	SANDWICH OVEN	208-240		23	4.78	30	38"	6-30P	
105	1	CHEF BASE REFRIGERATOR	115		2	0.23	20	38"		
106	1	5 WELL STEAM TABLE	208-240		16.6	3.45	30	18"	6-30P	PROVIDE W/ SPEED RAILS
107	1	3 WELL STEAM TABLE	120		12	1.44	15	18"	5-15P	PROVIDE W/ SPEED RAILS
COFFEE										
110	1	SINGLE COFFEE BREWER	208-240		14	2.9	(2) 20	under cab.	J-BOX	REQUIRES ADDITIONAL 120V RECEPTACLE & 3/8" FCW
111	1	ESPRESSO MACHINE	208-240		14	2.91	20	under cab.	6-20P	REQUIRES 3/8" FILTERED WATER CONNECTION
112	1	ICE MAKER - UNDERCOUNTER	115		5	0.58	20	18"		REQUIRES 3/8" FILTERED WATER CONNECTION
113	1	RERIGERATOR - UNDERCOUNTER	120	1/6	1.1	0.33	20	18"		
ICE CREAM										
120	1	ICE CREAM FREEZER	115		1.3	0.15	15	18"		#12 WIRE
121	1	ELECTRIC HEATED DIPPER WELL	120		3	0.33	20	38"		
122	1	SHAKE / DRINK MIXER - 3 SPINDLE	120		8	0.9	20	38"		
123	1	HIGH POWER BLENDER	115		13	1.56	20	38"		
124	1	HIGH POWER BLENDER	115		13	1.56	20	38"		
POS										
130	1	BEVERAGE COOLER W/ GLASS DOOR	115	1/3	3	0.33	20	18"		#12 WIRE
131A	1	POS SYSTEM W/ MONITOR	120		6	0.72	20	under cab.		
131B	1	UNDERCOUNTER CASH DRAWER MOUNT								
132	1	POS REMOTE PRINTER #1	120		3	0.1	20	38"		
133	1	POS REMOTE PRINTER #2	120		3	0.1	20	38"		
134	1	MENUBOARD W/(3) 43" DIGITAL PANELS	120		1	0.2	20	96"		
135	1	SELF ORDER KIOSK	120		1	0.13	20	18"		
PREP AREA										
140	1	FREEZER - 1 DOOR REACH-IN	115	1/2	4	0.46	15	18"		#12 WIRE
141	1	REFRIGERATOR - 2 DOOR REACH-IN	115	1/5	1.9	0.36	20	18"		
142	1	MICROWAVE ON SHELF	120		13	1.56	15	38"		#12 WIRE
143	1	FUTURE WARMING CABINET	120		12	1.44	20	18"		
MANAGER'S DESK										
150	1	I.T. RACK	120		9	1.08	20	96"		
151	1	PERSONAL COMPUTER	120		14	1.68	20	18"		
152		I.T. CAMERA / SECURITY RECEPTACLE	120		8	0.96	20	36"		

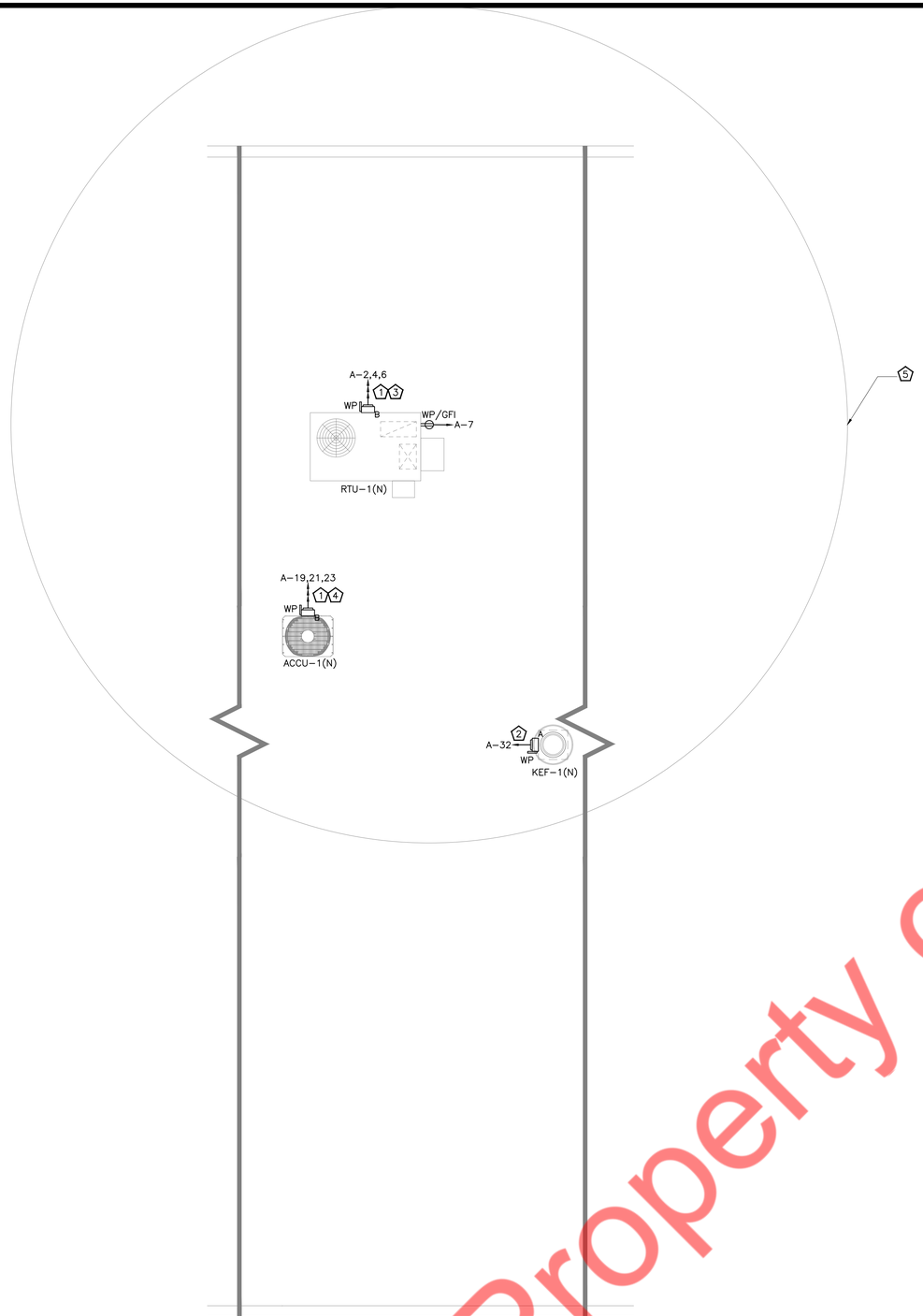
3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E102
ELECTRICAL POWER PLAN

CHECKED: NYE DRAWN: NYE



1 ELCTRICAL ROOF POWER PLAN
SCALE: 1/4" = 1'-0"

NORTH

ROOF PLAN GENERAL NOTES:

1. E.C SHALL COORDINATE WITH MECHANICAL CONTACTOR FOR EXACT LOCATION OF THE HVAC EQUIPMENT.
2. E.C. SHALL PROVIDE THE DISCONNECT AND ALL NECESSARY WIRING REQUIRED FOR HVAC EQUIPMENTS IN COORDINATION WITH MECHANICAL CONTACTOR AND EQUIPMENT MANUFACTURER. BASE BID ACCORDINGLY.

(#) ROOF PLAN KEYED NOTES:

1. PROVIDE CONNECTION AND CIRCUIT TO FACTORY SUPPLIED POWER "WHIP" SEE CONNECTION DETAIL M-405. PROVIDE OTHER CONNECTIONS INDICATED ON DETAILS.
2. PROVIDE 20A/1P, NEMA 3R, DISCONNECT FOR KEF-1(N) PER MANUFACTURER NAMEPLATE. REFER TO HOOD CONTROL WIRING DIAGRAM FOR ADDITIONAL INFORMATION.
3. PROVIDE 50A/3P, NEMA 3R DISCONNECT SWITCH FOR RTU-1(N). FUSE PER MANUFACTURER NAMEPLATE. REFER TO HOOD CONTROL WIRING DIAGRAM FOR ADDITIONAL INFORMATION.
4. PROVIDE 45A/3P, NEMA 3R DISCONNECT SWITCH FOR ACCU-1(N). FUSE PER MANUFACTURER NAMEPLATE.
5. RADIUS TO SHOW CODE REQUIRED WP/GFI MAINTENANCE RECEPTACLE WITHIN 25' OF ROOF TOP EQUIPMENT.

NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E103
ELECTRICAL ROOF PLAN

CHECKED: NYE DRAWN: NYE

(NEW) Panelboard A

208Y/120V, 3 Phase, 4 Wire, 200A MAIC RATING: 22kA

BRANCH CIRCUIT							LOADING (VA)				BRANCH CIRCUIT						
NOTES	CKT	DESCRIPTION	TYPE	PH	WIRE	BRK	KVA	A PHASE	B PHASE	C PHASE	KVA	BRK	WIRE	PH	TYPE	DESCRIPTION	CKT	NOTES
3	1	STOREFRONT RECEPTACLES (PER NEC)	1	1	#12	20	1.18	5.21			4.02	50	#8	3	4	RTU-1 (N)	2	
3	3	STOREFRONT RECEPTACLES (PER NEC)	1	1	#12	20	1.18		5.21		4.02				4		4	
	5	SPARE		1		20				4.02	4.02				4		6	
	7	ROOF UTILITY CIRCUIT	2	1	#12	20	0.18	0.68			0.50	20	#12	1	1	BUILDING SIGN	8	3
	9	UTILITY CIRCUIT	2	1	#12	20	0.72		0.72			20		1		SPARE	10	
3	11	LIGHTING CUSTOMER AREA	1	1	#12	20	0.16			0.34	0.18	20	#12	1	2	RESTROOM GFCI (PER NEC)	12	
3	13	LIGHTING OBSERVATION AREA	1	1	#12	20	0.36	0.56			0.20	20	#12	1	1	RESTROOM EXHAUST FAN & LIGHTING	14	
3	15	LIGHTING KITCHEN & STORAGE, OFFICE	1	1	#12	20	0.33		0.87		0.54	20	#12	1	2	GENERAL RECEPTCALE	16	
	17	LIGHTING CONTACTOR AND TIME CLOCK	1	1	#12	20	0.50			3.02	2.52				3		18	
	19	ACCU-1 (N)	4				3.48	6.00			2.52	30	#10	3	3	(102A) ROBOTIC DOUGHNUT MAKER	20	4
	21		4	3	#8	45	3.48		6.00		2.52				3		22	
	23		4				3.48			3.48						SHUNT TRIP	24	5
	25	EXHAUST HOOD CONTROLS	3	1	#12	20	0.60	1.50			0.90	15	#12	1	3	(103) SHORTENING MELTER	26	4
	27	SPARE		1		20			0.90		0.90				3		28	
4	29	(101) COUNTERTOP MIXER	3	1	#12	20	0.58			0.58						SHUNT TRIP	30	5
4	31	(100) WATER DISP. FOR DONUT STATION	3	1	#10	25	2.03	2.48			0.45	20	#12	1	4	KEF-1 (N)	32	
	33		3				2.03		2.53		0.50	15	#12	1	4	AC-1 (N)	34	
4	35	(104) SANDWICH OVEN	3	1	#10	30	2.39			2.89	0.50				4		36	
	37		3				2.39	8.84			6.45						38	
4	39	(105) CHEF BASE REFRIGERATOR	3	1	#12	20	0.23		6.68		6.45	100	#3	3		PANEL B	40	
	41	(132) PRINTER	2	1	#12	20	0.10			6.55	6.45						42	
								25.27	22.91	20.88								
		TOTAL CONNECTED LOAD =								69.06 KVA								

ELECTRICAL LOAD SUMMARY:

LOAD TYPE	CONNECTED LOAD		MULTI	DEMAND LOAD
1.) LIGHTING	3.72	0.70	1.25	5.52
2.) RECEPTACLES	1.00	0.72	1	1.72
3.) KITCHEN EQUIP	10.25	9.36	0.65	12.75
4.) HVAC&REFRIG.	10.45	13.52	1	23.96
5.) CONTINUOUS MOTOR	0.00	0.00	1.25	0.00
6.) INTERMITEN MOTOR	0.00	0.00	0.85	0.00
PANEL A LOAD:		49.71 KVA		43.95 KVA
PANEL B LOAD:		25.53 KVA		19.34 KVA
TOTAL LOAD:		75.24 KVA		63.30 KVA
TOTAL AMPS @ 208v-3 PH.		209.1 AMPS		175.9 AMPS

T.C. - TIME CLOCK CONTROLLED
(IG) - ISOLATED GROUND
(SWD) LISTED & MARKED FOR SWITCHING USE
** - SEE SINGLE LINE DIAGRAM

(NEW) Panelboard B

208Y/120V, 3 Phase, 4 Wire 100 AMP MAIC RATING: 22kA

BRANCH CIRCUIT							LOADING (VA)				BRANCH CIRCUIT						
NOTES	CKT	DESCRIPTION	TYPE	PH	WIRE	BRK	KVA	A PHASE	B PHASE	C PHASE	KVA	BRK	WIRE	PH	TYPE	DESCRIPTION	CKT	NOTES
	1	(134) MENUBOARDS	1	1	#12	20	0.36	0.54			0.18	20	#12	1	2	(135) KIOSK	2	
	3	(130) BEVERAGE COOLER	4	1	#12	20	0.33		0.69		0.36	20	#12	1	2	(131) POS SYSTEM	4	
	5	(124) HIGH POWER BLENDER	3	1	#12	20	1.56			3.29	1.73	30	#10	1	3	(106) 5-WELL STEAM TABLE	6	4
	7	(123) HIGH POWER BLENDER	3	1	#12	20	1.56	3.29			1.73				3		8	
	9	(122) SHAKE MIXER	3	1	#12	20	0.90		2.35		1.45	20	#12	1	3	(110) SINGLE COFFEE BREWER	10	
	11	(121) ELECTRIC HEATED DIPPER WELL	3	1	#12	20	0.33			1.78	1.45				3		12	
1,4	13	(120) ICE CREAM FREEZER	3	1	#12	15	0.15	0.40			0.25	20	#12	1	3	(110) COFFEE ADDITIONAL RECEPTACLE	14	
	15	(142) MICROWAVE	3	1	#12	20	1.56		1.89		0.33	20	#12	1	3	(113) UNDERCOUNTER REFRIGERATOR	16	1,4
4	17	(107) 3-WELL STEAM TABLE	3	1	#12	20	1.44			2.02	0.58	20	#12	1	3	(112) ICE MAKER	18	1,4
	19	(143) FUTURE WARMING CABINET	2	1	#12	20	1.44	1.64			0.20	20	#12	1	2	ADDITIONAL COUNTERTOP RECEPTACLE	20	
4	21	(141) 2-DOOR REACH IN REFRIGERATOR	4	1	#12	20	0.36		0.54		0.18	20	#12	1	2	(133) PRINTER	22	
4	23	(140) 1-DOOR REACH IN FREEZER	4	1	#12	15	0.46			0.46						SPACE	24	
	25	RECIRCULATION PUMP (RCP-1)	4	1	#12	20	0.20	1.66			1.46	20	#12	1	3	(111) ESPRESSO MACHINE	26	4
	27	WATER HEATER (WH-1)	4	1	#12	20	0.20		1.66		1.46				3		28	
	29	(150) I.T. RACK	2	1	#12	20	0.65			0.65		20		1		SPARE	30	
	31	(151) PERSONAL COMPUTER	2	1	#12	20	1.10	1.10				20		1		SPARE	32	
	33	(152) I.T. CAMERA / SECURITY RECEPTACLE	2	1	#12	20	0.50		0.50			20		1		SPARE	34	
	35	RECEPT. PATCH PANEL	2	1	#12	20	0.18			0.18		20		1		SPARE	36	
	37	RECEPT. TELEPHONE BOARD	2	1	#12	20	0.36	0.36				20		1		SPARE	38	
	39	RECEPT. DESK	2	1	#12	20	0.18		0.18			20		1		SPARE	40	
	41	RECEPT. SECURITY	2	1	#12	20	0.36			0.36		20		1		SPARE	42	
								8.99	7.81	8.74								
		TOTAL CONNECTED LOAD =								25.53 KVA								

ELECTRICAL LOAD SUMMARY:

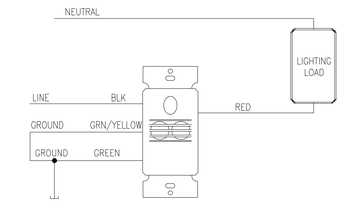
LOAD TYPE	CONNECTED LOAD	MULTI	DEMAND LOAD
1.) LIGHTING	0.36	1.25	0.45
2.) RECEPTACLES	5.69	1	5.69
3.) KITCHEN EQUIP	17.93	0.65	11.65
4.) HVAC&REFRIG.	1.55	1	1.55
5.) CONTINUOUS MOTOR	0.00	1.25	0.00
6.) INTERMITEN MOTOR	0.00	0.85	0.00
PANEL B LOAD:	25.53 KVA		19.34 KVA
TOTAL AMPS @ 208v-3 PH.	70.9 AMPS		53.8 AMPS

T.C. - TIME CLOCK CONTROLLED
(IG) - ISOLATED GROUND
(SWD) LISTED & MARKED FOR SWITCHING USE
** - SEE SINGLE LINE DIAGRAM

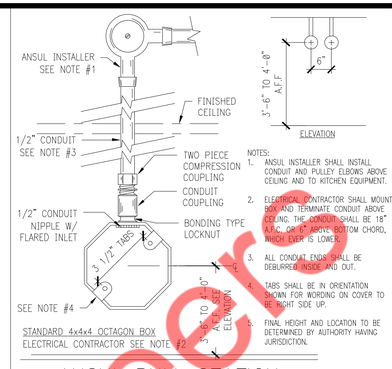
8 PANEL SCHEDULES
SCALE: N.T.S.

PANELBOARD NOTES:

1. PROVIDE HACR RATED BREAKER(S) FOR CIRCUIT.
2. PROVIDE LOCKABLE BREAKER(S) FOR CIRCUIT.
3. VIA CONTACTOR.
4. PROVIDE GFI RATED BREAKER(S) FOR CIRCUIT.
5. PROVIDE SHUNT TRIP BREAKER FOR CIRCUIT.

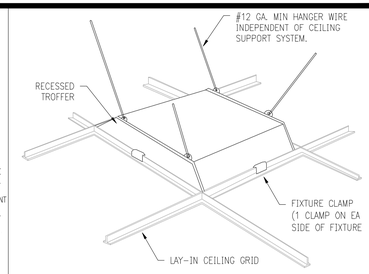


1 PIR WALL SWITCH SENSOR WATTSTOPPER PW-100
SCALE: N.T.S.



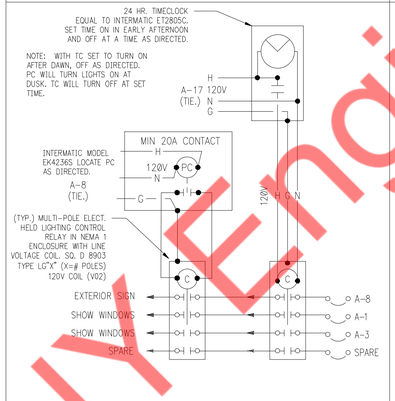
2 ANSUL PULL STATION
SCALE: N.T.S.

FOR REFERENCE ONLY

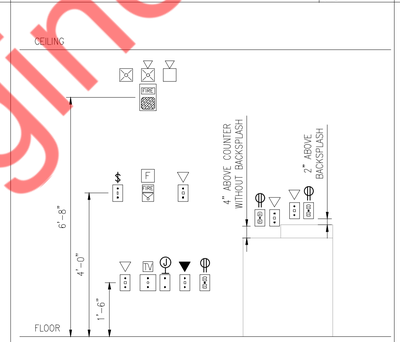


NOTE:
PROVIDE LIGHT FIXTURE SUPPORTS PER:
USG SEISMIC TECHNICAL GUIDE: LIGHT FIXTURE HANGER WIRE REQUIREMENTS
NEC 410.36
NEC 300.11

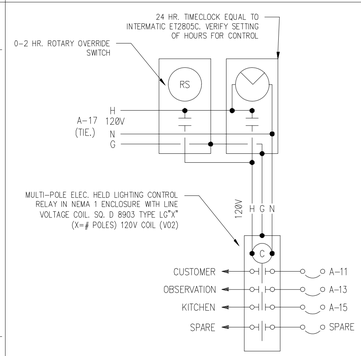
3 RECESSED FIXTURE MOUNTING
SCALE: N.T.S.



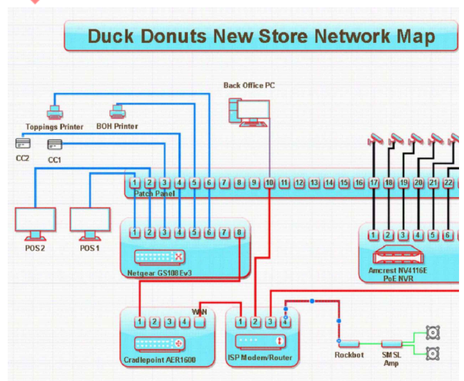
4 LIGHTING CONTACTOR DIAGRAM EXTER.
SCALE: N.T.S.



5 TYPICAL MOUNTING HEIGHTS
SCALE: N.T.S.



6 LIGHTING CONTACTOR DIAGRAM
SCALE: N.T.S.



7 NETWORK WIRING MAP
SCALE: N.T.S.

3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E201
ELECTRICAL DETAILS

CHECKED: NYE DRAWN: NYE

COM*check* Software Version COMcheckWeb

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2021 IECC
Project Title: Duck Donuts, Las Vegas, NV
Project Type: Alteration

Construction Site: Owner/Agent: Designer/Contractor:

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-Dining: Cafeteria/Fast Food	1409	0.76	1071
		Total Allowed Watts =	1071

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
Dining: Cafeteria/Fast Food (1409 sq.ft.)				
LED: R1: 2X2 LED EDGE TROFFER: Other:	1	22	30	660
LED: R2: RECESSED 2X2 LED DOWNLIGHT: Other:	1	2	27	54
LED: P-1: PENDANT: Other:	1	16	10	160
		Total Proposed Watts =		874

Interior Lighting PASSES

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting alteration project represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2021 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title Signature 03/25/2025 Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2021 IECC

Requirements: 100.0% were addressed directly in the COM*check* software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts; transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.3.1 [EL22][1]	Spaces required to have light-reduction controls have a manual control that allows the occupant to reduce the connected lighting load in a reasonably uniform illumination pattern >= 50 percent.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.2.1, C405.2.1.1 [EL18][1]	Occupancy sensors installed in classrooms/lecture/training rooms, conference/meeting/multipurpose rooms, copy/print rooms, lounges/breakrooms, enclosed offices, open plan office areas, restrooms, storage rooms, locker rooms, corridors, warehouse storage areas, and other spaces <= 300 sqft that are enclosed by floor-to-ceiling height partitions. Reference section language C405.2.1.2 for control function in warehouses and section C405.2.1.3 for open plan office spaces.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.2.1.2 [EL19][1]	Occupancy sensors control function in warehouses: In warehouses, the lighting in aisleways and open areas is controlled with occupant sensors that automatically reduce lighting power by 50% or more within 20 minutes of when the areas are unoccupied. The occupant sensors control lighting in each aisleway independently and do not control lighting beyond the aisleway being controlled by the sensor. Lights not turned off by occupant sensors is done so by time-switch.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.2.1.3 [EL20][1]	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office spaces >= 300 sq.ft. have controls 1) configured so that general lighting can be controlled separately in control zones with floor areas <= 600 sq.ft. within the space, 2) general lighting in each zone permitted to turn on upon occupancy in control zone, 3) automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the space, 4) are configured so that general lighting power in each control zone is reduced by >= 80% of the full zone general lighting power within 20 minutes of all occupants leaving that control zone.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.2.2, C405.2.2.1 [EL21][2]	Each area not served by occupancy sensors (per C405.2.1.1) have time-switch controls and functions detailed in sections C405.2.2.1.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.4, C405.2.4.1, C405.2.4.2 [EL23][2]	Daylight zones provided with individual controls that control the lights independent of general area lighting. See code section C405.2.3 Daylight-responsive controls for applicable spaces, C405.2.3.1 Daylight responsive control function and section C405.2.3.2 Sidelit zone.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.2.5 [EL27][1]	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.7 [EL26][2]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.8 [EL27][2]	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(4). Efficiency verified through certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.9.1, C405.9.2 [EL28][2]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.10 [EL29][2]	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C405.1.1 [EL30][2]	At least 90% of dwelling unit permanently installed lighting shall have lamp efficacy >= 65 lm/W or luminaires with efficacy >= 45 lm/W or comply with C405.2.4 or C405.3.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C405.11, C405.11.1 [EL31][2]	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and > 25% of branch circuit feeders for modular furniture will have automatic receptacle control in accordance with C405.11.1.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.2 [FI17][1]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.1.1 [FI57][1]	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.5 [FI16][1]	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.3 [FI33][1]	Lighting systems have been tested to ensure proper calibration, adjustment, programming, and operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E301
ENERGY CALCULATIONS

CHECKED: NYE DRAWN: NYE

DIVISION 26- ELECTRICAL SPECIFICATIONS

1. GENERAL INFORMATION

1.1. PROVIDE ALL SUPPLIES, MATERIAL, LABOR, EQUIPMENT, AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION AND FULL OPERATION OF ALL ELECTRICAL AND ELECTRICAL RELATED WORK, INDICATED HEREINAFTER ON DRAWINGS AND SPECIFICATIONS, FOR A SAFE AND FULLY OPERATIONAL SYSTEM.

1.1.1. THE INSTALLED SYSTEM SHALL BE COMPLETE IN EVERY WAY AND FUNCTIONING ACCORDING TO THE DESIGN INTENT, WHETHER OR NOT ALL SUCH MATERIALS AND APPURTENANCES ARE SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.

1.2. PERFORM ALL OPERATIONS INCLUDING EXCAVATION & BACKFILLING, SHORING, CUTTING, CHANNELING & CHASING, DE-WATERING, ETC. NECESSARY FOR INSTALLATION OF FULLY OPERATIONAL SYSTEM, WHETHER OR NOT SHOWN ON THE DRAWINGS.

1.3. DEFINITION OF TERMS

1.3.1. FURNISH – SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS.

1.3.2. INSTALL – OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS.

1.3.3. PROVIDE – FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.

1.3.4. U.N.O. – UNLESS NOTED OTHERWISE.

1.3.5. M.S.D.S. – MATERIAL SAFETY DATA SHEET

1.3.6. CONTRACTOR – APPEARANCE ON DRAWINGS OR IN SPECIFICATIONS FOR ELECTRICAL WORK SHALL REFER TO ELECTRICAL SUB-CONTRACTOR.

1.3.7. RELOCATE – DISCONNECT ELECTRICAL FEEDER, MAKE SAFE (INCLUDING LOCK OUT/TAG OUT), STORE AND PROTECT DEVICE, REINSTALL, REWORK AND EXTEND CONDUIT & WIRE TO NEW LOCATION, RE-ENERGIZE AND TEST.

1.3.8. EQUAL AND EQUIVALENT – TO MEAN OF THE SAME QUALITY, SIZE, NUMBER, VALUE, DEGREE, INTENSITY AND THE ITEMS ARE SIMILAR IN ALL RESPECTS.

1.3.8.1. THE FINAL DECISION OF ACCEPTANCE OF THESE ITEMS WILL BE MADE BY THE ENGINEER.

1.3.8.2. IT SHALL BE UNDERSTOOD THAT FOR ANY SPECIFIED ITEM ON THE DRAWINGS AND/OR IN THE SPECIFICATION, THIS TERM SHALL APPLY.

1.4. ALL WORK SHALL BE PERFORMED UNDER THE PERSONAL SUPERVISION OF A PROJECT SUPERINTENDENT ON-SITE. MAINTAIN A COMPLETE SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES DURING THE PROJECT.

1.5. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SUITABLE FOR THE CONDITIONS AND DUTIES IMPOSED ON THEM AFTER INSTALLATION.

1.5.1. ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL BEAR THE SEAL OF UNDERWRITERS LABORATORIES INC. (UL), OR A SIMILAR CREDIBLE TESTING AGENCY, LABEL WHERE REGULARLY SUPPLIED.

1.5.2. CERTAIN MANUFACTURERS OF MATERIAL AND EQUIPMENT ARE SPECIFIED AND PLANS ARE DETAILED ACCORDING TO THIS MATERIAL. CONTRACTOR SHALL BASE BID ON FURNISHING AND INSTALLING THIS MAKE OF MATERIAL AND EQUIPMENT.

1.6. ALL MATERIALS SHALL BE FABRICATED AND INSTALLED IN A NEAT AND WORKMANLIKE MANNER.

1.6.1. THE OWNER AND ENGINEER SHALL DETERMINE WHETHER WORKMANSHIP IS ACCEPTABLE. NO ALLOWANCES WILL BE MADE FOR REWORK OR DELAY DUE TO POOR WORKMANSHIP, COORDINATION DIFFICULTIES, OR INTERFERENCES BETWEEN INVOLVED TRADES.

1.6.2. PERFORM ALL WORK NECESSARY TO PREPARE THE STRUCTURE FOR THE INSTALLATION OF THE WORK. ALL HOLES, OPENINGS AND DAMAGED MATERIALS CREATED DURING CONSTRUCTION SHALL BE REPAIRED AND FINISHED BY EXPERIENCED WORKMEN.

1.6.3. COORDINATE AND SCHEDULE THE WORK WITH THE OWNER TO MINIMIZE DISRUPTIONS TO THE NORMAL OPERATIONS AT THE BUILDING.

1.6.3.1. INCLUDE IN THE CONTRACT PRICE THE COST OF AFTER-HOURS WORK AND TEMPORARY PROVISIONS TO MINIMIZE DOWN TIME AND TO MAINTAIN FACILITY IN OPERATING CONDITION. COORDINATE WITH THE OWNER TO DETERMINE THE EXTENT OF THESE REQUIREMENTS PRIOR TO BID.

1.7. RELATED WORK SPECIFIED ELSEWHERE:

1.7.1. ALL DIVISION 1 REQUIREMENT, AND ALL TERMS AND CONDITIONS OF CONTRACT.

1.7.2. REFER TO MECHANICAL SPECIFICATION FOR MECHANICAL WORK TO BE DONE IN CONJUNCTION WITH THE ELECTRICAL WORK. CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT, WIRING, JUNCTION BOXES, ETC., REQUIRED FOR HVAC CONTROLS, UNLESS SPECIFICALLY NOTED OTHERWISE.

1.7.3. ALL ELECTRICAL EQUIPMENT AND WIRING PROVIDED UNDER DIVISION 23 SHALL COMPLY WITH THE ELECTRICAL SYSTEM CHARACTERISTICS INDICATED ON THE ELECTRICAL DRAWINGS AND SPECIFIED DIVISION 26.

1.7.4. ELECTRIC CONTROLS, CONTACTORS, STARTERS, PILOT LIGHTS, PUSH BUTTONS, ETC., SHALL BE PROVIDED COMPLETE AS PART OF THE MOTOR, HEATER OR OTHER EQUIPMENT WHICH IT OPERATES. ALL ELECTRICAL COMPONENTS SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND DIVISION 26.

1.8. WHERE EQUIPMENT SPECIFICATIONS INDICATE THAT A FACTORY-AUTHORIZED SERVICE ENGINEER OR TECHNICIAN SHALL OBSERVE INSTALLATION, TEST & ADJUST, OR START-UP OF EQUIPMENT, ETC.; SUCH SERVICES WILL BE CONTRACTED BY OWNER AS PART OF THE EQUIPMENT PURCHASE.

1.8.1. CONTRACTOR SHALL ARRANGE FOR, SCHEDULE, AND COORDINATE SUCH FIELD SERVICES AS WORK INCLUDED IN THE CONTRACT.

1.8.2. CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS NECESSARY TO SUPPORT ALL SUCH FACTORY REPRESENTATIVE'S FIELD SERVICES.

1.9. REGULARLY DURING EACH WORKING DAY, REMOVE REFUSE AND DEBRIS ACCUMULATING FROM ELECTRICAL CONSTRUCTION AND LEAVE AREA CLEAN AT END OF THE WORK DAY.

1.9.1. PRIOR TO ACCEPTANCE OF THIS WORK, LEAVE THE PREMISES "BROOM CLEAN" INSOFAR AS AFFECTED BY ELECTRICAL WORK.

1.9.2. CLEAN ALL LIGHT FIXTURES, LAMPS AND LENSES PRIOR TO FINAL ACCEPTANCE.

1.9.3. CLEAN THE INTERIOR OF EACH ELECTRICAL COMPONENT OF DIRT AND CONSTRUCTION DUST INCLUDING BUT NOT LIMITED TO OUTLET/JUNCTION/PULL BOXES, PANEL BOARDS, CONTROLLERS, AND SWITCHES BEFORE ENERGIZING.

1.9.4. EXPOSED FINISHED MATERIALS AND EQUIPMENT SHALL BE CAREFULLY CLEANED AND WIPED TO REMOVE GREASE, SMUDGES, FINGERPRINTS, DUST AND OTHER SPOTS AND LEFT SMOOTH AND CLEAN.

1.9.5. CLEAN THE EXTERIOR OF ELECTRICAL COMPONENTS PRIOR TO ACCEPTANCE OF WORK.

1.9.6. FOR ALL MATERIALS AND DEVICES REMOVED, THE CONTRACTOR SHALL DISPOSE OFF-SITE IN AN APPROVED MANNER. PROVIDE WRITTEN DOCUMENTATION FOR DISPOSAL OF ALL ITEMS.

1.10. PROVIDE ALL LABOR, INSTRUMENTS, AND OTHER SERVICES REQUIRED FOR COMPLETE AND SATISFACTORY TEST AND ADJUSTMENT OF ELECTRICAL SYSTEMS AND RELATED WORK.

1.10.1. CHECK ALL MOTORS AND ROTATING EQUIPMENT FOR PROPER ROTATION.

1.10.2. TEST ALL FEEDERS WITH MEGGER PRIOR TO ENERGIZING TO ASSURE CODE RESISTANCE IS MET, (AND WITHOUT 'SHORTS' OR 'OPEN CIRCUITS').

1.10.3. CHECK ALL FUSES AND OVERLOADS FOR PROPER SIZING. VERIFY FUSE LABELS ARE VISIBLE.

1.10.4. CHECK ALL ELECTRICAL POWER AND CONTROL WIRING, INTERLOCKS, ETC., RELATED TO MECHANICAL EQUIPMENT TO DETERMINE THAT ALL WIRING IS CORRECT.

1.10.5. IMMEDIATELY REMEDIATE ALL EQUIPMENT PROVIDED UNDER THIS DIVISION THAT TESTS PROVE TO BE DEFECTIVE OR OPERATING IMPROPERLY AS A PART OF THIS CONTRACT.

1.11. CONTRACTOR AND VENDOR SHALL INSTRUCT THE OWNER'S TECHNICAL PERSONNEL ON ALL OWNER FURNISHED EQUIPMENT IN ACCORDANCE WITH SPECIFICATIONS.

1.11.1. CONTRACTOR SHALL PROVIDE OWNER WITH SUFFICIENT SETS OF OPERATIONS AND MAINTENANCE MANUALS OF CONTRACTOR FURNISHED EQUIPMENT FOR INCLUSION INTO THE OWNER'S OPERATIONS AND MAINTENANCE MANUALS AS REQUIRED BY THE SPECIFICATIONS.

1.11.2. PROJECT WILL NOT BE COMPLETE UNTIL ACCURATE O/M MANUALS ARE DELIVERED.

1.11.3. O/M MANUALS SHALL INCLUDE CATALOG TECHNICAL DATA, RECOMMENDED SERVICE PROCEDURES, RECOMMENDED SERVICE INTERVALS, CALIBRATION INFORMATION, FACTORY TRAINING MANUALS, MAGNETIC MEDIA FOR SOFTWARE PROVIDED, AND RECOMMENDED SPARE PARTS.

1.12. GUARANTEE ALL ELECTRICAL SYSTEM EQUIPMENT, MATERIALS, AND WORKMANSHIP TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE AND PROPERLY CORRECT LATENT DEFECTS ARISING DURING THIS PERIOD UPON NOTIFICATION BY THE OWNER'S REPRESENTATIVE WITHOUT ADDITIONAL COMPENSATION AND TO THE SATISFACTION OF THE ENGINEER AND OWNER'S REPRESENTATIVE.

1.13. ALL EQUIPMENT, ETC., SHALL BE NEW UNLESS OTHERWISE NOTED, AND AS SPECIFIED FREE OF DEFECTS. ALL ELECTRICAL EQUIPMENT SHALL BE U.L. OR E.T.L. LISTED.

2. CODES AND PERMITS

2.1. ENTIRE INSTALLATION (INCLUDING EQUIPMENT, DEVICES, AND WIRING) SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF THE NATIONAL ELECTRICAL CODE (N.E.C.), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 70 & NFPA 101), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A.), INTERNATIONAL BUILDING CODE (I.B.C), INTERNATIONAL ENERGY CONSERVATION CODE (I.E.C.C.), AND ALL LAWS & ORDINANCES APPLICABLE TO WORK AT THIS SITE. IN ADDITION, INSTALLATION SHALL MEET APPROVAL OF LOCAL INSPECTION AUTHORITY HAVING JURISDICTION. REFER TO COVER SHEET FOR LIST OF CURRENT APPLICABLE CODE EDITIONS.

2.2. SECURE AND PAY ALL FEES ASSOCIATED WITH ALL PERMITS AND LICENSES REQUIRED FOR EXECUTION OF THE CONTRACT. ARRANGE FOR ALL INSPECTIONS REQUIRED BY CITY, COUNTY, STATE AND OTHER AUTHORITIES HAVING JURISDICTION, AND DELIVER CERTIFICATES OF APPROVAL TO THE ARCHITECT.

2.3. A CERTIFICATE OF APPROVAL FOR WORK FROM INSPECTION AUTHORITY SHALL BE GIVEN TO THE OWNER BEFORE FINAL ACCEPTANCE WILL BE GIVEN BY OWNERS REPRESENTATIVE.

2.4. THE CODE REQUIREMENTS ARE STRICTLY A MINIMUM AND SHALL BE MET WITHOUT INCURRING ADDITIONS TO THE CONTRACT. WHERE REQUIREMENTS OF THE DRAWINGS OR SPECIFICATIONS EXCEED THE CODE REQUIREMENTS, THE WORK SHALL BE PROVIDED IN ACCORDANCE WITH THESE DRAWINGS OR SPECIFICATIONS. IN THE EVENT OF CONFLICT OR AMBIGUITY BETWEEN THE VARIOUS CODES, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.

3. SAFETY

3.1. THE CONTRACTOR SHALL MAINTAIN A SAFE WORK ENVIRONMENT AT ALL TIMES.

3.1.1. COMPLY WITH ALL O.S.H.A., N.I.O.S.H., D.O.T., STATE & LOCAL REQUIREMENTS REGARDING SAFE HANDLING, STORING, TRANSPORTING, AND DISPENSING OF CHEMICALS.

3.1.2. MAINTAIN AND DISPLAY M.S.D.S. INFORMATION FOR ALL CHEMICAL PRODUCTS.

3.1.3. PROVIDE ALL NECESSARY MEANS TO MAINTAIN SAFE WORKING CONDITIONS, INCLUDING VENTILATION FANS, FIRE EXTINGUISHERS, EYE PROTECTION, RESPIRATORS, PROTECTIVE CLOTHING, VENTILATION, ETC.

3.1.4. ALL EQUIPMENT AND MATERIALS USED TO IMPLEMENT THE WORK SHALL BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS, INCLUDING ALL RECOMMENDED SAFETY PRECAUTIONS.

3.1.5. MAINTAIN A PROPER FIRE WATCH FOR ALL OPERATIONS WHERE SPARKS, FLAMES, OR OTHER SOURCES OF FIRE ARE PRODUCED.

3.1.6. FOR ALL MATERIALS CONTAINING SOLVENTS, MAINTAIN THE RECOMMENDED VENTILATION OF THE AREA TO PREVENT THE ACCUMULATION OF VAPORS WHICH POSE A HEALTH OR FIRE HAZARD.

4. INTENT OF DRAWINGS AND SPECIFICATIONS

4.1. THE IMPLIED AND STATED INTENT OF THE DRAWINGS & SPECIFICATIONS ARE TO ESTABLISH MINIMUM ACCEPTABLE STANDARDS FOR MATERIALS, EQUIPMENT, WORKMANSHIP, AND TO PROVIDE OPERABLE SYSTEMS THAT ARE COMPLETE IN EVERY RESPECT.

4.2. ENGINEERING DRAWINGS ARE DIAGRAMMATIC, INTENDED TO SHOW GENERAL ARRANGEMENT AND SIZES OF SYSTEM COMPONENTS, AND SHALL NOT BE SCALED.

4.2.1. ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL GOVERN SPACE CONSTRAINTS, DIMENSIONS AND FINISHES.

4.2.2. ALL OFFSETS AND FITTINGS THAT SHALL BE NECESSARY TO ACCOMPLISH A FINISHED INSTALLATION SHALL BE PROVIDED AT NO ADDITIONAL COST OR INCREASE THE CONTRACT.

4.2.3. WORK INTENDED, BUT HAVING MINOR DETAILS OBVIOUSLY OMITTED, SHALL BE PROVIDED COMPLETE AS A REQUIREMENT OF THIS CONTRACT.

4.2.4. LOCATIONS OF EQUIPMENT INDICATED ON PLANS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE TO THE PLANS SUBJECT TO BUILDING CONSTRUCTION AND INTERFERENCES WITH OTHER TRADES.

4.2.5. MAINTAIN MINIMUM SERVICE CLEARANCE AS REQUIRED BY THE EQUIPMENT MANUFACTURER AND N.E.C.

4.3. PROVIDE THE OWNER A COMPLETE SET OF RECORD DRAWINGS AT THE END OF THE PROJECT. PROJECT WILL NOT BE COMPLETE UNTIL ACCURATE RECORD DRAWINGS ARE DELIVERED.

4.4. LOCATIONS OF ALL UNDERGROUND PIPING AND UTILITIES SHALL BE CLEARLY SHOWN AND DIMENSIONED FROM PERMANENT REFERENCE POINTS SUCH AS BUILDING COLUMN LINES.

4.5. ALL ITEMS MOUNTED IN OR BELOW THE CEILING, AND ALL ITEMS PENETRATING THE CEILING, SHALL BE COORDINATED WITH THE ARCHITECTURAL REFLECTED CEILING PLANS. IF ANY ITEMS ARE NOT SHOWN ON THESE PLANS, OR ANY ITEMS NEED TO BE RELOCATED FOR COORDINATION PURPOSES, PREPARE A REFLECTED CEILING PLAN AND SUBMIT IT TO THE ARCHITECT FOR APPROVAL.

5. EXISTING CONDITIONS

5.1. AIIENIION IS CALLED TO THE FACT THAT THE WORK IS TO BE PERFORMED WITHIN AN EXISTING, OPERATIONAL FACILITY.

5.2. THE FOLLOWING GENERAL PROVISIONS OF THE CONTRACT, INCLUDING THE GENERAL & SUPPLEMENTAL CONDITIONS AND GENERAL REQUIREMENTS, SHALL APPLY TO THE WORK IN THIS DRAWING AND SPECIFICATION SET.

5.2.1. VISIT THE SITE OF THE WORK AND BECOME THOROUGHLY FAMILIAR WITH ALL EXISTING CONDITIONS, AND THOROUGHLY REVIEW ALL DRAWINGS, SPECIFICATIONS AND ADDENDA PRIOR TO BIDDING ON THIS WORK. NO EXTRA PAYMENTS TO THE CONTRACT AMOUNT WILL BE ALLOWED FOR FAILURE TO COMPLY WITH THIS REQUIREMENT.

5.2.2. TAKE MEASUREMENTS AND BE RESPONSIBLE FOR EXACT SIZE AND LOCATIONS OF ALL OPENINGS REQUIRED FOR THE INSTALLATION OF WORK.

5.2.3. FIELD DIMENSIONS ARE REASONABLY ACCURATE AND SHOULD GOVERN IN SETTING OUT WORK.

5.2.4. WHERE DETAILED METHOD OF INSTALLATION IS NOT INDICATED OR WHERE VARIATIONS EXIST BETWEEN DESCRIBED WORK AND APPROVED PRACTICE, DIRECTION OF THE OWNERS REPRESENTATIVE ON JOB SITE SHALL BE FOLLOWED.

5.3. CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.

5.3.1. SHOULD ANY CONDITIONS EXIST THAT ARE CONTRARY TO THOSE SHOWN ON THE DRAWINGS, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO FABRICATION OR PERFORMING ANY WORK IN THE AREA INVOLVING THE DIFFERENCES.

5.3.2. NOTIFICATION SHALL BE IN THE FORM OF A DRAWING OR SKETCH INDICATING FIELD MEASUREMENTS OR NOTES RELATING TO THE AREA.

5.4. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND WORKMANLIKE MANNER.

5.4.1. WHERE AN EXISTING STRUCTURE MUST BE CUT OR EXISTING UTILITIES INTERFERE, SUCH OBSTRUCTION SHALL BE BYPASSED, REMOVED, REPLACE OR RELOCATED, PATCH AND REPAIR.

5.4.2. WORK DISTURBED OR DAMAGED SHALL BE REPLACED OR REPAIR TO ITS PRIOR CONDITION.

5.5. PRIOR TO THE START OF ANY DEMOLITION OR CONSTRUCTION, CONTRACTOR SHALL REVIEW THE EXISTING SITE AND SECURE THE SERVICES OF A QUALIFIED, EPA CERTIFIED ASBESTOS ABATEMENT AGENCY IF NEEDED TO CHECK THE EXISTING INSULATION, ETC. FOR ASBESTOS. SHOULD ASBESTOS BE FOUND, DO NOT PROCEED WITH DEMOLITION OR CONSTRUCTION; NOTIFY THE ARCHITECT IN ANY CASE IN WRITING OF THE AGENCY'S FINDING.

5.6. FOR RENOVATION PROJECTS – PROVIDE ALL DEMOLITION, PATCHING, SAW CUTTING, EXCAVATION, TRENCHING, SHORING, COMPACTING, DE-WATERING, ETC. REQUIRED FOR THE PROJECT, WHETHER OR NOT SHOWN ON THE DRAWINGS.

5.6.1. INFORMATION WAS TAKEN FROM VARIOUS ARCHIVE DRAWINGS AND LIMITED FIELD OBSERVATION. FIELD VERIFICATION OF EXISTING CONDITIONS AND POINTS OF CONNECTIONS ARE REQUIRED.

5.7. EXISTING SYSTEMS TO REMAIN – WHERE EXISTING SYSTEMS ARE INDICATED TO REMAIN, THEY SHALL BE ASSUMED TO BE IN GOOD WORKING ORDER REQUIRING NO WORK UNLESS SPECIFICALLY NOTED.

5.7.1. IF DURING THE CONSTRUCTION DEFICIENCIES ARE NOTED, THEN BRING THESE TO THE ATTENTION OF THE OWNER AND SEEK DIRECTION.

6. SHOP DRAWINGS, SUBMITTALS, AND SUBSTITUTIONS

6.1. ENGINEER OF RECORD SHALL BE PROVIDED WITH SHOP DRAWINGS, COORDINATION DRAWINGS, AND MANUFACTURER'S DATA OF ANY CONTRACTOR FURNISHED MATERIALS AND EQUIPMENT, PRIOR TO PURCHASE AND/OR FABRICATION, AND SHALL VERIFY, BY STAMPING AND SIGNING THE DATA AND DRAWINGS BEFORE RETURNING THEM TO THE CONTRACTOR, THAT THE ITEMS FURNISHED BY THE CONTRACTOR FIT THE SPACES AND DIMENSIONS DESCRIBED IN AND CONFORM TO THE SPIRIT AND INTENT OF THE CONTRACT DOCUMENTS.

6.1.1. ENGINEER SHALL, WITHIN FIVE (5) WORKING DAYS OF RECEIPT OF SHOP DRAWINGS AND PRODUCT DATA, NOTIFY THE CONTRACTOR OF ANY DISCREPANCY OR INCOMPATIBILITY WITH THE CONTRACT DOCUMENTS, AND SHALL RETURN THE SHOP DRAWINGS TO THE CONTRACTOR APPROPRIATELY ANNOTATED.

6.1.2. REVIEW OF SUBMITTALS SHALL NOT BE CONSTRUED AS AUTHORIZING ANY DEVIATIONS FROM THE PLANS AND SPECIFICATIONS UNLESS SUCH DEVIATIONS ARE CLEARLY IDENTIFIED AND SEPARATELY SUBMITTED IN THE FORM OF A LETTER THAT IS ENCLOSED WITH THE SUBMITTALS.

6.1.3. SUBMIT SHOP DRAWING CUT SHEETS AND TECHNICAL DATA ON THE FOLLOWING ITEMS: LIGHTING EQUIPMENT, PANELS, WIRING DEVICES-SWITCHES AND RECEPTACLES, DISCONNECT SWITCHES/SAFETY SWITCHES, MOTOR STARTERS, TRANSFORMERS, AND ANY OTHER ITEM REQUIRED BY NOTES.

6.1.4. SUBMIT CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS, FIELD INSTALLATION DRAWINGS AND CERTIFICATIONS AS REQUIRED FOR COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OF EQUIPMENT. THE SUBMITTAL DATA SHALL PROVIDE AMPLE, UNQUESTIONABLE COMPLIANCE WITH THE CONTRACT DOCUMENTS.

6.1.5. SUBMIT PROPOSED CONTROL SYSTEM FOR REVIEW BY THE ENGINEER PRIOR TO EQUIPMENT PURCHASE OR FABRICATION. DO NOT PROCEED WITH THE WORK WITHOUT APPROVED SUBMITTALS.

6.1.6. EQUIPMENT PERFORMANCE SHALL BE VERIFIED BY THE EQUIPMENT MANUFACTURER AS PART OF THE SUBMITTAL, PRIOR TO ORDERING.

6.1.7. VERIFY EQUIPMENT VOLTAGE AND ELECTRICAL REQUIREMENTS OF THE EQUIPMENT WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.

6.1.8. SHOP DRAWINGS FOR EQUIPMENT REQUIRING ELECTRIC POWER OR CONTROL WIRING CONNECTIONS SHALL INCLUDE COMPLETE WIRING DIAGRAMS.

6.2. REFER TO THE CONDITIONS OF THE CONTRACT (GENERAL AND SUPPLEMENTARY WHEN INCLUDED AND OTHER DIVISIONS) REFERENCING SUBMITTALS FOR SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES FOR SUBMITTAL DEFINITIONS, REQUIREMENTS AND PROCEDURES.

6.3. BEFORE PREPARING SUBMITTALS, STUDY ALL CONTRACTS DRAWINGS AND SPECIFICATIONS IN DETAIL, OBTAIN MANUFACTURER'S RECOMMENDED INSTRUCTIONS, AND HAVE SUBMITTALS PREPARED BASED ON SPECIFIC EQUIPMENT AND MATERIAL PROPOSED FOR INSTALLATION.

6.3.1. AN OFFICER OF THE CONTRACTING FIRM SHALL SIGN ALL SHOP DRAWINGS (CERTIFYING CONFORMANCE WITH PLANS AND SPECIFICATIONS) BEFORE SUBMITTING TO THE ARCHITECT OR RELEASING TO THE FIELD.

6.4. THE SUBMITTAL PROCESS SHALL NOT BE UTILIZED AS AN AVENUE TO SUBSTITUTE AFTER THE EXECUTION OF THE CONTRACT.

6.4.1. SHOULD AN UNSPECIFIED OR UNEQUAL PRODUCT BE SUBMITTED, IT WILL BE REJECTED. IF A SECOND ATTEMPT AT SUBSTITUTION IS MADE DURING THE RE-SUBMITTAL OF THE SAME PRODUCT, THEN NO MORE REVIEWS OF THAT PRODUCT WILL BE PERFORMED WITHOUT DIRECT COMPENSATION TO THE ENGINEER BEING PAID FOR THE ADDITIONAL SERVICES REQUIRED FOR THE THIRD REVIEW AND ANY FURTHER REVIEWS.

6.5. IN ADDITION TO THE OTHER REQUIREMENTS IN PARAGRAPHS ABOVE, THE FOLLOWING APPLIES TO SUBMITTALS OF THIS DIVISION:

6.5.1. DO NOT INSTALL OR ORDER ELECTRICAL EQUIPMENT OR PROCEED WITH THE WORK UNTIL SUBMITTALS HAVE BEEN ACCEPTABLY REVIEWED BY THE OWNER'S REPRESENTATIVE AND STAMPED ACCORDINGLY. EQUIPMENT OR WORK WHICH IS ORDERED OR INSTALLED WITHOUT PRIOR APPROVED SUBMITTALS SHALL, AT THE ENGINEER'S DISCRETION, BE REMOVED AT NO COST TO THE OWNER. NO ALLOWANCES WILL BE MADE FOR REWORK OR DELAY DUE TO NEGLECT OF REQUIRED APPROVAL PROCESS.

6.5.2. MAKE ALL ELECTRICAL SUBMITTALS AT ONE TIME AND WITHIN FOURTEEN (14) CALENDAR DAYS OF OWNER'S "NOTICE TO PROCEED".

6.5.3. SUBMITTAL DATA WILL BE PROVIDED AND REVIEWED IN PDF FORMAT ELECTRONICALLY VIA EMAIL.

6.5.4. SUBMITTAL DATA WILL NOT BE ACCEPTED FOR REVIEW UNLESS THEY:

6.5.4.1. COMPLY WITH THE REQUIREMENTS OF DIVISION 1.

6.5.4.2. INCLUDE COMPLETE INFORMATION PERTAINING TO ALL APPURTENANCE AND ACCESSORIES.

6.5.4.3. ARE SUBMITTED AS COMPLETE PACKAGES WHICH PERTAIN TO ALL RELATED ITEMS IN DIVISION 26.

6.5.4.4. ARE PROPERLY MARKED WITH EQUIPMENT, SERVICE OR FUNCTION IDENTIFICATION AS RELATED TO THE PROJECT AND ARE MARKED WITH PERTINENT SPECIFICATION PARAGRAPH NUMBER.

6.5.5. IF ANY ITEM IN THE SUBMITTAL IS "NOT ACCEPTABLE" FOR ANY REASON, IT AUTOMATICALLY VOIDS THE ENTIRE SET, AND A RE-SUBMIT OF ALL IS REQUIRED TO OBTAIN ACCEPTANCE OF ALL ITEMS.

6.5.6. IN CASE OF DISCREPANCIES BETWEEN SETS OF SUBMITTALS, THE SET RETAINED BY THE OWNER'S REPRESENTATIVE SHALL HAVE PRECEDENCE.

6.6. THE FOLLOWING REQUIREMENTS HELP TO IDENTIFY, TRACK AND KEEP THE PROJECT ORGANIZED FOR ALL PARTIES INVOLVED. THEY ARE NECESSARY TO ENSURE A TIMELY TURNAROUND AND AN APPROPRIATE TECHNICAL REVIEW. SUBMITTALS THAT DO NOT CONFORM TO THE ADMINISTRATIVE REQUIREMENTS ARE REJECTED AND RETURNED, WITHOUT TECHNICAL REVIEW.

6.6.1. SUPPLY SUBMITTALS FOR EACH SECTION: SUBMITTALS SHALL BE SUPPLIED ON A SECTION-BY-SECTION AND TYPE-BY-TYPE BASIS. SEPARATE PDF FILE PACKAGES SHALL BE SUPPLIED FOR EACH SECTION, FOR EACH SUBMITTAL TYPE. EACH PDF SHALL REPRESENT A SINGLE STANDALONE SUBMITTAL.

6.6.2. INCLUDE A TRANSMITTAL: TRANSMITTALS SHALL ENUMERATE EACH SUBMITTAL FOR EACH SECTION OF EACH TYPE AND ITERATION.

6.6.3. INCLUDE COVER SHEET/ TITLE PAGE: THE COVER SHEET SHALL INCLUDE THE INFORMATION IDENTIFIED IN THE CONTRACT DOCUMENTS. IT SHALL BE INCLUDED AS THE FIRST PAGE OF EACH ELECTRONIC AND/OR HARDCOPY DOCUMENT-BASED SUBMITTAL.

6.6.4. INCLUDE AN INDEX: THE INDEX SHALL ENUMERATE THE CONTENTS OF 1HE SUBMITTAL.

6.6.5. INCLUDE CHECKLISTS: WHERE CHECKLISTS ARE INCLUDED WITH THE SPECIFICATIONS, COMPLETE AND INCLUDE THEM WITHIN THE APPROPRIATE SUBMITTAL.

6.6.6. SUPPLY COMPLETE SUBMITTALS: COMPLETE SUBMITTALS OF EACH TYPE ARE REQUIRED. PARTIAL SUBMITTALS WILL BE REJECTED. WHERE A SECTION REQUIRES A PRODUCT DATA SUBMITTAL, ALL PRODUCT DATA FOR THAT SECTION SHALL BE SUPPLIED TOGETHER, AT ONE TIME, AS ONE COMPLETE SUBMITTAL. WHEN RE-SUBMITTAL IS REQUIRED (I.E. REVISE AND RESUBMIT) THE REVISED SUBMITTAL SHALL BE MORE COMPLETE, MORE ACCURATE, AND MORE CONTRACT-COMPLIANT THAN ITS REJECTED PREDECESSOR. THE SUBMITTAL NUMBER (FOR EACH SECTION AND TYPE) SHALL INCREMENT FOR EACH SUBSEQUENT SUBMITTAL (DO – ORIGINAL SUBMISSION , 01 – FIRST RESUBMISSION, 02 –SECOND RESUBMISSION, ETC.). RE-SUBMITTALS SHALL INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWER'S COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.

6.6.7. IF EXPRESSLY PERMITTED BY THE OWNER AND THE TERMS OF THE CONTRACT, EDITABLE ELECTRONIC VERSIONS OF PUBLISHED TWO-DIMENSIONAL PLAN DRAWINGS MAY BE MADE AVAILABLE FOR THE CREATION OF SHOP AND AS-BUILT DRAWINGS.

6.6.8. DUE TO THE PROPRIETARY NATURE OF INTERNAL DESIGN SYSTEMS, EDITABLE NATIVE-SOFTWARE VERSIONS OF SOME DRAWINGS, INCLUDING BUT NOT LIMITED TO SYSTEM DIAGRAMS AND DETAILS WILL NOT BE MADE AVAILABLE IN AN EDITABLE FORM. IN THESE CASES, ELECTRONIC VERSIONS OF THE DRAWINGS MAY BE MADE AVAILABLE ONLY IN PDF, JPG, OR SIMILAR NON-EDITABLE ELECTRONIC FORM, AT THE SOLE DISCRETION OF THE DESIGN PROFESSIONAL.

6.7. EQUIPMENT AND DESIGN OF SYSTEMS INDICATED ON THE DESIGN DRAWINGS AND WITHIN THESE SPECIFICATIONS SHALL BE CONSIDERED AS SPECIFIED STANDARD OF QUALITY.

6.7.1. NO SUBSTITUTIONS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER.

6.7.2. ALL COSTS ARISING FROM A SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR MAKING THE SUBSTITUTION, INCLUDING VERIFICATION OF FIT AND ACCESS, FIELD-INSTALLED ACCESSORIES, SUPPORTS, ELECTRICAL REQUIREMENTS, AND REVISIONS TO DOCUMENTS (DESIGN COSTS).

6.8. WHERE MATERIAL OR EQUIPMENT IS IDENTIFIED BY PROPRIETARY NAME, MODEL NUMBER AND/OR MANUFACTURER, FURNISH THE NAMED ITEM OR EQUAL THEREOF. SUBSTITUTED ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND PERFORMANCE AND MUST BE SUITABLE FOR THE AVAILABLE SPACE, REQUIRED ARRANGEMENT, AND APPLICATION.

6.8.1. MANUFACTURER'S NAME, SERIES AND MODEL NUMBERS, AS NOTED OR SPECIFIED, ARE FOR THE PURPOSE OF DESCRIBING TYPE, CAPACITY, AND QUALITY OF EQUIPMENT, MATERIALS AND PRODUCTS TO BE USED.

6.8.2. UNLESS OR EQUAL IS SPECIFICALLY STATED, BIDS SHALL BE BASED ONLY ON THE SPECIFIED BASIS OF DESIGN MANUFACTURER.

6.8.3. THE LISTING OF A PARTICULAR MANUFACTURER AS AN EQUAL OR ACCEPTABLE SUBSTITUTE MANUFACTURER SHALL NOT BE MISCONSTRUED AS APPROVING NOR ALLOWING THE SUBSTITUTION OF THAT MANUFACTURER'S STANDARD PRODUCT IN PLACE OF THE BASIS DESIGN.

6.8.4. NO CONSIDERATION WILL BE GIVEN TO A PRODUCT WHICH WOULD REQUIRE DIMENSIONAL, SPATIAL OR AESTHETIC CHANGES TO THE PROJECT. ACCEPTABLE SUBSTITUTE AND EQUAL MANUFACTURERS SHALL ONLY BID THOSE PRODUCTS WHICH EXACTLY MATCH THE SIZE AND OTHER CHARACTERISTIC OF THE SPECIFIED BASIS OF DESIGN.

6.8.5. ANY CHANGES TO OTHER DISCIPLINES AND TRADES OF WORK REQUIRED BY AN OR EQUAL OR SUBSTITUTE PRODUCT SHALL BE DULY CONSIDERED AND PRICED ACCORDINGLY PRIOR TO BIDDING OR PRICING.

6.8.6. THE DECISION AS TO WHETHER OR NOT A PROPOSED SUBSTITUTE OR EQUAL PRODUCT IS ACTUALLY EQUAL TO THAT SPECIFIED SHALL REST SOLELY WITH THE ENGINEER.

6.8.7. REQUEST TO PROVIDE EQUAL PRODUCTS IN LIEU OF THOSE SPECIFIED SHALL BE SUBMITTED TO THE ARCHITECT IN WRITING AT LEAST TEN (10) DAYS PRIOR TO FINAL PRICING AND EXECUTION OF THE CONTRACT. NO CONSIDERATION WILL BE GIVEN TO SUBSTITUTE PRODUCTS AFTER FINAL PRICING AND EXECUTION OF THE CONTRACT.

6.8.8. IF DEEMED NECESSARY BY ARCHITECT, DESIGN CHANGES SHALL BE SIGNED AND SEAL BY A REGISTERED PROFESSIONAL ENGINEER, CURRENTLY LICENSED IN THIS STATE.

7. INSTALLATION

7.1. PROVIDE ALL EQUIPMENT FOR THIS CONTRACT NEATLY AND WITH WORKMANSHIP AS DEFINED BY N.E.C.A. "STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION", LEVEL AND PLUMB, AND SECURELY SUPPORTED.

7.1.1. THE ENTIRE INSTALLATION, AND MANNER OF INSTALLATION SHALL MEET THE COMPLETE SATISFACTION OF THE OWNER'S REPRESENTATIVE OR IT SHALL BE REMOVED AND REWORKED AS DIRECTED BY THE OWNER'S REPRESENTATIVE AS INCLUDED IN THE CONTRACT AMOUNT.

7.2. CONTRACTOR SHALL CONSULT PLUMBING, HVAC, AND STRUCTURAL PLANS (WHERE APPLICABLE) IN ALL INSTANCES BEFORE INSTALLING WORK SO THAT WORK WILL NOT INTERFERE WITH THOSE BRANCHES.

7.2.1. IN THE EVENT OF A CONFLICT, CONTRACTOR SHALL REPORT TO THE OWNERS REPRESENTATIVE AT ONCE AND DO NO FURTHER WORK UNTIL A SATISFACTORY ARRANGEMENT IS DECIDED UPON.

7.2.2. ANY WORK DONE, OR EQUIPMENT PLACED IN POSITION, BY CONTRACTOR THAT CREATES A CONFLICT IN VIOLATION HEREOF, SHALL BE READJUSTED TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT THE EXPENSE OF THE CONTRACTOR. THE DECISION OF THE OWNERS REPRESENTATIVE SHALL BE FINAL IN REGARD TO CHANGES DUE TO CONFLICTING CONDITIONS.

7.2.3. VERIFY VOLTAGE AND ALL ELECTRICAL REQUIREMENTS OF MECHANICAL EQUIPMENT AND SYSTEMS WITH DIV. 23 CONTRACTOR PRIOR TO ORDERING.

7.2.4. COORDINATION OF SPACE REQUIREMENTS WITH RESPECT TO DIVISION 23 SHALL BE PERFORMED SUCH THAT:

7.2.4.1. NO EQUIPMENT, PIPING OR DUCTWORK, OTHER THAN ELECTRICAL, SHALL BE INSTALLED WITHIN 42 OF SWITCHBOARDS OR PANELBOARDS.

7.3. TWO SETS OF ELECTRICAL DRAWINGS SHALL BE PROVIDED AS RECORD DRAWINGS WHICH SHALL BE SEPARATE, CLEAN, COPIES RESERVED FOR THE PURPOSE OF SHOWING A COMPLETE PICTURE OF THE WORK AS ACTUALLY INSTALLED.

7.3.1. DRAWINGS SHALL ALSO SERVE AS WORK PROGRESS REPORT SHEETS AND THE ELECTRICAL CONTRACTOR SHALL MAKE ANY NOTATIONS, NEAT AND LEGIBLE THEREON DAILY AS WORK PROCEEDS.

7.3.2. DRAWINGS SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES AND SHALL BE KEPT AT THE JOB AT A LOCATION DESIGNATED BY THE OWNERS REPRESENTATIVE.

7.3.3. AT THE COMPLETION OF THE WORK, THESE RECORD DRAWINGS SHALL BE SIGNED BY THE ELECTRICAL CONTRACTOR, DATED AND RETURNED TO THE OWNERS REPRESENTATIVE. FINAL PAYMENT OF CONTRACT WILL NOT BE MADE UNTIL RECEIPT AND REVIEW OF SAID DRAWINGS.

7.4. PROVIDE ALL ROOF, WALL, AND FLOOR PENETRATIONS REQUIRED TO COMPLETE INSTALLATION AND REMOVAL OF WORK (MAINTAIN FIRE RATING OF EXISTING STRUCTURE).

7.4.1. ALL PENETRATIONS SHALL BE PATCHED AND FINISHED TO MATCH SURROUNDING SURFACES AND FINISHES.

7.4.2. ALL EQUIPMENT OR PIPE PENETRATIONS THROUGH WALL, ROOF AND FLOORS SHALL BE SLEEVED AND SEALED SO AS TO BE WATER AND AIR TIGHT.

7.4.3. ALL ROOF CUTS AND REPAIRS SHALL BE PERFORMED BY OWNER APPROVED ROOFING CONTRACTOR IN ORDER TO MAINTAIN ROOF WARRANTY.

7.5. ALL WIRING SHALL BE IN CONDUIT. THE USE OF E.N.T., BX, NM, ETC. OR PRE-MANUFACTURED CABLE ASSEMBLIES OR ALUMINUM WIRE WILL NOT BE PERMITTED.

7.6. VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH SHOP DRAWING SUBMITTALS, FIELD MEASUREMENTS, AND WITH REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED PRIOR TO ROUGH-IN.

7.6.1. REFER TO EQUIPMENT SPECIFICATIONS AND DIMENSIONS SPECIFIED FOR ROUGH-IN REQUIREMENTS.

7.7. PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL WORK.

7.7.1. PATCH EXISTING FINISHED AND DISTURBED NEW FINISHED SURFACES AND BUILDING COMPONENTS USING NEW MATERIALS MATCHING EXISTING MATERIALS & EXPERIENCED INSTALLERS. INSTALLERS' QUALIFICATIONS REFER TO THE MATERIALS AND METHODS REQUIRED OR THE SURFACE AND BUILDING COMPONENTS BEING PATCHED.

7.7.2. NO ADDITIONAL COMPENSATION WILL BE AUTHORIZED FOR CUTTING AND PATCHING WORK THAT IS NECESSITATED BY ILL-TIMED, DEFECTIVE OR NON-CONFORMING INSTALLATIONS. ANY DAMAGE DONE BY THIS CONTRACTOR TO THE BUILDING DURING THE PROGRESS OF WORK SHALL BE MADE GOOD AT CONTRACTOR'S OWN EXPENSE.

7.8. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS

7.8.1. PROVIDE MANUFACTURER'S STANDARD SELF-ADHESIVE VINYL TAPE NOT LESS THAN 3 MILS THICK BY 1-1/2" WIDE. WHERE APPLICABLE, INSTALL ON ALL CONCEALED RACEWAYS AT CONNECTION TO ALL JUNCTION BOXES, PULL BOXES, EQUIPMENT, WALL/FLOOR/ROOF PENETRATIONS, ETC. UNLESS OTHERWISE INDICATED OR REQUIRED BY GOVERNING REGULATIONS.

7.8.1.1. PROVIDE ORANGE TAPE WITH BLACK LETTERS.

7.8.1.2. PROVIDE CIRCUIT IDENTIFICATION BANDS FOR ALL CABLES AND CONDUCTORS. PROVIDE MANUFACTURERS STANDARD COLOR CODING FOR CABLE/CONDUCTOR JACKET AND/OR INSULATION FOR ALL CABLES AND CONDUCTORS OF ALL SYSTEMS.

NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E401
ELECTRICAL SPECIFICATIONS

CHECKED: NYE DRAWN: NYE

DIVISION 26- ELECTRICAL SPECIFICATIONS

7.8.2. PROVIDE ENGRAVED PLASTIC-LAMINATE SIGN ON MAJOR UNITS OF ELECTRICAL EQUIPMENT, INCLUDING PANELBOARDS, DISCONNECTS, STARTERS, CONTROL PANELS, ETC. EXCEPT AS OTHERWISE INDICATED.

7.8.2.1. PROVIDE SINGLE LINE OF TEXT, 112" HIGH LETTERING, ON 1-1/2" HIGH SIGN (2" HIGH WHERE 2 LINES ARE REQUIRED).

7.8.2.2. MAKE NAMEPLATES FROM WHITE ENGRAVING STOCK WITH BLACK LETTERS AND BLACK FOUR EDGE BEVEL.

7.8.2.3. WORDING SHALL SUITABLY DESCRIBE ITEMS SUCH AS PANEL ID, SOURCE OVER CURRENT PROTECTION DEVICE, AND VOLTAGE.

7.8.2.4. NAMEPLATES SHALL BE ATTACHED USING PROPER SIZE AND TYPE STAINLESS STEEL BOLTS, LOCK WASHERS AND NUTS. GLUE ON,

7.8.2.5. TAPE ON, OR TAPE TYPE NAMEPLATES ARE NOT ACCEPTABLE FOR THE EQUIPMENT.

7.8.2.6. PROVIDE CIRCUIT NUMBERS (PANEL-#) ON EACH RECEPTACLE USING TAPE TYPE IDENTIFICATION AT EACH RECEPTACLE OR OTHERS WHERE IDENTIFIED.

7.8.2.7. PROVIDE TEXT MATCHING TERMINOLOGY AND NUMBERING OF THE CONTRACT DOCUMENTS AND SHOP DRAWINGS.

7.8.2.8. SECURE TO SUBSTRATE WITH FASTENERS, EXCEPT USE ADHESIVE WHERE FASTENERS SHOULD NOT OR CANNOT PENETRATE SUBSTRATE.

7.8.3. ALL EQUIPMENT AND SYSTEM IDENTIFICATION NOMENCLATURE SHOWN ON DRAWINGS OR LISTED HEREIN IS SHOWN FOR GENERAL DESIGN AND INSTALLATION REFERENCE ONLY. THE ACTUAL NAMEPLATE, ETC. NOMENCLATURE FOR THIS PROJECT SHALL BE VERIFIED BY ELECTRICAL CONTRACTOR IN FIELD PRIOR TO FABRICATION AND WHERE APPLICABLE, SHALL BE AN EXTENSION OF EXISTING NOMENCLATURE USED ON THE SITE AS DETERMINED IN FIELD BY ELECTRICAL CONTRACTOR.

7.8.4. EQUIPMENT TO BE LABELED:

7.8.4.1. ALL ENCLOSURES FOR ALL ELECTRICAL EQUIPMENT FURNISHED OR INSTALLED UNDER DIVISIONS 26 AND 28

7.8.4.2. REMOTE-CONTROLLED SWITCHES

7.8.4.3. DIMMER MODULES

7.8.4.4. CONTROL DEVICES VIA ENGRAVED WALL PLATES

7.8.4.5. MISCELLANEOUS CONTROL STATIONS

7.8.4.6. ACCESS DOORS AND PANELS FOR CONCEALED ELECTRICAL ITEMS

7.8.4.7. OTHER SIMILAR EQUIPMENT DESIGNATED BY OWNER'S REPRESENTATIVE, ARCHITECT OR ENGINEER IN FIELD.

7.9. BEARINGS THAT REQUIRE LUBRICATION SHALL BE LUBRICATED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

7.10. ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER BUILDING COMPONENTS DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR ELECTRICAL INSTALLATIONS.

7.11. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SLEEVES TO BE SET IN POURED-IN-PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS, AS THEY ARE CONSTRUCTED.

7.12. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLATIONS OF ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. GIVE PARTICULAR ATTENTION TO LARGE EQUIPMENT REQUIRING POSITIONING PRIOR TO CLOSING IN THE BUILDING.

7.13. THE EXACT MOUNTING HEIGHT OF DEVICES SHALL BE DETERMINED IN THE FIELD WITH RELATION TO ARCHITECTURAL DETAILS AND EQUIPMENT BEING SERVED.

7.13.1. IT SHALL BE THE RESPONSIBILITY OF CONTRACTOR TO COORDINATE OUTLET LOCATION WITH EQUIPMENT. OWNERS REPRESENTATIVE SHALL BE PERMITTED TO RELOCATE ANY OUTLET PRIOR TO INSTALLATION WITHIN A 15 FOOT LIMIT AT NO ADDITIONAL CHARGE IN CONTRACT PRICE.

7.13.2. ALL FASTENERS, HANGERS, AND METHODS OF HANGING EXPOSED WORK IN FINISHED AREAS SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE FOR APPROVAL BEFORE INSTALLATION.

7.13.3. WHERE MOUNTING HEIGHTS ARE NOT DETAILED OR DIMENSIONED, INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO PROVIDE THE MAXIMUM HEADROOM POSSIBLE.

7.14. INSTALL ELECTRICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.

7.15. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT GIVING RIGHT-OF-WAY PRIORITY TO SYSTEMS REQUIRED TO BE INSTALLED AT A SPECIFIED SLOPE.

7.16. TOUCH-UP PAINTING: CLEAN FIELD WELDS AND ABRADED AREAS OF SHOP PAINT. PAINT EXPOSED AREAS IMMEDIATELY AFTER ERECTING HANGERS AND SUPPORTS. USE SAME MATERIALS AS USED FOR SHOP PAINTING.

8. RACEWAYS

8.1. EXTENT OF RACEWAY WORK IS INDICATED DIAGRAMMATICALLY ON THE DRAWINGS OR IN THE SCHEDULES. CONTRACTOR SHALL ONLY PROVIDE TYPE REQUIRED FOR APPLICATION.

8.2. INSTALL ALL WIRING IN CONDUIT (EXCEPT WHERE NOTED UNDER WIRE AND CABLE) AND PROVIDE EMPTY CONDUIT FOR SPECIAL SYSTEMS DESCRIBED ELSEWHERE.

8.3. ALL CONDUIT EMBEDDED IN CONCRETE SHALL BE 3/4" MINIMUM. ALL EXTERIOR UNDERGROUND CONDUIT SHALL BE 1" MINIMUM.

8.4. SUPPORT ALL CONDUIT NOT EMBEDDED IN CONCRETE OR MASONRY SO THAT STRAIN IS NOT TRANSMITTED TO OUTLET BOXES AND PULL BOXES, ETC. SUPPORTS TO BE SUFFICIENTLY RIGID TO PREVENT DISTORTION OF CONDUITS DURING WIRE PULLING.

8.5. WHEN SIZE IS NOT INDICATED ON PLANS, CONDUIT SHALL BE SIZED FOR CONDUCTORS IN ACCORDANCE WITH TABLES 3(A)(B)(C), CHAPTER 9 OF THE N.E.C..

8.6. THE ROUTING AND METHOD OF INSTALLATION OF CONDUITS SHALL BE COORDINATED WITH ALL TRADES PRIOR TO INSTALLATION SO AS NOT TO INTERFERE WITH OTHER EQUIPMENT INSTALLATIONS. COORDINATED INSTALLATION SHALL MEET THE COMPLETE SATISFACTION OF THE OWNER'S REPRESENTATIVE OR SHALL BE REINSTALLED AT NO COST TO THE OWNER.

8.7. THE USE OF INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL NON-METALLIC TUBING (ENT), ARMORED CABLE (AC), OR MANUFACTURED CABLE ASSEMBLIES SHALL NOT BE INCORPORATED INTO THE WORK, UNLESS NOTED OTHERWISE. SHOULD CONTRACTOR FAIL TO UTILIZE APPROVED RACEWAYS, OWNER'S REPRESENTATIVE CAN REQUEST THE REMOVAL AND REPLACEMENT OF ALREADY INSTALLED RACEWAY AT NO COST TO THE OWNER.

8.8. USE ONLY THE TYPES OF RACEWAYS SPECIFIED HEREIN.

8.8.1. TYPES OF RACEWAYS SPECIFIED IN THIS SECTION INCLUDE THE FOLLOWING:

8.8.1.1. ELECTRICAL METALLIC TUBING (EMT); GALVANIZED STEEL; MINIMUM TRADE SIZE 3/4".

8.8.1.2. FLEXIBLE METAL CONDUIT (FMC). MINIMUM TRADE SIZE 3/4".

8.8.1.3. LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC), (SEALTIGHT) MINIMUM TRADE SIZE 3/4".

8.8.1.4. RIGID METAL CONDUIT (RMC). MINIMUM TRADE SIZE 3/4".

8.8.1.5. RIGID NONMETALLIC CONDUIT (PVC). SCHEDULE 40, MINIMUM TRADE SIZE 3/4".

8.9. TYPE MC (METAL-CLAD) CABLE: FORM FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC-COATED OR GALVANIZED (INSIDE AND OUTSIDE) STRIP STEEL OR ALUMINUM JACKET, WITH STRANDED COPPER CONDUCTORS WITH 90 DEG. C THHN INSULATION SYSTEM.

8.9.1. PROVIDE FOR FINAL CONNECTIONS TO LIGHT FIXTURES THAT ARE INSTALLED IN ACCESSIBLE TILE CEILING SYSTEMS (LIMITED TO 6' MAXIMUM IN LENGTH AND LIMITED TO "WHIPS" FROM BUILDING ELECTRICAL SYSTEM JUNCTION BOXES DOWN TO LIGHT FIXTURES).

8.9.1.1. DO NOT INSTALL TYPE MC CABLE FROM FIXTURE TO FIXTURE UNLESS A SPECIAL PROPERLY LISTED AND LABELED UL APPROVED SYSTEM IS SPECIFICALLY INDICATED.

8.9.2. PROVIDE FOR NEW 15 AND 20 AMPERE BRANCH CIRCUIT DROPS TO OUTLETS IN EXISTING HOLLOW PARTITIONS FOR REMODELING WORK. THIS APPLIES ONLY UNDER ALL OF THE FOLLOWING CIRCUMSTANCES AND CONDITIONS:

8.9.2.1. BASIS OF DESIGN INCLUDES CUTTING AND PATCHING FOR SUCH APPLICATIONS. TYPE MC CABLE MAY BE USED ONLY WHERE OWNER OR ARCHITECT SPECIFICALLY DIRECTS INSTALLER CASE-BY-CASE NOT TO SLOT WALLS (LIMITED TO 10 FEET MAXIMUM CABLE LENGTH FROM OVERHEAD CONDUIT SYSTEM JUNCTION BOX TO RESPECTIVE WALL OUTLET BOX); PROVIDE ONLY WHERE CONCEALED (INSTALL WIRING FOR EXPOSED APPLICATIONS IN RACEWAY).

8.10. RACEWAY FITTINGS

8.10.1. FITTINGS FOR EMT SHALL BE STEEL SET SCREW OR COMPRESSION TYPE WITH FACTORY INSTALLED INSULATED THROAT CONNECTORS. DIE CAST OR POT METAL FITTINGS ARE NOT ACCEPTABLE.

8.10.2. FITTINGS FOR FLEXIBLE CONDUIT SHALL BE STEEL OR CAST IRON.

8.10.3. FITTINGS FOR RIGID CONDUIT SHALL BE STEEL THREADED TYPE.

8.10.4. FITTINGS FOR PVC SHALL BE SCHEDULE 40 GLUE-ON TYPE.

8.11. INSTALLATION OF RACEWAYS

8.11.1. PROVIDE ALL CONDUITS CONCEALED, EXCEPT IN EQUIPMENT ROOM, CHASES OR AS INDICATED ON THE DRAWINGS. ALL CONDUITS, EXPOSED AND CONCEALED SHALL BE RUN PARALLEL AND PERPENDICULAR TO BUILDING LINES AND GROUPED TOGETHER AS MUCH AS POSSIBLE, EVEN ABOVE LAY-IN CEILINGS.

8.11.2. HOLD ROUTING OF NEW RACEWAYS IN NEW AND EXISTING BUILDINGS AS TIGHTLY AS POSSIBLE TO THE STRUCTURE ABOVE. OBTAIN APPROVAL OF OWNER'S REPRESENTATIVE PRIOR TO INSTALLATION. DO NOT INSTALL ANY ELECTRICAL WORK WITHIN 6 INCHES OF ROOF DECKING.

8.11.3. CONDUIT SHALL BE CLEANED INSIDE BEFORE ANY WIRES ARE PULLED. CONDUIT ENDS SHALL BE CAPPED AND PLUGGED WITH STANDARD ACCESSORIES AS SOON AS CONDUIT HAS BEEN PERMANENTLY INSTALLED. ALL RACEWAYS SHALL BE ENTIRELY FREE OF PLASTER, MORTAR, WATER AND OTHER FOREIGN MATTER BEFORE INSTALLING CONDUCTORS OR CABLES.

8.11.4. A SEPARATE GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL RUNS. WHERE SIZES LARGER THAN #12 AWG ARE REQUIRED BY THE NEC, THE CONDUCTOR SHALL BE SIZED AS INDICATED IN THE NEC. ALL GROUNDING CONDUCTORS SHALL HAVE A GREEN OUTER COVERING, OR GREEN MARKING TAPE OVER THEIR ENTIRE EXPOSED LENGTHS.

8.11.5. ALL JOINTS SHALL BE MADE TIGHT WITH WATERTIGHT COUPLINGS MATCHING CONDUIT AND ALL CORNERS SHALL BE MADE WITH LONG RADIUS ELBOWS. THE ENDS OF ALL CONDUITS SHALL BE CUT SQUARE AND REAMED AND ALL JOINTS BROUGHT TO A SHOULDER. CONDUIT SHALL BE CONTINUOUS BETWEEN OUTLETS LO MAKE A COMPLETE INSTALLATION AND TO PROVIDE A CONTINUOUS GROUND.

8.11.6. MECHANICALLY FASTEN TOGETHER METAL CONDUITS, ENCLOSURES, AND RACEWAYS FOR CONDUCTORS TO FORM A CONTINUOUS ELECTRICAL CONDUCTOR. CONNECT BONDS TO ELECTRICAL BOXES, FITTINGS AND CABINETS TO PROVIDE ELECTRICAL CONTINUITY AND FIRM MECHANICAL ASSEMBLY.

8.11.7. AVOID USE OF DISSIMILAR METALS THROUGH SYSTEM TO ELIMINATE POSSIBILITY OF ELECTROLYSIS.

8.11.8. PROVIDE EXPANSION FITTINGS IN RACEWAYS EVERY 200' LINEAR RUN OR WHEREVER STRUCTURAL EXPANSION JOINTS ARE CROSSED.

8.11.9. PROVIDE NYLON PULL CORD IN ALL EMPTY CONDUITS. (MINIMUM 90# TENSILE STRENGTH).

8.11.10. CONDUIT INSTALLATION (EXCEPT AS NOTED) USE:

8.11.10.1. RIGID METAL CONDUIT (RMC) FOR ALL WEATHER EXPOSED WORK, FOR ALL STUB-UPS IN WET/DAMP AREAS, FOR ALL ROOF PENETRATIONS AND FOR ANY FREEZER/ COOLER PENETRATIONS.

8.11.10.2. E.M.T. FOR ALL INTERIOR CONCEALED AND FOR INTERIOR EXPOSED WORK NOT SUBJECT TO MECHANICAL INJURY.

8.11.10.3. P.V.C. FOR ALL UNDERGROUND WORK OR WORK INSTALLED IN CONCRETE AND USE RIGID METAL CONDUIT ELBOW AT STUB-UP LOCATIONS.

8.11.10.4. FLEXIBLE METAL CONDUIT FROM OUTLET BOXES TO RECESSED LIGHTING FIXTURE AND FINAL 24" OF CONNECTION TO ITEMS SUBJECT TO MOVEMENT OR VIBRATION.

8.11.10.5. LIQUID-TIGHT FLEXIBLE CONDUIT FOR FINAL 24" CONNECTION TO ITEMS WHERE SUBJECTED TO ONE OR MORE OF THE FOLLOWING CONDITIONS:

8.11.10.5.1. EXTERIOR LOCATION.

8.11.10.5.2. MOIST OR HUMID ATMOSPHERE WHERE CONDENSATE CAN BE EXPECTED TO ACCUMULATE.

8.11.10.5.3. CORROSIVE ATMOSPHERE.

8.11.10.5.4. SUBJECTED TO WATER SPRAY OR DRIPPING OIL, WATER OR GREASE.

8.11.10.5.5. FINAL CONNECTION TO ROTATING OR VIBRATING EQUIPMENT.

8.11.11. CUT CONDUITS STRAIGHT, PROPERLY REAM AND CUT THREADS FOR HEAVY WALL CONDUIT DEEP AND CLEAN INTERIOR AND EXTERIOR THREADS, FIELD GALVANIZE THREADS WITH APPROVED COMPOUND FOR THE PURPOSE.

8.11.12. ONLY INSTALL CONDUIT EXPOSED ON ROOFTOPS WHEN IT IS IMPOSSIBLE TO DO OTHERWISE, OR ONLY IF SPECIFICALLY INDICATED FOR SUCH INSTALLATION CASE-BY-CASE ELSEWHERE IN DOCUMENTS. INSTALLATION CONVENIENCE, FINANCIAL CONSIDERATIONS, LACK OF COORDINATION WITH OTHER TRADES AND SIMILAR RATIONALE ARE NOT SUFFICIENT REASONS FOR DOING SO.

8.11.12.1. IN CASES WHERE CONDUITS MUST BE INSTALLED ON ROOFTOPS, DE-RATE CONDUCTORS AND MODIFY CONDUIT SIZES AS NEEDED TO ACCOMMODATE THIS CONDITION.

8.11.12.2. PROVIDE EXPANSION FITTINGS, WHICH ARE UL LISTED AND LABELED FOR THE RESPECTIVE APPLICATIONS, AT ALL BUILDING EXPANSION JOINTS AND AT MAXIMUM DISTANCES OF 100 FEET.

8.11.12.3. PAINT ALL SUCH CONDUITS WITH AT LEAST TWO COATS OF UV-RESISTANT WEATHERPROOF PAINT. PROVIDE WHITE PAINT ON FLAT ROOFTOPS THAT HAVE FINISHES WHITE IN COLOR, AND FOR OTHERWISE-COLORED ROOF FINISHES THAT ARE NOT VISIBLE FROM THE BUILDING INTERIOR OR FROM THE GROUND OUTDOORS. ELSEWHERE SELECT COLORS TO MATCH SURROUNDING SURFACES. SUBMIT COLORS TO ARCHITECT FOR REVIEW IN ADVANCE OF PROCURING PAINT.

8.11.13. CONDUITS PASSING THROUGH STRUCTURAL MEMBERS SHALL BE PROVIDED WITH STUB AND COUPLING OR SLEEVE IN THE MEMBER.

8.11.14. WHERE MOISTURE CONDITIONS ARE ENCOUNTERED, A HOLE SHALL BE DRILLED AT THE LOWEST POINT IN THE CONDUIT RUN.

8.11.15. OVERHEAD ELECTRIC WORK: INSTALL WORK SO THAT NO RACEWAY OR CABLE IS WITHIN SIX INCHES BELOW ROOF DECK(S). SUSPEND AND SUPPORT OVERHEAD ELECTRICAL WORK FROM ROOF TRUSSES AND JOISTS/JOIST GIRDERS ONLY AT PANEL POINTS, AT TOP CORD ONLY, UNLESS OTHERWISE INDICATED.

8.11.15.1. STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LBS.

9. HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

9.1. PROVIDE SUPPORIS FOR MULIIPLE RACEWAYS CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, EQUIPMENT, CONNECTED SYSTEMS AND ASSOCIATED COMPONENTS/CONTENTS. PROVIDE SUPPORTS ADEQUATE IN TENSION, SHEAR, AND PULLOUT FORCE TO RESIST MAXIMUM LOADS CALCULATED OR IMPOSED FOR THIS PROJECT, WITH A MINIMUM STRUCTURAL SAFETY FACTOR OF FIVE TIMES THE APPLIED FORCE.

9.2. IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO SUPERVISE THE INSTALLATION OF AND PAY FOR ALL ADDITIONAL MATERIAL, WOOD OR METAL, AND LABOR WHICH MAY BE REQUIRED TO SUPPORT ANY TYPE OF PERMANENT OR TEMPORARY ELECTRICAL APPARATUS EMPLOYED IN THE EXECUTION OF THE ELECTRICAL CONTRACTOR'S WORK.

9.3. PROVIDE SUPPORTS, ANCHORS, SLEEVES, AND SEALS FURNISHED AS PART OF FACTORY-FABRICATED EQUIPMENT AS REQUIRED.

9.3.1. ALL CONDUIT SHALL BE SUPPORTED INDEPENDENTLY FROM ALL OTHER BUILDING SYSTEMS AND SHALL BE SUPPORTED DIRECTLY FROM STRUCTURAL COMPONENTS.

9.3.2. ELECTRICALLY RELATED WORK SHALL NOT BE SUPPORTED FROM DUCTWORK, DUCTWORK HANGERS, CEILING SUPPORTS. EXISTING CONDUIT SUPPORTS, ETC.

9.4. ALL PARTS AND HARDWARE USED FOR SUPPORT OF EQUIPMENT, CONDUITS AND FITTINGS, SHALL BE GALVANIZED.

9.5. MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE-TYPE SUPPORTS FABRICATED WITH STEEL SLOTTED "KINDORF" CHANNELS, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 50 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO-BOLT CONDUIT CLAMPS, SINGLE-BOLT CONDUIT CLAMPS, OR SINGLE-BOLT CONDUIT CLAMPS USING SPRING FRICTION ACTION FOR RETENTION IN SUPPORT CHANNEL AS APPLICABLE.

9.6. CONDUIT SHALL BE SUPPORTED BY APPROVED STRAPS, FASTENERS AND HANGERS.

9.6.1. HANGERS SHALL BE SUSPENDED FROM THREADED RODS.

9.6.2. PERFORATED STRAPS WILL NOT BE ACCEPTABLE.

9.6.3. FASTENERS SHALL BE LEAD EXPANSION SHIELDS IN BLOCK OR CONCRETE, TOGGLE BOLTS IN HOLLOW WALLS, MACHINE SCREWS ON METAL SURFACES AND WOOD SCREWS ON WOOD CONSTRUCTION,

9.6.4. FASTEN PIPE STRAPS AND HANGERS TO CONCRETE USING INSERTS OR EXPANSION BOLTS AND TO HOLLOW MASONRY USING TOGGLE BOLTS. WOODEN PLUGS AND SHIELDS WILL NOT BE PERMITTED. ALL SUPPORTS IN BAR JOIST CONSTRUCTION SHALL BE ATTACHED TO THE TOP CORD OF THE JOISTS USING SUITABLE CLAMPS APPROVED FOR THE PURPOSE.

9.7. AT BUILDING EXPANSION JOINTS AND WHERE DEFLECTION IS EXPECTED, CONDUITS SHALL BE PROVIDED WITH EXPANSION FITTINGS WITH BONDING JUMPERS.

9.8. USE OF SYNTHETIC OR PLASTIC "TIE-WRAPS", "ZIP TIES", "WIRE LIES" AND SIMILAR PRODUCTS ARE NOT PERMITTED AS A PERMANENT MEANS OF ANCHORING, SECURING, SUPPORTING OR OTHERWISE INSTALLING ANY CABLES, CONDUCTORS, CONDUITS, RACEWAYS, DEVICES, EQUIPMENT OR OTHER ELECTRICAL WORK.

9.9. CUT, FIT, AND PLACE MISCELLANEOUS METAL FABRICATIONS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION TO SUPPORT AND ANCHOR ELECTRICAL MATERIALS AND EQUIPMENT.

9.10. PLACE AND SECURE ANCHORAGE DEVICES. USE SUPPORTED EQUIPMENT MANUFACTURER'S SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.

9.11. CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS: MSS SP-58, TYPE SUITABLE FOR ATTACHED STRUCTURAL ELEMENT.

9.12. THROUGH BOLTS: STRUCTURAL TYPE, HEX HEAD, AND HIGH STRENGTH. COMPLY WITH ASTM A 325.

9.13. TOGGLE BOLTS: ALL-STEEL GALVANIZED SPRINGHEAD TYPE, 3/16" X 4".

9.14. HANGER RODS: THREADED STEEL, GALVANIZED STEEL RODS; 1/2" DIA MIN.

9.14.1. MINIMUM HANGER ROD SIZE FOR RACEWAY: MINIMUM ROD SIZE SHALL BE 1/4 INCH IN DIAMETER.

9.15. CLEVIS HANGERS: GALVANIZED STEEL: WITH 1/2" DIA. HOLE FOR ROUND STEEL ROD,

9.16. GALVANIZED STEEL ROD REDUCING COUPLINGS, 1/2" X 5/8".

9.17. GALVANIZED STEEL CLAMPS; 1/2" ROD SIZE

9.18. GALVANIZED STEEL CLAMPS, 1-1/4" X 3/16" STOCK; 3/8" CROSS BOLT; FLANGE WIDTH 2". HEXAGON NUTS FOR 1/2" ROD SIZE;

9.19. GALVANIZED STEEL LEAD EXPANSION ANCHORS, 1/2".

9.20. STEEL SLOTTED SUPPORT SYSTEMS COMPLY WITH MFMA-4, FACTORY-FABRICATED COMPONENTS FOR FIELD ASSEMBLY.

9.20.1. CONSTRUCT WITH 9/16" DIA. HOLES, NOMINAL 2" O.C. ON TOP SURFACE, WITH STANDARD FACTORY FINISH, AND WITH THE ALL NECESSARY FITTINGS WHICH MATE AND MATCH WITH UCHANNEL.

9.20.2. PROVIDE METALLIC COATINGS THAT ARE HOT-DIP GALVANIZED AFTER FABRICATION AND APPLIED ACCORDING TO MFMA-4.

9.20.3. COMPLY WITH NECA 1 AND NECA 101 UNLESS REQUIREMENTS IN THIS OR OTHER SPECIFICATION SECTIONS ARE STRICTER.

9.21. FOR SUPPORTING RIGID METAL:

9.21.1. RISER CLAMPS: GALVANIZED STEEL; WITH 2 BOLTS AND NUTS, AND 4" EARS.

9.21.2. CLEVIS HANGERS: GALVANIZED STEEL WITH 1/2" DIA. HOLE FOR ROUND STEEL ROD.

9.21.3. TWO-HOLE CONDUIT STRAPS: GALVANIZED STEEL; 3/4" STRAP WIDTH; AND 2-1 /8" BETWEEN CENTER OF SCREW HOLES.

9.21.4. OFFSET CONDUIT CLAMPS: GALVANIZED STEEL.

9.22. SUPPORT FOR CONDUCTORS IN VERTICAL CONDUIT: FACTORY-FABRICATED ASSEMBLY CONSISTING OF THREADED BODY AND INSULATING WEDGING PLUG OR PLUGS FOR NON-ARMORED ELECTRICAL CONDUCTORS OR CABLES IN RISER CONDUITS. PLUGS SHALL HAVE NUMBER, SIZE, AND SHAPE OF CONDUCTOR GRIPPING PIECES AS REQUIRED TO SUIT INDIVIDUAL CONDUCTORS OR CABLES SUPPORTED BODY SHALL BE MALLEABLE IRON.

9.23. MOUNTING TO WOOD:

9.23.1. FASTEN WITH LAG SCREWS OR THROUGH-BOLTS.

9.23.2. SELECT FASTENER SIZES THAT WILL NOT PENETRATE MEMBERS WHERE OPPOSITE SIDE WILL BE EXPOSED TO VIEW OR WILL RECEIVE FINISH MATERIALS.

9.23.3. MAKE TIGHT CONNECTIONS BETWEEN MEMBERS. INSTALL FASTENERS WITHOUT SPLITTING WOOD MEMBERS. ATTACH TO SUBSTRATES AS REQUIRED TO SUPPORT APPLIED LOADS.

9.24. MOUNTING TO NEW CONCRETE: PROVIDE CHANNEL-TYPE CONCRETE INSERTS AND BOLT TO INSERTS, OR PROVIDE EXPANSION ANCHORS FOR APPLICATIONS WHERE INSERTS ARE NOT PRACTICAL.

9.25. MOUNTING TO EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS. INSTEAD OF EXPANSION ANCHORS, POWDER/GAS-ACTUATED DRIVEN THREADED STUDS PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED IN EXISTING STANDARD-WEIGHT CONCRETE 4 INCHES THICK OR GREATER. DO NOT USE FOR ANCHORAGE TO LIGHTWEIGHT-AGGREGATE CONCRETE OR FOR SLABS LESS THAN 4 INCHES THICK. DO NOT USE FOR WORK ANCHORED TO NEWLY INSTALLED CONCRETE. ONLY USE THIS METHOD WHERE OTHER METHODS CANNOT OR SHOULD NOT BE USED, AND ONLY AFTER RECEIVING CASE-BY-CASE PERMISSION FROM OWNER AND DESIGN PROFESSIONALS.

9.26. MOUNTING TO STEEL: WELDED THREADED STUDS COMPLYING WITH AWS D11/D1 TM, WITH LOCK WASHERS AND NUTS, OR BEAM CLAMPS (MSS TYPE 19, 21 , 23, 25, OR 27) COMPLYING WITH MSS SP-69, CLAMPED TO FLANGES OF BEAMS OR ON UPPER TRUSS CHORDS OF BAR JOISTS.

9.27. ITEMS MOUNTED ON HOLLOW WALLS AND NONSTRUCTURAL BUILDING SURFACES: MOUNT CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES ON SLOTTED-CHANNEL RACKS ATTACHED TO SUBSTRATE.

9.28. FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES: WELDED OR BOLTED, STRUCTURAL-STEEL SHAPES, SHOP OR FIELD FABRICATED TO FIT DIMENSIONS OF SUPPORTED EQUIPMENT.

9.29. ROOF DECKS: DO NOT SUSPEND OVERHEAD HANGERS, OR SUPPORT ANY OTHER OVERHEAD ELECTRICAL WORK, FROM ROOF DECKS.

9.30. ACCESS DOORS.

9.30.1. DO NOT USE ACCESS DOORS UNLESS SPECIAL PRIOR WRITTEN PERMISSION IS GRANTED FROM THE OWNER'S REPRESENTATIVE.

9.30.2. INSTALL PULL BOXES, JUNCTION BOXES, ETC. IN AREAS WHICH ARE ACCESSIBLE AFTER COMPLETION OF CONSTRUCTION. DO NOT INSTALL PULL BOXES OR JUNCTION BOXES ABOVE GYPSUM BOARD OR SIMILAR INACCESSIBLE CEILING SYSTEMS.

9.30.3. WHERE THERE IS NO OTHER RECOURSE BUT TO PROVIDE AN ACCESS DOOR/PANEL, AND WHERE APPROVAL OF OWNER'S REPRESENTATIVE HAS BEEN OBTAINED, PROVIDE REQUIRED ACCESS DOORS/PANELS AS REQUIRED FOR A COMPLETE CODE-COMPLIANT ELECTRICAL INSTALLATION.

9.30.4. PROVIDE ACCESS DOORS IN FIRE/SMOKE RATINGS THAT MEET OR EXCEED THE SURROUNDING SURFACE THAT IS BEING PENETRATED.

10. CONDUCTORS

10.1. BUILDING WIRE, UNLESS OTHERWISE INDICATED, SHALL BE 600 VOLT, TYPE THHN/THWN/THWN-2 INSULATION FOR INTERIOR USE AND EXTERIOR USE WITHIN CONDUIT. PROVIDE TYPE XHHW-2 INSULATION FOR ALL WIRING BELOW GRADE. CONDUCTORS SHALL BE SIZED AND RUN AS INDICATED.

10.2. CONDUCTORS SHALL BE SOFT DRAWN COPPER OF NOT LESS THAN 98% CONDUCTIVITY.

10.3. NO WIRE SMALLER THAN NUMBER TWELVE (12) AWG SHALL BE USED UNLESS OTHERWISE INDICATED. USE OF #14 COLOR CODED WIRE WILL BE ALLOWED FOR CONTROL CIRCUITS ONLY.

10.4. CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND FROM TERMINAL BOARD TO POINT OF FINAL CONNECTION, AND NO SPLICE SHALL BE MADE EXCEPT WITHIN OUTLET OR JUNCTION BOXES.

10.5. KEEP CONDUCTOR SPLICES TO MINIMUM.

10.6. PULL CONDUCTORS SIMULTANEOUSLY WHERE MORE THAN ONE IS BEING INSTALLED IN SAME RACEWAY. USE UL LISTED PULLING COMPOUND OR LUBRICANT.

10.7. WHERE NECESSARY INCREASE WIRE SIZES TO OFFSET VOLTAGE DROP AS/IF REQUIRED.

10.8. ALL CONDUCTORS SHALL BE RATED FOR 90 DEG. C. MAXIMUM. PROVIDE WITH FULL PARITY SIZED GREEN INSULATED EQUIPMENT GROUND CONDUCTOR. PROVIDE COMPATIBLE STEEL FITTINGS WITH INTEGRAL RED PLASTIC INSULATED THROAT BUSHINGS. CABLES SHALL BE 90 DEG. C. RATED WITH ALL COMPONENTS AND FITTINGS LISTED FOR GROUNDING AND COMPLIANT WITH THE FOLLOWING: UL STD.4 AND UL STD. 83;ANSI E119 AND E814; NFPA 70.

10.9. INSULATION VALUE OF JOINTS SHALL BE 100%, IN EXCESS OF WIRE. PROVIDE ADEQUATE LENGTH OF CONDUCTORS WITHIN ELECTRICAL ENCLOSURES AND TRAIN THE CONDUCTORS TO TERMINAL POINTS WITH NO EXCESS.

10.10. BUNDLE MULTIPLE CONDUCTORS, WITH CONDUCTORS NO LARGER THAN 10 AWG CABLED IN INDIVIDUAL CIRCUITS.

10.11. DO NOT USE ARMORED AC, BX, NM, OR ANY MANUFACTURED CABLE ASSEMBLY, UNLESS NOTED OTHERWISE.

10.12. ALL WIRING SHALL BE IN CONDUIT, UNLESS NOTED OTHERWISE.

10.13. COLOR CODING OF CONDUCTORS SHALL BE AS FOLLOWS FOR VOLTAGES WHEN PRESENT:

10.13.1. 208Y/120V SYSTEMS:

PHASE A - BLACK
PHASE B - RED
PHASE C - BLUE
NEUTRAL - WHITE
GROUND - GREEN

10.14. AWG #10 AND SMALLER SHALL BE SOLID. AWG #8 AND LARGER SHALL BE STRANDED.

10.15. MAINTAIN A UNIFORM ELEVATION FOR ALL CABLE RUNS WHEREVER POSSIBLE. ALL CABLES SHALL BE SUPPORTED/ANCHORED AT MAXIMUM 4 FOOT INTERVALS AND WITHIN 12" OF BOX OR OUTLET AND SHALL NOT SAG.

10.16. INSTALL CABLES IN A MANNER THAT PREVENTS OVERHEATING.

10.17. WIRE CONNECTIONS

10.17.1. FOR EACH ELECTRICAL CONNECTION INDICATED, PROVIDE COMPLETE ASSEMBLY OF MATERIALS, INCLUDING BUT NOT LIMITED TO, PRESSURE CONNECTORS, TERMINALS (LUGS), ELECTRICAL INSULATING TAPE, HEAT-SHRINKABLE INSULATING TUBING, CABLE TIES, SOLDERLESS WIRE-NUTS, AND OTHER ITEMS AND ACCESSORIES AS NEEDED TO COMPLETE SPLICES AND TERMINATIONS OF TYPES INDICATED.

10.17.2. ALL FEEDER AND SUB-FEEDER WIRING CONNECTIONS SHALL BE MADE WITH COMPRESSION CONNECTORS BY SQUARE D OR ACCEPTABLE EQUIVALENT.

10.17.3. ALL BRANCH WIRING CONNECTIONS SHALL BE 3M SCOTCH LOCK CONNECTORS OR ACCEPTABLE EQUIVALENT.

10.17.4. WHERE CABLE CONNECTIONS REQUIRE INSULATION, SCOTCH #33, ELECTRICAL TAPE SHALL BE USED FOR WRAPPING.

10.17.5. MAKE TERMINATIONS SO THERE IS NO BARE CONDUCTOR AT THE TERMINAL.

10.18. GROUND AND BONDING CONDUCTORS FOR ELECTRICAL SYSTEMS

10.18.1. ALL METALLIC CONDUIT. SURFACE RACEWAYS, WIREWAYS, SUPPORTS, CABINET AND EQUIPMENT SHALL BE GROUNDED.

10.18.2. PROVIDE GROUNDING ELECTRODE CONDUCTORS FOR SERVICE ENTRANCES AND DERIVED SYSTEMS.

10.18.3. PROVIDE ALL FEEDERS AND BRANCH CIRCUITS WITH INSULATED (GREEN COVERING) EQUIPMENT GROUNDING.

10.18.4. DO NOT SHARE NEUTRALS WHEN AMONGST MULTIPLE BRANCH CIRCUITS OR WITH MULTI-WIRE BRANCH CIRCUITS.

10.18.5. UNLESS SPECIFICALLY INDICATED OTHERWISE ON DRAWINGS, PROVIDE GROUNDED ("NEUTRAL") CONDUCTORS THAT ARE AT LEAST COMPARABLY-SIZED WITH CORRESPONDING PHASE CONDUCTORS FOR ALL APPLICATIONS.

10.19. NORMAL SYSTEM POWER FEEDERS AND BRANCH CIRCUITS SHALL BE INSTALLED IN SEPARATE RACEWAYS FROM EMERGENCY SYSTEM POWER. ALL WIRING FOR DIFFERENT POWER VOLTAGES SHALL BE INSTALLED IN RACEWAY SYSTEMS SEPARATE FROM EACH OTHER. ALL WIRING FOR THE VARIOUS ELECTRICAL SYSTEMS SHALL BE INSTALLED IN RACEWAY SYSTEMS SEPARATE FROM EACH OTHER.

11. BOXES AND FITTINGS

11.1. PROVIDE BOXES AND FITTINGS FOR ALL WORK.

11.2. THE OUTLET BOX LOCATIONS INDICATED ON DRAWINGS SHALL BE CONSIDERED APPROXIMATE, AND THEREFORE, IT SHALL BE INCUMBENT UPON CONTRACTOR TO STUDY THE GENERAL CONSTRUCTION WITH RELATION TO SPACES AND EQUIPMENT SURROUNDING EACH OUTLET.

11.3. ALL OUTLET, SWITCH, AND JUNCTION BOXES SHALL BE MADE OF CODE COMPLIANT #12 GAUGE STEEL COMPLETE WITH RINGS AND REMOVABLE FRONT FASTENED SCREW COVER PLATES WITH COUNTER SINK HEAD SCREWS.

11.4. OUTLET BOXES

11.4.1. WHERE CONDUIT IS CONCEALED, BOXES SHALL NOT BE LESS THAN 4" SQUARE X 1-1/2" DEEP.

11.4.2. CEILING: 4" SQUARE, 2-1/8" DEEP FOR EXPOSED OR FURRED WORK, 3" DEEP FOR BOXES POURED IN CONCRETE.

11.4.2.1. PROVIDE CONCRETE POUR BOXES OF THE TYPE SPECIALLY DESIGNED FOR THE APPLICATION.

11.4.2.2. PROVIDE DEEPER BOXES WHERE REQUIRED.

11.4.3. WALL: 4" SQUARE, 2-1/8" DEEP BOXES.

11.4.3.1. PROVIDE EXTENSION RINGS OR COVERS OF SUFFICIENT DEPTH TO BRING COVERS FLUSH WITH THE FINISHED SURFACE.

11.4.4. OUTLET BOXES SHALL BE 4" OCTAGONAL FOR LIGHTING FIXTURES WITH APPROVED PLASTER RINGS AND PLATES.

11.5. EXPOSED AND WET OR DAMP AREA AT EQUIPMENT, SUCH AS EXTERIOR, ROOFS OR KITCHENS WHEN PRESENT, PROVIDE FS OR FD BOXES WITH SUITABLE WEATHERPROOF COVERS.

11.6. PROVIDE COVERS OF "IN USE" TYPE COVERS WHERE CORDS/PLUGS ARE INSTALLED AND MUST REMAIN AS "IN USE".

11.7. PULL AND JUNCTION BOXES

11.7.1. PROVIDE BOXES WHERE REQUIRED TO FACILITATE THE PULLING OF WIRES OR CABLES.

11.7.2. BOXES SHALL BE IN ACCORDANCE WITH ARTICLE 370 OF N.E.C.

11.8. INSTALLATION OF BOXES AND FITTINGS

11.8.1. POSITION RECESSED OUTLET BOXES ACCURATELY TO ALLOW FOR SURFACE FINISH THICKNESS.

11.8.2. FASTEN ELECTRICAL BOXES FIRMLY AND RIGIDLY TO SUBSTRATES OR STRUCTURAL SURFACES TO WHICH ATTACHED OR SOLIDLY EMBED ELECTRICAL BOXES IN CONCRETE OR MASONRY.

11.8.3. ALL BOXES SHALL BE EQUIPPED WITH PROPER COVERS TO BE FLUSH WITH FINISHED WALL SURFACE.

11.8.4. WHERE OUTLET BOXES OCCUR IN BLOCK, CINDER, CONCRETE BLOCK, FACING TILE, OR OTHER MATERIAL WHERE SUCH MATERIALS FORM THE FINISHED WALL SURFACE; THE OPENING FOR THE BOX SHALL BE CUT NEATLY AND OF THE SIZE THAT THE COVER PLATE WILL COVER ALL PARTS OF THE OPENING.

11.9. LOCATIONS OF OUTLETS

11.9.1. CONTRACTOR SHALL STUDY THE ARCHITECTURAL AND ELECTRICAL DRAWINGS FOR EXACT LOCATIONS COORDINATED WITH DOOR SWINGS, GLASS PARTITIONS, ETC. VERIFY ALL BOX/DEVICE MOUNTING HEIGHTS AND LOCATIONS IN FIELD WITH OWNERS REPRESENTATIVE. THE VARIOUS OUTLETS ARE TO BE LOCATED AT THE FOLLOWING HEIGHTS ABOVE FINISHED FLOOR TO THE CENTER LINE OF BOX, UNLESS NOTED OTHERWISE AT AN INDIVIDUAL OUTLET ON THE DRAWINGS, WHEN SCHEDULED, OR IN CASES WHERE USING CENTER OF BOX FOR MEASUREMENT WOULD RESULT IN A DEVICE HAVING AN OPERABLE COMPONENT HIGHER THAN 48 INCHES ABOVE FINISHED FLOOR, INSTALL BOXES LOWER AS NEEDED SO THAT UPPERMOST PART OF OPERABLE COMPONENT IS NO HIGHER THAN 48 INCHES. VERIFY ALL EQUIPMENT REQUIREMENTS BEFORE ROUGH-IN:

11.9.1.1.	WALL SWITCHES & PULL STATIONS (VERT. MTD.)	48"
11.9.1.2.	RECEPTACLES (VERT. MTD.)	18"
11.9.1.3.	TELEPHONE OUTLETS (DESK PHONE)	18"
11.9.1.4.	TELEPHONE OUTLETS (WALL PHONE)	46"
11.9.1.5.	DATA CABLE OUTLETS	18"
11.9.1.6.	OUTLETS ABOVE COUNTERS (HORZ. MTD.)	6" ABOVE BACKSPLASH
11.9.1.7.	FIRE ALARM HORNS/STROBES TO TOP OF DEVICE.	80" MIN TO 84" MAX

NO	DATE	REMARKS
⚠	3/31/2025	BUILDING COMMENTS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E402
ELECTRICAL SPECIFICATIONS

CHECKED: NYE DRAWN: NYE

DIVISION 26- ELECTRICAL SPECIFICATIONS

12. ELECTRICAL SYSTEM GROUNDING

12.1. MAIN SERVICE GROUNDING SYSTEM SHALL CONSIST OF THREE BRANCHES.

12.1.1. GROUNDING CONDUCTOR TO THE WATER PIPING SYSTEM WHICH SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

12.1.2. GROUNDING CONDUCTOR TO THE CONCRETE FOOTING REINFORCING/BUILDING REINFORCING STEEL.

12.1.3. GROUNDING CONDUCTOR TO THE ELECTRODE GROUNDING SYSTEM (DRIVEN GROUND RODS) WHICH SHALL BE SIZED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.

12.2. GROUNDING CONDUCTOR SHALL BE BONDED AT BOTH ENDS TO THE CONDUIT IN WHICH IT IS INSTALLED.

12.3. MAIN SERVICE GROUND TO THE WATER PIPING SYSTEM SHALL BE CONNECTED ON THE STREET SIDE OF THE WATER METER, OR ON A COLD WATER PIPE AS NEAR AS PRACTICABLE TO THE WATER SERVICE ENTRANCE TO THE BUILDING.

12.4. BONDING JUMPERS SHALL BE PROVIDED WHERE REQUIRED BY THE NATIONAL ELECTRICAL CODE.

12.4.1. BOND ALL STRUCTURAL STEEL OF THE BUILDING TO THE MAIN SERVICE GROUND BUS.

12.4.2. BOND THE NATURAL GAS SERVICE TO THE GROUND ELECTRODE SYSTEM.

12.5. PROVIDE EQUIPMENT GROUNDING CONDUCTORS IN ALL RACEWAYS AND CABLES SIZED IN ACCORDANCE WITH THE NEC.

13. WIRING DEVICES

13.1. THE EXTENT OF WIRING DEVICE WORK IS INDICATED BY THE DRAWINGS AND SCHEDULES. COORDINATE PLATE COLORS WITH ARCHITECTURAL REQUIREMENTS.

13.2. PROVIDE WIRING DEVICES WHICH ARE U.L. LISTED AND LABELED.

13.3. ACCEPTABLE MANUFACTURERS

13.3.1. HARVEY HUBBELL CO.

13.3.2. LEGRAND-PASS AND SEYMOUR.

13.3.3. LEVITON MFG. CO.

13.4. FABRICATED WIRING DEVICES

13.4.1. SWITCHES SHALL BE SPECIFICATION GRADE, BACK & SIDE WIRED, RATED 20 AMP. 120/208 VOLT, 1 HP @ 120V, A.G. QUIET TYPE, HUBBELL #1221 – IVORY OR BROWN, COLOR AS DESCRIBED AND/OR SELECTED BY ARCHITECT TO MATCH FINISHES.

13.4.1.1. SNAP SWITCHES

13.4.1.1.1. COMPLY WITH NEMA WD 1 AND UL 20. SILENT MECHANICAL TYPE.

13.4.1.1.2. THREE AND FOUR-WAY SWITCHES SHALL BE OF THE SAME MANUFACTURER AND GRADE.

13.4.1.2. PILOT LIGHT SWITCHES, 20 A:

13.4.1.2.1. SINGLE POLE, WITH NEON-LIGHTED HANDLE, ILLUMINATED WHEN SWITCH IS "ON."

13.4.1.3. SINGLE-POLE, DOUBLE-THROW, MOMENTARY CONTACT, CENTER-OFF SWITCHES, 120/277 V, 20 A; FOR USE WITH MECHANICALLY HELD LIGHTING CONTACTORS.

13.4.1.4. WALL-BOX DIMMERS

13.4.1.4.1. DIMMER SWITCHES: MODULAR, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES, WITH AUDIBLE FREQUENCY AND EMI/RFI SUPPRESSION FILTERS.

13.4.1.4.2. CONTROL: CONTINUOUSLY ADJUSTABLE SLIDER, TOGGLE SWITCH, OR ROTARY KNOB; WITH SINGLE-POLE OR THREE-WAY SWITCHING. COMPLY WITH UL 1472.

13.4.1.4.3. INCANDESCENT LAMP DIMMERS: 120 V; CONTROL SHALL FOLLOW SQUARE-LAW DIMMING CURVE. ON-OFF SWITCH POSITIONS SHALL BYPASS DIMMER MODULE.

13.4.1.4.4. 600 W; DIMMERS SHALL REQUIRE NO DERATING WHEN GANGED WITH OTHER DEVICES. ILLUMINATED WHEN "OFF."

13.4.2. FAN SPEED CONTROLS

13.4.2.1. MODULAR, 120-V, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES AND AUDIBLE FREQUENCY AND EMI/RFI FILTERS.

13.4.2.1.1. COMPLY WITH UL 1917

13.4.2.1.2. CONTINUOUSLY ADJUSTABLE SLIDER, TOGGLE SWITCH, OR ROTARY KNOB, 5 A OR 1.5 A.

13.4.2.1.3. THREE-SPEED ADJUSTABLE SLIDER OR ROTARY KNOB, 1.5 A.

13.4.3. OCCUPANCY SENSORS

13.4.3.1. LONG-RANGE WALL-SWITCH SENSORS:

13.4.3.1.1. DUAL TECHNOLOGY, WITH BOTH PASSIVE-INFRARED- AND ULTRASONIC-TYPE SENSING, 120/277 V, ADJUSTABLE TIME DELAY UP TO 30 MINUTES, 110-DEGREE FIELD OF VIEW, AND A MINIMUM COVERAGE AREA OF 1200 SQ. FT.

13.4.4. RECEPTACLES SHALL BE HEAVY DUTY GROUNDING TYPE, 20 AMP 125 VOLT RATED, HUBBELL #5362 – IVORY OR BROWN, AND/OR SELECTED BY ARCHITECT TO MATCH FINISHES. FOR OTHER TYPES/STYLES ETC, AND APPLICATIONS SEE DRAWINGS.

13.4.4.1. GFCI RECEPTACLES – STRAIGHT BLADE, FEED OR NON-FEED THROUGH TYPE. COMPLY WITH NEMA WD 1, NEMA WD 6, UL 498, AND UL 943, CLASS A, AND INCLUDE INDICATOR LIGHT THAT IS LIGHTED WHEN DEVICE IS TRIPPED.

13.4.5. COMMUNICATIONS OUTLETS

13.4.5.1. TELEPHONE OUTLET – SINGLE RJ-45 JACK FOR TERMINATING 100-OHM, BALANCED, FOUR-PAIR UTP; TIA/EIA-568-B.1 COMPLYING WITH CATEGORY 5E. COMPLY WITH UL 1863.

13.4.5.2. COMBINATION TV AND TELEPHONE OUTLET – SINGLE RJ-45 JACK FOR 100-OHM, BALANCED, FOUR-PAIR UTP; TIA/EIA-568-B.1; COMPLYING WITH CATEGORY 5E; AND ONE TYPE F COAXIAL CABLE CONNECTOR.

13.4.6. UNLESS SPECIFICALLY INDICATED OTHERWISE, OR DIRECTED OTHERWISE IN FIELD, PROVIDE ALMOND COLOR FOR NORMAL UTILITY WIRING DEVICES.

13.5. PROVIDE SMOOTH FINISH PLATES FOR ALL DEVICES WITH APPROPRIATE MOUNTING ARRANGEMENTS FOR GAUGED DEVICES.

13.5.1. FOR TELEPHONE, COMPUTER, AND MICROPHONE OUTLETS PROVIDE BUSHED HOLE COVER PLATES.

13.5.2. PLATES SHALL BE IVORY, BROWN, OR GRAY STAINLESS STEEL.

13.5.2.1. WALL PLATES IN FINISHED AREAS SHALL BE COMMERCIAL SPECIFICATION GRADE, SATIN FINISH STAINLESS STEEL, WITH BEVELED EDGES, EQUAL TO LEVITON TYPE 430 SERIES.

13.5.3. GRAY STAINLESS STEEL PLATES FOR SERVICE AREAS, KITCHEN STORAGE, AND RESTROOMS.

13.5.4. IVORY DEVICES WHERE 302 STAINLESS STEEL OR IVORY PLATES ARE USED.

13.5.5. IVORY PLATES FOR ALL OTHER AREAS EXCEPT BROWN PLATES ON WOOD OR DARK SURFACES.

13.5.5.1. BROWN DEVICES WHERE BROWN PLATES ARE USED.

13.5.6. PROVIDE WALL PLATES WITH ENGRAVED LEGENDS WHERE INDICATED ON DRAWINGS AND/OR WHERE REQUIRED.

13.5.7. MATERIAL FOR DAMP LOCATIONS – THERMOPLASTIC OR CAST ALUMINUM WITH SPRING-LOADED LIFT COVER, AND LISTED AND LABELED FOR USE IN "WET LOCATIONS."

13.5.8. WET-LOCATION, WEATHERPROOF COVER PLATES – NEMA 250, COMPLYING WITH TYPE 3R WEATHER-RESISTANT, DIE-CAST ALUMINUM OR THERMOPLASTIC WITH HINGED LOCKABLE COVER.

13.5.9. REFER TO ARCHITECTURAL FINISH SCHEDULES AND OWNER REPRESENTATIVE FOR ADDITIONAL INFORMATION.

13.6. FLOOR SERVICE FITTINGS

13.6.1. TYPE – MODULAR, FLUSH-TYPE, FLAP-TYPE, OR ABOVE-FLOOR, DUAL-SERVICE UNITS SUITABLE FOR WIRING METHOD USED.

13.6.2. COMPARTMENTS – BARRIER SEPARATES POWER FROM VOICE AND DATA COMMUNICATION CABLING.

13.6.3. SERVICE PLATE – RECTANGULAR OR ROUND, DIE-CAST ALUMINUM OR SOLID BRASS WITH SATIN FINISH.

13.7. PROVIDE GROUNDED ("NEUTRAL") CONDUCTORS IN ALL WALL SWITCH, DIMMER, AND OTHER LIGHTING CONTROL OUTLET BOXES, EVEN IF NOT IMMEDIATELY UTILIZED.

13.8. ALL DEVICE WALL PLATES SHALL BE STANDARD SIZE: "MIDWAY", "OVERSIZED" ("JUMBO") OR "EXTRA DEEP" WALL PLATES SHALL NOT BE ACCEPTABLE.

13.9. SCREW HEADS COLORED TO MATCH FINISH OF PLATES.

13.10. GROUND, PHASE AND NEUTRAL CONDUCTORS SHALL BE PIG-TAILED IN OUTLET BOXES, OR MULTI-OUTLET ASSEMBLY FOR RECEPTACLES, SO THAT GROUND AND ELECTRICAL SERVICE WILL NOT BE DISTURBED DUE TO OTHER RECEPTACLES ON THE SAME MULTI-WIRE CIRCUIT IF RECEPTACLE IS REMOVED.

14. PANEL BOARDS

14.1. PROVIDE PANELS MATCHING VOLTAGES, PHASE AND WIRES AS NOTED ON THE PANEL SCHEDULES.

14.2. AS A BASIS OF DESIGN, USE SQUARE-D TYPE "NQ", "NF" UNLESS OTHERWISE NOTED ON THE PANEL SCHEDULE OR AS A NOTE ASSOCIATED WITH THE PANEL.

14.3. ACCEPTABLE MANUFACTURERS

14.3.1. SQUARE D CO. (BOLT ON BREAKERS)

14.3.2. SIEMENS (BOLT ON BREAKERS)

14.3.3. EATON/CUTLER HAMMER (BOLT ON BREAKERS)

14.4. PROVIDE DEAD-FRONT, SAFETY CONSTRUCTED, FACTORY-ASSEMBLED CIRCUIT BREAKER TYPE PANEL BOARDS IN SIZES AND RATINGS AS INDICATED.

14.4.1. ALL PANEL BOARDS INTERIORS SHALL BE FACTORY ASSEMBLED COMPLETE WITH CIRCUIT BREAKERS AS SCHEDULED ON THE DRAWINGS. ALL CIRCUIT BREAKERS SHALL BE QUICK-MAKE AND SHALL BE TRIP INDICATING.

14.4.2. EACH BOLT-ON PANEL BOARD SHALL BE PROVIDED WITH AN EQUIPMENT GROUND BUS BONDED TO THE PANEL BACK BOX. IN ADDITION, PROVIDE 200% NEUTRAL BUS AND ISOLATED GROUND BUS WHERE INDICATED.

14.4.3. EQUIP PANEL BOARD UNIT DEVICES WITH TYPES, RATINGS, AND CHARACTERISTICS INDICATED.

14.4.4. BUS STRUCTURE AND MAIN LUGS OR MAIN BREAKER SHALL HAVE CURRENT RATINGS AS SHOWN ON THE PANEL BOARD SCHEDULE.

14.4.4.1. SUCH RATINGS SHALL BE ESTABLISHED BY TEST CONDUCTED IN ACCORDANCE WITH UNDERWRITERS LABORATORIES STANDARD UL 67. THE USE OF CONDUCTOR DIMENSIONS WILL NOT BE ACCEPTED IN LIEU OF ACTUAL HEAT TEST.

14.4.5. BUS BAR CONNECTIONS TO THE BRANCH CIRCUIT BREAKERS SHALL BE "PHASE-SEQUENCE" TYPE.

14.4.6. THREE-PHASE, FOUR WIRE BUSSING SHALL BE SUCH THAT ANY THREE ADJACENT SINGLE-POLE BREAKERS ARE INDIVIDUALLY CONNECTED TO EACH OF THE THREE DIFFERENT PHASES IN SUCH A MANNER THAT TWO OR THREE-POLE BREAKERS CAN BE INSTALLED AT ANY LOCATION.

14.4.7. ALL CURRENT CARRYING PARTS OF THE BUSS ASSEMBLY SHALL BE PLATED COPPER WITH CONDUCTIVITY OF NOT LESS THAN 98%.

14.5. PANEL BOARD ENCLOSURE

14.5.1. PROVIDE GALVANIZED SHEET STEEL CABINET TYPE ENCLOSURES, IN SIZES AND NEMA TYPES AS INDICATED, CODE GAUGE MINIMUM 16-GAUGE THICKNESS.

14.5.2. ENCLOSURES SHALL BE SURFACE MOUNTED UNLESS OTHERWISE INDICATED.

14.5.3. PANEL BOARDS AND ENCLOSING CABINETS SHALL CONFORM TO STANDARDS ESTABLISHED BY UNDERWRITERS' LABORATORIES, INC., AND REQUIREMENTS OF THE NEC.

14.5.4. CONSTRUCT WITH MULTIPLE KNOCKOUTS AND WIRING GUTTERS.

14.5.5. PROVIDE FRONTS WITH ADJUSTABLE TRIM CLAMPS, AND DOORS WITH FLUSH LOCKS AND KEYS, ALL PANEL BOARD ENCLOSURES KEYED ALIKE WITH CONCEALED PIANO DOOR HINGES.

14.5.6. EQUIP WITH INTERIOR CIRCUIT DIRECTORY FRAME, AND CARD WITH CLEAR PLASTIC COVERING.

14.5.7. PROVIDE BAKED GRAY ENAMEL FINISH OVER A RUST INHIBITOR COATING.

14.5.8. PROVIDE ENCLOSURES FABRICATED BY SAME MANUFACTURER AS PANELBOARDS.

14.5.9. MINIMUM DEPTH OF 5-3/4" & MINIMUM WIDTH OF 20" FOR PANELS.

14.6. BALANCE AMPERES OF CIRCUITS AFTER ACTIVE LOADS ARE ENERGIZED TO WITHIN 10% MAXIMUM AND PROVIDE TYPEWRITTEN PANEL BOARD SCHEDULE WITH CORRECTED LOADS.

14.7. PROVIDE PANEL BOARD WITH CIRCUIT BREAKERS HAVING THE SHORT CIRCUIT RATING (SCCR) INDICATED.

14.7.1. PROVIDE CIRCUIT BREAKERS HAVING THE AIC RATING INDICATED AND IF THE PANEL BOARD IS "SERIES RATED", MANUFACTURER SHALL PROVIDE LABELING REQUIRED BY N.E.C. RELATIVE TO THIS RATING.AND SHALL SUBMIT DATA WITH THE PANEL BOARD AND CIRCUIT BREAKER SUBMITTAL.

15. MOTOR LOAD CONNECTIONS

15.1. PROVIDE ALL POWER WIRING AND CONNECTIONS FROM SOURCE TO STARTER, STARTER TO DISCONNECT, AND DISCONNECT TO MOTOR OR DEVICE, EXCEPT WHERE SUCH WIRING IS PROVIDED BY EQUIPMENT MANUFACTURER.

15.2. ALL AUTOMATIC TEMPERATURE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23 – MECHANICAL, UNLESS INDICATED OR SPECIFIED OTHERWISE. HOWEVER, ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL STARTERS AND MAKE ALL POWER CONNECTIONS.

15.3. MANUAL CONTROL SWITCHES SHALL BE FURNISHED AND/OR INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED.

15.4. FURNISH AND INSTALL A DISCONNECT FOR EACH MOTOR (UNLESS PROVIDED INTEGRAL BY MANUFACTURER).

15.5. DISCONNECTS SHALL BE FUSED OR UNFUSED SAFETY SWITCHES AS REQUIRED.

15.6. UPON COMPLETION OF MOTOR INSTALLATION WORK, CONTRACTOR SHALL ENSURE PHASES ARE CORRECTLY CONNECTED BY CHECKING ROTATION OF MOTOR.

15.7. PROVIDE INHERENT THERMAL PROTECTION FOR ALL FRACTIONAL HORSEPOWER MOTORS.

15.8. DISCONNECT SWITCHES AND SAFETY SWITCHES

15.8.1. ACCEPTABLE MANUFACTURERS

15.8.1.1. SQUARE D COMPANY

15.8.1.2. EATON-CUTLER HAMMER

15.8.1.3. SIEMENS

15.8.2. FURNISH AND INSTALL SAFETY SWITCHES WHERE INDICATED AND AS REQUIRED FOR MOTOR OUTLETS OR OTHER EQUIPMENT. SWITCHES SHALL BE OF SIZE, NUMBER OF POLES AND FUSED OR NON-FUSED, AS REQUIRED FOR JOB CONDITIONS AND THE NATIONAL ELECTRICAL CODE.

15.8.3. PROVIDE SWITCHES WITH ELECTRICAL CHARACTERISTICS INDICATED:

15.8.3.1. SWITCHES SHALL BE EQUIPPED WITH FUSE CONTACTS AND JAWS WHICH INSURE POSITIVE FUSE AND JAW CONTACT BY MEANS OF REINFORCING SPRING CLIPS OR OTHER APPROVED MEANS.

15.8.3.2. HINGES SHALL BE NON-CURRENT CARRYING.

15.8.3.3. SWITCHES SHALL BE SO DESIGNED THAT THEY CAN BE LOCKED IN EITHER OPEN OR CLOSED POSITION.

15.8.3.4. SWITCHES SHALL HAVE REJECTION CLIP PROVISIONS SO THAT ONLY CLASS RK-1 CURRENT LIMITING FUSES CAN BE INSTALLED.

15.8.3.5. ALL SAFETY SWITCHES SHALL BE QUICK-MAKE, QUICK-BREAK, AND HAVE INTERLOCKING COVER WITH HANDLE THAT MAY EITHER BE FRONT OR SIDE OPERATING.

15.8.3.6. SWITCH BLADE SHALL BE VISIBLE IN OFF POSITION WITH THE DOOR OPEN.

15.8.3.7. EQUIP WITH OPERATING HANDLE THAT IS AN INTEGRAL PART OF ENCLOSURE BASE AND WHOSE OPERATING POSITION IS CLEARLY INDICATED AND IS PADLOCKABLE IN THE OFF POSITION.

15.8.3.8. CONSTRUCT CURRENT CARRYING PARTS OF HIGH-CONDUCTIVITY COPPER AND SILVER-TUNGSTEN TYPE SWITCH CONTACTS.

15.8.3.9. PROVIDE NEMA TYPE 1 FOR INTERIOR AND NEMA TYPE 3R FOR EXTERIOR AND PROVIDE TYPE INDICATED FOR SPECIAL CASES.

15.8.3.10. PROVIDE FUSIBLE SWITCHES WITH FUSES REQUIRED.

15.8.3.10.1. FUSES SHALL BE U.L. LISTED CLASS RK-1 CURRENT LIMITING TYPE. PROVIDE BUSSMAN "LOW PEAK" OR APPROVED EQUAL.

15.8.4. HEAVY-DUTY SAFETY SWITCHES – PROVIDE SURFACE MOUNTED, HEAVY DUTY TYPE, SHEET STEEL ENCLOSED SWITCHES THAT ARE PAINTED WITH PRIME COATS AND FINAL ENAMEL COATS THAT IS SUITABLE FOR EXPOSURE TO EXTERIOR ELEMENTS WITHOUT CORROSION.

15.9. MOTOR STARTERS

15.9.1. STARTERS AND CONTROL DEVICES FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 26 – ELECTRICAL WHERE SHOWN ON THE DRAWINGS.

15.9.2. UNLESS SPECIFIED OTHERWISE UNDER OTHER DIVISION 23 SPECIFICATIONS, MECHANICAL DRAWINGS, OR INDIVIDUAL EQUIPMENT SECTIONS, MOTOR STARTERS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:

15.9.2.1. STARTERS FOR MOTORS 1/3 HORSEPOWER OR SMALLER SHALL BE MANUAL UNLESS REMOTE OR AUTOMATIC STARTING IS REQUIRED, IN WHICH CASE THE STARTERS SHALL BE MAGNETIC, FULL VOLTAGE, NON-REVERSING, SINGLE-SPEED, UNLESS OTHERWISE INDICATED. ALL OTHER STARTERS SHALL BE MAGNETIC.

15.9.2.2. EACH STARTER FOR A THREE-PHASE MOTOR SHALL BE FURNISHED WITH THREE (3) OVERLOAD RELAYS SIZED FOR THE FULL LOAD RUNNING CURRENT OF THE MOTOR ACTUALLY PROVIDED.

15.9.2.2.1. PROVIDE AN EXTERNAL "HAND-OFF-AUTO SELECTOR SWITCH WITH RED "RUNNING" LIGHT.

15.9.2.2.2. PROVIDE A GREEN LIGHT TO INDICATE MOTOR "STOPPED".

15.9.2.2.3. EACH PILOT LIGHT SHALL HAVE A LEGEND PLATE INDICATING REASON FOR SIGNAL.

15.9.2.3. EACH OVERLOAD RELAY SHALL HAVE A NORMAL OPEN ALARM CONTACT WHICH WILL CLOSE ONLY WHEN ACTUATED BY AN OVERLOAD (NOT TO BE CONFUSED WITH N.O. OR N.C. AUXILIARY CONTACTS). THESE CONTACTS SHALL BE PROPERLY WIRED TO THEIR RESPECTIVE BLUE PILOT LIGHT PROVIDED ON THE STARTER FRONT COVER AND HAVING A "TRIPPED" LEGEND PLATE.

15.9.2.4. INDIVIDUAL MOUNTED MOTOR STARTERS SHALL BE IN A NEMA TYPE 1 GENERAL PURPOSE ENCLOSED IN UNFINISHED AREAS AND SHALL BE FLUSH MOUNTED IN ALL FINISHED AREAS. ALL STARTERS MOUNTED IN EXTERIOR AREAS SHALL HAVE A NEMA 3R ENCLOSURE. EACH STARTER SHALL HAVE A LAMINATED NAMEPLATE TO INDICATE EQUIPMENT UNIT NUMBER, FUNCTION AND CIRCUIT NUMBER.

15.9.2.5. ALL MOTORS STARTERS, PUSH BUTTONS AND PILOT LIGHTS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD.

15.9.3. MOTOR STARTERS FOR THE FOLLOWING EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 23 BY THE MANUFACTURER OF THE EQUIPMENT:

15.9.3.1. PACKAGED AIR CONDITION EQUIPMENT

15.9.3.2. PACKAGED BOOSTER PUMP SYSTEM

15.9.3.3. OTHER EQUIPMENT HEREINAFTER IN OTHER SECTIONS TO BE PROVIDED WITH INTEGRAL STARTERS.

15.10. EQUIPMENT CONNECTION COORDINATION

15.10.1. COORDINATE EXACT LOCATION OF OUTLETS, EQUIPMENT CONNECTIONS, AND REQUIREMENTS PRIOR TO ROUGH-IN AND INSTALLATION OF DEVICES. AS DETERMINED BY THE ACTUAL EQUIPMENT AND FURNITURE LAY OUT. VERIFY WITH FIXTURE PLAN AND EQUIPMENT INSTALLER.

15.10.2. COORDINATE ELECTRICAL REQUIREMENTS OF EQUIPMENT NOT SHOWN ON DETAILS, i.e. ROOF-TOP UNITS, UNIT HEATERS, FANS, ETC., AND EQUIPMENT/DEVICES REQUIRING AN ELECTRICAL CIRCUIT AND CONTROL.

16. LIGHTING FIXTURES

16.1. FURNISH AND INSTALL A COMPLETE LIGHTING FIXTURE FOR EACH LIGHTING FIXTURE SYMBOL SHOWN ON THE DRAWINGS, OF THE TYPE AND QUALITY DESCRIBED HEREIN.

16.1.1. FIXTURES SHALL BE INSTALLED COMPLETE WITH LAMPS OF THE WATTAGE INDICATED, SOCKETS, HOUSING, BALLAST (IF REQUIRED), SHADES, DIFFUSERS, SUPPORTS, ETC., AND WIRED FOR OPERATION.

16.2. CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE PROPER AND ACCURATE POSITION OF SOCKETS IN ALL FIXTURES SO THAT THE FILAMENT OF THE SIZE AND TYPE LAMPS SPECIFIED, WHEN INSTALLED IN SUCH SOCKETS, WILL BE IN CORRECT RELATION TO THE CENTER OF THE FIXTURE AS SPECIFIED BY THE MANUFACTURER OF THE VARIOUS LIGHTING FIXTURES AND GLASS UNITS SPECIFIED.

16.3. ALL SOCKETS SHALL BE APPROVED BY UNDERWRITERS' LABORATORIES, INC. FLUORESCENT SOCKETS SHALL BE THRU-SLOT TYPE AND INCANDESCENT LAMP SOCKETS SHALL BE 250 VOLT CODE STANDARD, MEDIUM BASE FOR LAMPS UP TO 200 WATTS INCLUSIVE AND MOGUL BASE FOR LAMPS 300 WATTS AND LARGER.

16.4. ALL FIXTURES SHALL BE WIRED FOR POLARIZED SYSTEM WITH ONE WIRE IN EACH FIXTURE TO BE DISTINCTLY MARKED FOR ITS ENTIRE LENGTH.

16.4.1. WIRE SHALL BEAR THE LABEL OF APPROVAL OF THE UNDERWRITERS LABORATORIES, INC.

16.4.2. FIXTURE WIRING FOR FLUORESCENT FIXTURES AND BRANCH CIRCUIT WIRING IN FLUORESCENT FIXTURE CHANNELS SHALL BE TYPE THHN OR THW (90 DEGREE C. RATED).

16.4.3. ALL CHANNELS IN FLUORESCENT LIGHTING FIXTURES SHALL BE APPROVED FOR THRU-WIRING.

16.4.4. TYPE AF WIRE SHALL ONLY BE USED FOR INTERIOR INCANDESCENT FIXTURE WIRING.

16.5. ALL FIXTURES SHALL BE IN ACCORDANCE WITH ALL LOCAL MUNICIPAL AND STATE REQUIREMENTS GOVERNING SAME AND SHALL BE U.L. APPROVED.

16.6. EACH FIXTURE SHALL BE COMPLETELY EQUIPPED WITH LAMPS OF THE SIZE, TYPE, WATTAGE AND SHAPE INDICATED AND SPECIFIED.

16.6.1. ALL LAMPS SHALL BE OF STANDARD SCHEDULE MAKE.

16.6.2. LUMEN OUTPUT AND LIFE OF LAMPS SHALL BE PROPER VOLTAGE FOR THE BUILDING.

16.6.3. EXACT VOLTAGE SHALL BE CHECKED BEFORE ORDERING FIXTURES.

16.7. ALL FLUORESCENT LIGHTING FIXTURES SHALL HAVE ENERGY SAVING, SOLID STATE ELECTRONIC BALLASTS.

16.8. AT THE LOCATION OF OUTLETS INDICATED ON THE VARIOUS DRAWINGS, THE TYPE OF FIXTURE REQUIRED IS DESIGNATED BY A TYPE LETTER. ALL FIXTURES SHALL BE FURNISHED IN THE QUANTITIES, SIZES AND TYPES AS INDICATED ON THE DRAWINGS.

16.9. HANDLE LIGHTING FIXTURES CAREFULLY TO PREVENT DAMAGE, BREAKING AND SCORING. DO NOT INSTALL DAMAGED FIXTURES OR COMPONENTS, REPLACE WITH NEW.

16.10. STORE LIGHTING FIXTURES IN A CLEAN DRY PLACE. PROTECT FROM WEATHER, DIRT, FUMES, WATER CONSTRUCTION DEBRIS AND PHYSICAL DAMAGE.

16.11. SHIP FIXTURES FACTORY ASSEMBLED, WITH PARTS REQUIRED FOR A COMPLETE INSTALLATION.

16.12. AT DATE OF SUBSTANTIAL COMPLETION REPLACE LAMPS IN ALL FIXTURES WHICH ARE OBSERVED TO BE INOPERATIVE OR NOTICEABLY DIMMED AFTER CONSTRUCTION USE AS JUDGED BY THE OWNER'S REPRESENTATIVE.

16.13. ALL LUMINAIRES UTILIZED FOR EMERGENCY AND/OR EGRESS LIGHTING SHALL BE CONNECTED AHEAD OF SWITCHING.

16.14. ALL BALLASTS OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND CATALOG.

16.15. ALL LAMPS OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND CATALOG NUMBER.

16.16. LED (LIGHT EMITTING DIODE) LIGHT FIXTURES

16.16.1. PROVIDE FACTORY INSTALLED LED MODULES THAT ARE SPECIFICALLY DESIGNED FOR, AND MATCHED AND MATED TO, THE RESPECTIVE LUMINAIRE IN WHICH THEY ARE USED.

16.16.1.1. PROVIDE LED MODULES THAT CAN EASILY BE REPLACED IN THE FIELD AND ARE READILY ACCESSIBLE FOR REPLACEMENT.

16.16.1.2. PROVIDE COLOR TEMPERATURE AS INDICATED IN LUMINAIRE SCHEDULE.

16.16.2. PROVIDE FACTORY INSTALLED DRIVER(S) FOR THE LED SOURCE UTILIZED THAT ARE SPECIFICALLY COORDINATED TO THE LED SOURCE AND LUMINAIRE IN WHICH THEY ARE USED.

16.16.2.1. PROVIDE DRIVER(S) HAVING SPECIFIC OPERATING CHARACTERISTICS DEFINED IN THE LUMINAIRE SCHEDULE.

16.16.2.2. PROVIDE DRIVER(S) THAT CAN EASILY BE REPLACED IN THE FIELD AND ARE READILY ACCESSIBLE FOR REPLACEMENT.

16.16.2.3. PROVIDE SPECIFICATION SHEET FOR THE SPECIFIC DRIVER AS PART OF THE LUMINAIRE SUBMITTAL.

16.16.3. PROVIDE TOTAL HARMONIC DISTORTION (THD) RATING OF LESS THAN 20 PERCENT.

16.16.3.1. PROVIDE FACTORY-INSTALLED INTEGRAL FILTERING SYSTEM TO ENSURE THD DOES NOT EXCEED 20 PERCENT REGARDLESS OF QUANTITIES AND/OR MIXES WITH OTHER MANUFACTURED LED SYSTEMS

16.17. FLUORESCENT LIGHT FIXTURES

16.17.1. FLUORESCENT BALLAST SHALL BE CLASS P, LOW-ENERGY RAPID START SOUND RATED A.

16.17.2. PROVIDE LAMPS IN WATTAGES AND TYPES INDICATED.

16.18. INCANDESCENT LIGHT FIXTURES

16.18.1. PROVIDE INCANDESCENT LAMPS IN THE SIZES AND RATED AS INDICATED AND 120 VOLT RATED.

16.19. MOUNTING

16.19.1. ALL SURFACE AND RECESSED CEILING LUM1NAIRES INSTALLED ON GRID OR TILE CEILINGS SHALL BE INSTALLED TO AGREE WITH MODULE OF CEILING EITHER DISPLACING A TILE, OR UNIT ON CENTER OF TILE, OR CENTERED ON GRID LINES.

16.19.2. RECESSED INCANDESCENT AND FLUORESCENT FIXTURES IN CEILINGS MAY NOT BE SUPPORTED FROM THE SUSPENDED CEILING CONSTRUCTION. BOX AND FIXTURE SUPPORTS SHALL BE FASTENED SECURELY TO CONCRETE SLAB OR BAR JOIST EXCEPT AS NOTED. WHERE FIXTURES ARE SURFACE MOUNTED, NEAT HOLES SHALL BE CUT IN THE HUNG CEILINGS AS REQUIRED FOR THE FIXTURE SUPPORTS. ALL SUPPORT HANGERS, CHANNELS, BOLTS, ETC., SHALL BE GALVANIZED OR GALV-KROM.

16.19.3. PROVIDE ADEQUATE SUPPORTS FOR ALL FIXTURES SEPARATE FROM THE SUSPENDED CEILING SYSTEM. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY ACCESSORIES, AS REQUIRED, TO SUPPORT THE FIXTURES. PROVIDE A MINIMUM OF TWO (2) GALVANIZED STEEL #12 GAUGE HANGER WIRES (ALTERNATE CORNERS) ON ALL RECESSED FIXTURES.PROVIDE LUMINAIRES AND/OR LUMINAIRE OUTLET BOXES WITH HANGERS TO PROPERLY SUPPORT LUMINAIRE WEIGHT. ALL LUMINAIRES INSTALLED IN OR ON SUSPENDED CEILING SYSTEMS SHALL BE ANCHORED DIRECTLY TO THE BUILDING STRUCTURAL SYSTEM ABOVE. SUCH ANCHORING SHALL BE INDEPENDENT OF THE CEILING SUPPORT SYSTEM.

16.19.4. ALL LUMINAIRES SHALL BE INSTALLED PLUMB AND SUPPORT SURFACE MOUNTED LUMINAIRES GREATER THAN 2 FEET IN LENGTH AT A POINT IN ADDITION TO THE OUTLET BOX LUMINAIRE STUD.

16.19.5. INSTALL FLUSH MOUNTED FIXTURES TO ELIMINATE LIGHT LEAKAGE BETWEEN FRAME AND FINISHED SURFACE.

16.19.6. ALL RECESSED LUMINAIRES SHALL BE EQUIPPED WITH NECESSARY PLASTER FRAMES AND SURFACE TRIM.

16.19.7. ALL JUNCTION BOXES AND SERVICEABLE COMPONENTS FOR RECESSED LUMINAIRES SHALL BE READILY ACCESSIBLE FOR SERVICE OR REPLACEMENT FROM BELOW THE CEILING, WITHOUT REMOVING ANY CEILING COMPONENTS (OTHER THAN TILES).

16.19.8. STEM LENGTHS OF ALL PENDANT FIXTURES SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.

16.19.9. ALL FASTENERS, HANGERS AND METHOD OF HANGING EXPOSED WORK IN FINISHED AREAS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR REVIEW BEFORE INSTALLATION.

16.19.10. FASTENERS SHALL BE ZINC-COATED, TYPE, GRADE, AND CLASS AS REQUIRED FOR A NEAT FINISHED INSTALLATION.

16.20. LIGHTING CONTROL DEVICES

16.20.1. OCCUPANCY SENSORS, DUAL TECHNOLOGY WALL SWITCHES:

16.20.1.1. PROVIDE WATTSTOPPER DW-100 WALL SWITCH (OR EQUIVALENT) AND CONFIGURE AS MANUAL ON, AUTO OFF (VACANCY SENSOR) UNLESS OTHERWISE SPECIFIED ON DRAWINGS. PROVIDE WITH TIME DELAY AS SPECIFIED ON DRAWINGS, IF NO TIME DELAY IS SPECIFIED, PROGRAM TO 10 MINUTES.

16.20.2. OCCUPANCY SENSORS, DUAL TECHNOLOGY CEILING SENSORS:

16.20.3. PROVIDE WATTSTOPPER DT-300 CE ILING MOUNTED OCCUPANCY SENSOR (OR EQUIVALENT). PROVIDE WITH TIME DELAY AS SPECIFIED ON DRAWINGS. IF NO TIME DELAY IS SPECIFIED, PROGRAM TO 20 MINUTES. ADJUST SENSITIVITY BASED ON FIELD CONDITIONS AND OCCUPANCY OF ROOM TO PROVIDE 100% COVERAGE WITHOUT NUISANCE TRIPPING.

16.20.4. PROVIDE WATTSTOPPER BZ-150 UNIVERSAL VOLTAGE PACK(S} AS REQUIRED TO PROPERLY POWER ALL OCCUPANCY SENSORS AND PROVIDE SWITCHING PER THE DESIGN INTENT.

16.20.5. IN AREAS WHERE MULTIPLE OCCUPANCY SENSORS CONTROL A SINGLE ZONE TOGETHER, INTERLOCK OCCUPANCY SENSORS/POWER PACKS PER MANUFACTURER INSTRUCTIONS TO MEET CONTROL INTENT.

16.21. OCCUPANCY ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING AIMABLE LUMINAIRES TO SUIT ACTUAL OCCUPIED CONDITIONS. PROVIDE UP TO TWO VISITS TO PROJECT DURING OTHER-THAN-NORMAL OCCUPANCY HOURS FOR THIS PURPOSE. SOME OF THIS WORK MAY BE REQUIRED AFTER DARK. ADJUST AIMABLE LUMINAIRES IN THE PRESENCE OF OWNER'S REPRESENTATIVE AND DESIGN PROFESSIONALS.

NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

E403
ELECTRICAL SPECIFICATIONS

CHECKED: NYE DRAWN: NYE

PLUMBING SPECIFICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. GENERAL PROVISIONS SPECIFICALLY APPLICABLE TO DIVISION 15 SECTIONS, IN ADDITION TO DIVISION 1 — GENERAL REQUIREMENTS.

1.2 SCOPE

A. THE WORK SHALL INCLUDE THE PROVISIONS OF SYSTEMS, EQUIPMENT AND MATERIALS SPECIFIED IN THIS DIVISION AND AS CALLED FOR ON THE DRAWINGS. WORK SHALL ALSO INCLUDE SUPERVISION, OPERATION, METHODS AND LABOR FOR THE FABRICATION, START—UP AND TESTS FOR A COMPLETE OPERATIONAL PLUMBING INSTALLATION.

B. DRAWINGS FOR THE WORK ARE DIAGRAMMATIC IN NATURE AND ME INTENDED 11) CONVEY THE SCOPE OF THE INSTALLATION AND TO INDICATE THE GENERAL ARRANGEMENT MD LOCATIONS OF THE WORK. BECAUSE OF THE SCALE OF THE DRAWINGS, CERTAIN BASIC ITEMS SUCH AS PIPE FITI1NGS, ACCESS PANELS, AND SLEEVES MAY NOT BE SHOWN. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR SELECTING THE EQUIPMENT TO FIT THE SPACE PROVIDED. THE LOCATION AND SIZES FOR PIPE FITTINGS, SLEEVES, INSERTS, FIRE AND/OR SMOKE DAMPERS, AND OTHER BASIC ITEMS REQUIRED BY CODE AND OTHER SECTIONS SHALL BE COORDINATED AND INCLUDED FOR THE PROPER INSTALLATION OF THE WORK.

C. EQUIPMENT SPECIFICATIONS MAY NOT DEAL INDIVIDUALLY WITH MINUTE ITEMS REQUIRED SUCH AS COMPONENTS, PARTS, CONTROLS AND DEVICES WHICH MAY BE REQUIRED TO PRODUCE THE EQUIPMENT PERFORMANCE SPECIFIED OR AS REQUIRED TO MEET THE EQUIPMENT WARRANTIES. WHERE SUCH ITEMS ARE REQUIRED, THEY SHALL BE INCLUDED BY THE INSTALLER OF THE EQUIPMENT, WHETHER OR NOT SPECIFICALLY INDICATED IN THE CONTRACT DOCUMENTS WITH NO ADDITIONAL COST INCURRED.

D. WHERE NOTED ON THE DRAWINGS OR INDICATED IN OTHER SECTIONS OF THE SPECIFICATION, THE CONTRACTOR FOR THIS DIVISION SHALL INSTALL PLUMBING EQUIPMENT FURNISHED BY OTHERS, AND SHALL MAKE ALL FINAL CONNECTIONS. CONTRACTOR SHALL INSTALL EQUIPMENT AND SYSTEMS IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

E. COORDINATE WITH ALL TRADES IN SUBMITTAL OF SHOP DRAWINGS. TIGHT SPACE CONDITIONS SHALL BE DETAILED TO THE SATISFACTION OF ALL TRADES, SUBJECT TO THE REVIEW AND FINAL ACCEPTANCE OF THE ARCHITECT/ENGINEER. IN THE EVENT THAT THE CONTRACTOR INSTALLS HIS WORK BEFORE COORDINATING WITH OTHER TRADES OR SO AS TO CAUSE ANY INTERFERENCE WITH THE WORK OF THE OTHER TRADES THIS CONTRACTOR SHALL MAKE ALL REQUIRED CHANGES TO CORRECT THE CONDITION AT NO ADDITIONAL COST TO THE PROJECT.

F. CONTRACTOR SHALL VERIFY ALL EQUIPMENT CONNECTION SIZES PRIOR TO INSTALLATION OF ANY SYSTEMS. THIS CONTRACTOR SHALL ADJUST PIPING SYSTEM SIZES AS REQUIRED TO MATCH EQUIPMENT CONNECTIONS. UTILIZE REDUCERS WHERE EQUIPMENT CONNECTIONS ME SMALLER THAN PIPE SIZES INDICATED ON PLANS, NO PIPING SHALL BE DECREASED IN SIZE (IN THE DIREC110N OF FLOW).

G. EXAMINATION OF BIDDING DOCUMENTS:

1. EACH BIDDER SHALL EXAMINE THE BIDDING DOCUMENTS CAREFULLY AND NOT LATER THAN TEN (10) DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS, SHALL MAKE WRITTEN REQUEST TO THE ENGINEER FOR INTERPRETATION OR CORRECTION OF ANY AMBIGUITY, INCONSISTENCY OR ERROR THEREIN. ANY INTERPRETATION OR CORRECTION MIL BE ISSUED AS AN ADDENDUM BY THE ENGINEER. ONLY A WRITTEN INTERPRETATION OR CORRECTION TO BID DOCUMENTS BY ADDENDUM SIMI BE BINDING. NO BIDDER SHALL RELY UPON ANY INTERPRETATION OR CORRECTION GIVEN BY ANY OTHER METHOD.

H. SUBSTITUTIONS:

1. EXCEPT AS PROVIDED BELOW, EACH BIDDER REPRESENTS THAT HIS BID IS BASED UPON THE MATERIALS MD EQUIPMENT DESCRIBED IN THE BIDDING DOCUMENTS.
2. NO SUBSTITUTIONS FOR OTHER MATERIALS AND EQUIPMENT WILL BE CONSIDERED UNLESS WRITTEN REQUEST HAS BEEN SUBMITTED TO THE ENGINEER FOR APPROVAL AT LEAST TEN (10) DAYS PRIOR TO THE DATE FOR RECEIPT OF BIDS. EACH SUCH REQUEST SHALL INCLUDE A COMPLETE DESCRIP11ON OF THE PROPOSED SUBSTITUTE, THE NAME OF THE MATERIAL OR EQUIPMENT FOR WHICH IT IS TO BE SUBSTITUTED, DRAWINGS, CUTS, PERFORMANCE AND TEST DATA OR INFORMATION NECESSARY FOR A COMPLETE EVALUATION.
3. IF THE ENGINEER APPROVES MY PROPOSED SUBSTITUTION, SUCH APPROVAL WILL BE ISSUED AS AN ADDENDUM FORWARDED TO ALL PARTICIPATING BIDDERS.
4. IF ANY BIDDER IS UNABLE TO PROCURE WRITTEN APPROVAL OF MY SUBSTITUTION FROM THE ENGINEER PRIOR TO THE OPENING OF BIDS, THEN HE SHALL BASE HIS BID ON ITEMS AND SYSTEMS AS SPECIFIED IN BID DOCUMENTS.
5. SUBSTITUTIONS REQUESTED ON THE BID PROPOSAL FORM WHICH ME PRIOR APPROVED BY THE ENGINEER WILL BE INCORPORATED INTO THE CONTRACT WITH THE SUCCESSFUL BIDDER.
6. REQUESTS FOR MY SUBSTITUTIONS NOT SUBMITTED MD APPROVED IN ACCORDANCE WITH THE ABOVE INSTRUCTIONS WILL BE DENIED BY THE ENGINEER.

1.3 REGULATORY REQUIREMENTS

A. ALL INSTALLATIONS AND EQUIPMENT SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE STATUTES, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION.

1. CONFIRM TO 2018 UNIFORM PLUMBING CODE WITH AMENDMENTS.

1.4 CUTTING AND PATCHING

A. SUBMIT WRITTEN REQUEST IN ADVANCE OF CUTTING OR ALTERING ELEMENTS.
B. EMPLOY SKILLED AND EXPERIENCED INSTALLER TO PERFORM CUTTING AND PATCHING WHICH EFFECT:

1. INTEGRITY OF WATER PROOFING MATERIALS.
2. EFFICIENCY, MAINTENANCE, OR SAFETY OF ELEMENTS.
3. VISUAL QUALITIES OF SIGHT.
4. WORK OF OWNER OR SEPARATE CONTRACTOR

C. NO STRUCTURAL ELEMENTS TO BE CUT WITH OUT PRIOR APPROVAL OF THE ARCHITECT.

PART 2 PRODUCTS

2.1 PIPE HANGERS AND SUPPORTS

A. MANUFACTURERS:
1. B—LINE
2. OTHER ACCEPTABLE MANUFACTURERS OFFERING EQUIVALENT PRODUCTS.
a. MICHIGAN HANGER.
b. PHD.

2.2 HOT WATER WATER PIPING INSULATION
A. MANUFACTURERS:

1. OWENS—CORNING
2. JOHNS—MANVILLE
3. KNAUF

B. ASTM C547, RIGID MOLDED NON—COMBUSTIBLE FIBERGLASS INSULATION. 'K' VALUE .024 @ 75 DEGREES F.

C. VAPOR BARRIER JACKET, KRAFT PAPER WITH GLASS FIBER YARN AND BONDED TO ALUMINUM FILM. CLOSURE SYSTEM SHALL BE UL 181.

D. INSULATION THICKNESS 1—1/2.

2.3 SANITARY AND GREASE SEWER AND VENT PIPING

A. PVC: ASTM D2665 SCHEDULE 40 PVC PIPING.
1. FITTINGS: AS1M D2665 SCHEDULE 40 PVC DYN FITTINGS.
2. JOINTS: ASTM D2564 SOLVENT CEMENT. JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2855.
3. 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.

2.4 WATER PIPING

A. COPPER PIPING: ASTM B88 TYPE 'L' HARD DRAWN OR CPVC.

1. FITTINGS: ASME B16.18 CAST BRONZE OR ASME B16.22 WROUGHT COPPER OR BRONZE.

2. JOINTS: ASTM B32 SOLDER, ASTM 95—5 TA MINIMUM, FLUX AS1M 8813. JOINTS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM B828.

3. 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.

PART 3 INSTALLATION

A. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

B. PROVIDE NON—CONDUCTING DIELECTRIC CONNECTIONS WHEREVER JOINTING DISSIMILAR METALS.

C. ROUTE PIPING IN ORDERLY MANNER AND MAINTAIN GRADIENT.

D. INSTALL PIPING TO CONSERVE BUILDING SPACE AND NOT INTERFERE WITH USE OF SPACE.

E. GROUP PIPING WHENEVER PRACTICAL AT COMMON ELEVATIONS.

F. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT.

G. PROVIDE CLEARANCE FOR INSTALLATION OF INSULATION AND ACCESS TO VALVES AND FITTINGS.

H. PROVIDE ACCESS WHERE VALVES AND FITTINGS ME NOT EXPOSED. COORDINATE SIZE AND LOCATION OF ACCESS DOORS WITH APPROPRIATE ARCHITECTURAL SECTION

I. ESTABLISH ELEVATIONS OF PIPING INSIDE AND OUTSIDE THE BUILDING TO ENSURE PROPER SLOPE AND CONNECTION.

J. WHERE PIPE SUPPORT MEMBERS ARE WELDED TO STRUCTURAL BUILDING FRAMING, SCRAPE, BRUSH CLEAN, AND APPLY ONE COAT OF ZINC RICH PRIMER TO WELDING.

K. EXTEND CLEANOUTS TO FINISHED FLOOR OR WALL SURFACE, LUBRICATE THREADED CLEANOUT PLUGS WITH MIXTURE OF GRAPHITE AND LINSEED OIL. ENSURE CLEARANCE AT CLEANOUT FOR RODDING OF DRAINAGE SYSTEM.

L. INSTALL WATER HAMMER SHOCK ARRESTORS AT EACH FIXTURE OR BATTERY OF FIXTURES WHERE REQUIRED. ARRESTORS SHALL BE FACTORY FABRICATED. INSTALL ARRESTORS AND SIZE PER PLUMBING AND DRAINAGE INSTITUTE STANDARD P.D.I. WH—201. ACCEPTABLE MANUFACTURERS ZURN, JOSAM, SIOUX CHIEF. PPP INC. FOR 1—11 FU'S PROVIDE PDI—A, FOR 12—32 FU'S PDI—B, 33—60 FU'S PDI—C, 61—113 FU'S PDI —D.

FIELD VERIFY ALL CONDITIONS

NOTE!

AS NOTED IN THE SPECIFICATIONS, All WIRING LAYOUTS, PIPING LAYOUTS AND DUCT LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONSTRUCTION AND STRUCTURE OF THE BUILDING AND SHALL BE VERIFIED AND COORDINATED IN THE FIELD. EACH TRADE CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THAT HE HAS THOROUGHLY REVIEWED AND COORDINATED ALL LOCATIONS AND ROUTINGS WITH ALL OTHER TRADES PRIOR TO FABRICATION OF CONDUITS, DUCTS, OR PIPING, AND START OF INSTALLATION OF SAME (INCLUDING SPRINKLER PIPING WHEN PRESENT ON JOB). ANY INSTALLATION OR CONSTRUCTION CONFLICTS WHICH OCCUR IN THE FIELD SHALL BE RESOLVED BY THE TRADE CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ARCHITECT AND AT NO EXPENSE TO THE OWNER, ARCHITECT AND/OR GENERAL CONTRACTOR.

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 ME 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 THOR 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.

GENERAL NOTES

1. ALL WORK SHALL BE IN STRICT ACCORDANCE WITH THE FOLLOWING CODES:

1 2018 INTERNATIONAL BUILDING CODE
2018 INTERNATIONAL FIRE CODE
2018 UNIFORM MECHANICAL CODE
2018 UNIFORM PLUMBING CODE WITH AMENDMENTS
2017 NATIONAL ELECTRICAL CODE
1 2021 INTERNATIONAL ENERGY CONSERVATION CODE

2. CONTRACTOR SHALL GIVE 72 HOUR NOTICE IN WRITING TO, AND RECEIVE WRITTEN APPROVAL FROM THE BUILDING ADMINISTRATOR (OR HIS REPRESENTATIVE) PRIOR TO SHUT DOWN OF ANY SYSTEM OR DISRUPTION OF SERVICE TO ANY AREA. CONTRACTOR SHALL ALSO COORDINATE THE MT LOCATION AND TIMING OF SYSTEM(S) SHUTDOWN POINTS WITH THE OWNER REPRESENTATIVE (IE; ENGINEERING DEPARTMENT) CONTRACTOR SHALL MAKE EVERY EFFORT POSSIBLE TO MINIMIZE THE DURATION OF ANY DOWNTIME OR DISRUPTION PERIOD.

3. THE CONTRACTOR IS EXPECTED TO ORDER ALL MATERIALS IN SUFFICIENT TIME TO AVOID DELAYING THE COMPLETION OF THE PROJECT. DELAY IN DELIVERIES WILL NOT BE CONSIDERED A JUSTIFIABLE REASON FOR SUBMISSION OF SUBSTITUTE MATERIALS.

4. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF PLUMBING FIXTURE MOUNTING HEIGHTS, MD DIMENSIONS.

5. REFER TO ARCH PLANS FOR ALL ORE RATED FLOOR AND WALL PENETRATION DETAILS.

6. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES.

7. ALL PIPING PENETRATING A BEARING WALL OR STRUCTURAL MEMBER MUST BE SLEEVED AND LOCATION APPROVED BY STRUCTURAL ENGINEER.

8. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY FIRINGS AS REQUIRED BY ALL APPLICABLE CODES AND GOVERNING AUTHORITIES.

9. CONTRACTOR SHALL VERIFY AND CORRECT AS REQUIRED TO MEET ALL CODES AND REGULATIONS ANY POSSIBLE DISCREPANCIES BETWEEN TYPE AND SIZE OF CONNECTION SPECIFIED IN PLUMBING FIXTURE SCHEDULE AND FIX1URES ACTUALLY INSTALLED ON THE SITE.

10. VALVES AND FITTINGS SHALL BE OF SAME SIZE OF LINE ON WHICH THEY ARE LOCATED, UNLESS OTHERWISE INDICATED ON DRAWINGS.

11. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING FIRE RATING AND WEATHERPROOFING INTEGRITY OF ALL PIPING AND PENETRATIONS. ALL PENETRATION FOR ALL PIPING THRU FLOOR SLAB SHALL BE WATERPROOFED.

12. ALL WATER SUPPLY, SANITARY MD STORM PIPING SHALL BE RUN AS CLOSE TO PLANS AS POSSIBLE WITH NO CHANGES IN SIZING.

13. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY SUPPORTING DEVICES FOR ALL FIXTURES INCLUDED IN CONTRACT OR HEREIN SPECIFIED OR OTHERWISE.

14. ROUTE ALL PIPING CONCEALED ABOVE CEILINGS, WITHIN WALLS, OR IN CHASES. PIPING EXPOSED SHALL BE SLOPED AND PAINTED TO MATCH ARCHITECTURAL FINISHES. PIPING IN MECHANICAL ROOMS MAY BE EXPOSED.

15. CONTRACTOR SHALL INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALS.

16. CONTRACTOR SHALL ROUGH—IN ALL WASTES AND SUPPLIES TO SPECIAL EQUIPMENT ACCORDING TO MANUFACTURER'S SHOP DRAWINGS MD MAKE FINAL CONNECTIONS. ALL SUPPLIES SHALL BE VALVED. INSTALL VACUUM BREAKERS WHERE REQUIRED BY CODE.

17. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS (INCLUDING PIPE ROUTING AND EQUIPMENT LOCATIONS) TO ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE INSTALLATION OR PURCHASING OF ANY PIPING AND/OR EQUIPMENT.

18. CONTRACTOR SHALL FIELD VERIFY ALL GIVEN MEASUREMENTS PRIOR TO LAYING AND CONNECTING ALL SANITARY AND WASTE PIPING AND NOTIFY ARCHITECT OF ANY DISCREPANCIES.

19. ALL SANITARY PIPING OVER 3" IN DIAMETER SHALL HAVE A 1/8" PER FOOT AND ALL SANITARY PIPING 3" OR LESS IN DIAMETER SHALL HAVE A 1/4" PER FOOT SLOPE UNLESS OTHERWISE NOTED.

20. ALL DRAINAGE PIPING SHALL BE MARKED WITH THE SEAL OF APPROVAL OF THE NATIONAL SANITATION FOUNDATION.

21. ALL FLOOR DRAINS SHALL BE PROVIDED WITH TRAP PRIMER VALVE AND FITTINGS UNLESS NOTED OTHERWISE.

22. CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF SEWERS TO WHICH NEW SEWER LINES ARE TO BE CONNECTED BEFORE COMMENCING ANY WORK.

23. PROVIDE ACCESS PANELS TO ALL VALVES WITHIN CHASES OR MOVE NON—ACCESSIBLE CEILINGS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.

24. PROVIDE REDUCED PRESSURE BACKFLOW PREVENTERS FOR DOMESTIC WATER SUPPLIES AS REQUIRED BY LOCAL WATER PURVEYORS.

25. PRESSURE REDUCING VALVES SHALL BE INSTALLED ON BRANCH LINES AND/OR MAINS SERVING FIXTURES AND/OR EQUIPMENT, WHEN THE PRESSURE IN THE LINE EXCEEDS 80 P.S.I. A VELOCITY BETWEEN 5 AND 8 FEET PER SECOND SHALL BE MAINTAINED.

26. SUPPORT AND PAINT PER LL STANDARD DETAILS. TWO COATS OF RUST PREVENTATIVE PAINT — COLOR AS SELECTED BY LANDLORD.

27. ROOF SUPPORTS TO BE DBRIO—12 AS MANUFACTURED BY COOPER B—LINE OR EQUAL— PRESSURE TREATED WOOD BLOCKING IS NOT ALLOWED.

28. PIPING TO BE SUPPORTED EVERY 10' OR AS REQUIRED BY LOCAL CODE.

ALL EQUIPMENT AND PIPING SHOWN ON THESE PLANS ARE A BASES OF DESIGN. EQUIVALENT OR EQUAL IS APPROVED. VERFIY ANY CHANGES WITH OWNER AND ENGINEER

FOOD SERVICE NOTES

1. ALL SERVICE LINES FOR WATER SHALL BE SIZED TO PROVIDE FULL FLOW VOLUME FOR ALL ITEMS SUPPLIED ON RESPECTIVE MAINS AND BRANCHES. IDENTIFY ALL LINES WITH PERMANENT LABELS FOR THE SERVICE THEY PROVIDE.

2. PLUMBING CONTRACTOR SHALL COORDINATE WITH KITCHEN CONSULTANT DRAWINGS FOR ROUGH IN LOCATIONS, SIZES AND HOOK—UP REQUIREMENTS FOR ALL KITCHEN EQUIPMENT. ROUGH IN EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

3. ALL HOT AND COLD WATER SERVICE LINES, EXCEPT SHORT BRANCHES EXTENDED AND CONNECTED TO FIXTURES, SHALL BE INSULATED. ALL EXPOSED INSULATED LINES SHALL BE COVERED WITH PROTECTIVE COVERING TO SUIT THE APPLICATION.

4. ALL HORIZONTAL PIPING LINES EXTENDED AND CONNECTED 113 EQUIPMENT, BELOW EQUIPMENT, SHALL BE RUN AT THE HIGHEST POSSIBLE ELEVATION ABOVE FLOOR, TO PROVIDE CLEARANCE FOR CLEANING. NO LINES SHALL LAY ON FLOOR.

5. ALL PIPING ROUTED THROUGH OR NEAR EQUIPMENT OR COUNTERS SHALL NOT INTERFERE WITH THE INTENDED USE OF OR SERVICING OF EQUIPMENT OR COUNTERS.

6. ALL EXPOSED PIPING AND FIRINGS SHALL BE CHROME PLATED OR STAINLESS STEEL TAIL PIECES FOR SINKS SHALL BE 17 GAUGE CHROME PLATED FLARED BRASS TUBING FOR CONNECTION TO 1—1/2" I.P.S. MALE THREAD FITTING. 'P' TRAPS SHALL BE CHROME PLATED BRASS, UNIFORM CODE PATTERN.

7. STOPS SHALL BE FURNISHED AND INSTALLED ON ALL HOT AND COLD WATER LINES AT EQUIPMENT. PROVIDE AII REQUIRED SHUT—OFF VALVES, CHROME FINISH.

8. EQUIPMENT SINKS ARE PROVIDED WITH 1—1/2" WASTE CONNECTIONS.

9. ALL WASTES, DIRECT OR INDIRECT, SHALL BE FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR EXCEPT AS NOTES ON UTILITY PLANS. MINIMUM SIZE INDIRECT WASTES SHALL BE 1" REGARDLESS OF SIZE OF CONNECTION AT EQUIPMENT.

10. PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL DRAIN LINES FROM COOLER AND FREEZER TO DRAIN LOCATIONS WITH 1/4712' MINIMAL PITCH AND 'PS/ TRAP IN END OVER FLOOR RECEPTOR DRAIN LINES SHALL BE 1" MINIMUM. EACH UNIT SHALL HAVE A SEPARATE DRAIN LINE.

11. WATER SERVICES FOR PORTABLE AND COUNTER TOP APPLIANCES SHALL BE CONNECTED TO EQUIPMENT WITH STAINLESS STEEL FLEXIBLE HOSES AND QUICK DISCONNECT FIRINGS. WATER HOSES SHALL BE COVERED WITH A THICK FIRE RESISTANT PLASTIC OR POLY COATING.

ABBREVIATIONS

CODP	CLEANOUT DECK PLATE
FCO	FLOOR CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
S	SOIL
ST	STORM
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST.	EXISTING
FD	FLOOR DRAIN
SQ. FT.	SQUARE FEET
BFP	BACK FLOW PREVENTER
WH	WATER HEATER
EWC	ELECTRIC WATER COOLER
WCO	WALL CLEANOUT

GENERAL LEGENDS

- ISOLATION VALVE
- PIPE UP
- PIPE DOWN
- BALANCING VALVE
- CHECK VALVE, HORIZONTAL SWING
- CAPPED LINE
- SAN — SANITARY SEWER (ABOVE GRADE)
- SAN — SANITARY SEWER (BELOW GRADE)
- DOMESTIC COLD WATER
- CWF — COLD FILTERED WATER
- SHOCK ABSORBER
- DOMESTIC HOT WATER
- DOMESTIC HOT WATER RETURN
- VENT
- G — GAS LINE (BELOW GRADE)
- G — GAS LINE (ABOVE GRADE)
- POINT OF CONNECTION NEW TO EXISTING
- HB — HOSE BIBB
- FLOOR DRAIN
- FLOOR CLEANOUT
- CLEANOUT

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE TYPE	DESCRIPTION	FIXTURE CONNECTIONS C.W.	H.W.	W.	V.	MANUFACTURER MODEL NUMBER
FD—1	FLOOR DRAIN	TYPE N STRAINER. PROVIDE WITH COMPLETE BODY ASSEMBLY WITH TRAP PRIMER CONNECTION	—	—	3"	2"	ZURN: (MODEL #Z—415)
FS—1	FLOOR SINK	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	—	—	3"	2"	J.R. SMITH: (3000 SERIES)
TMV—1	THERMOSTATIC MIXING VALVE	THERMOSTATIC MIXING VALVE BELOW FIXTURE. SET AT TEMP. 110 F (ASSE 1070)	—	—	—	—	POWERS: (LFE480)
RP—1	RECIRC. PUMP	0.120HP, 115V/1PH, 2GPM @ 15FT. HEAD	—	—	—	—	BELL & GOSSETT : MODEL NBF—18S
CODP—1	FLOOR CLEANOUT	SIZE PER PIPING LATERAL, 4" MAX.	—	—	—	—	ZURN: MODEL #1454
WH—1	WATER HEATER	GAS TANK WATER HEATER 75.1MBH GAS INPUT, 75 GALLONS & RECOVERY 91 GPH @80 DEG. F TEMP. RAISE	—	—	—	—	AO SMITH : BL—80
LAV—1	ADA LAVATORY	ITEM: SOHO K—2084—0 WALL—MOUNT SINK W/SINGLE CENTER FAUCET HOLE FINISH: WHITE NOTE: PROVIDE ADA PIPE COVER, PA8(SEE PLUMBING ACCESSORIES)	1/2"	1/2"	2"	1—1/2"	KOHLER K2084—0 RESPONSIBILITY : CSCI
WC—1	ADA TOILET	ITEM: HIGHLINE K—3519 FLOOR MOUNT PRESSURE ASSIST FINISH: WHITE NOTE: INCLUDE K—4650 TOILET SET, VERIFY WITH LOCAL CODES.	3/4"	—	4"	2"	KOHLER K3519 RESPONSIBILITY : CSCI
ET—1	EXPANSION TANK	FOR LOCATION REFER FLOOR PLANS	—	—	—	—	AMTROL : ST—5C—DD

NY ENGINEERS
NEARBY ENGINEERS, 382 NE 191ST
STREET SUITE 49674, MIAMI,
FL 33179 PH- 786.788.0295

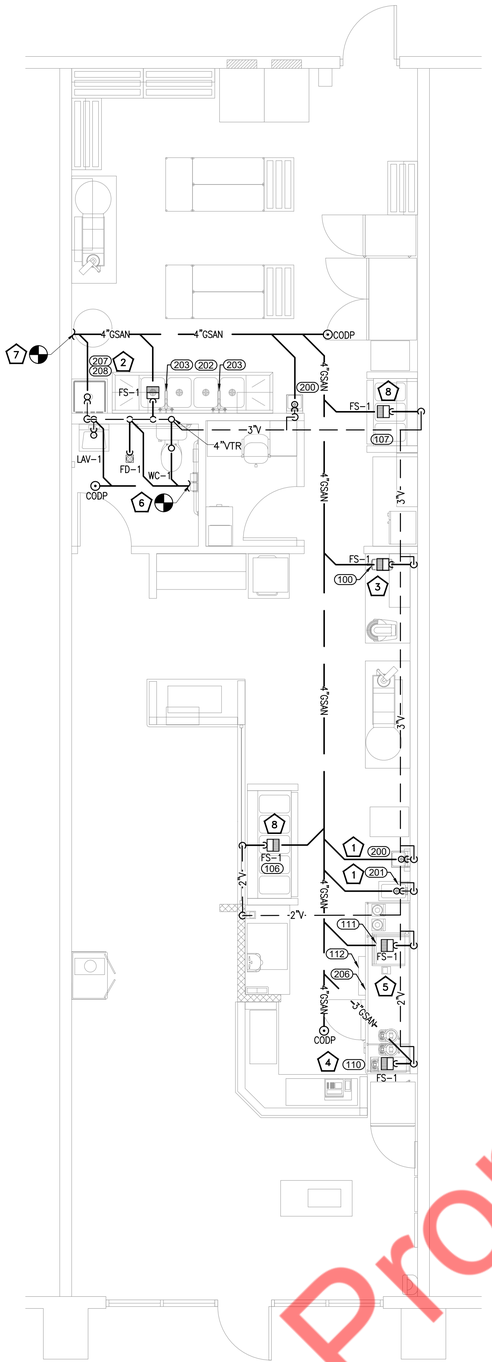
1 3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

P001
PLUMBING SCHEDULE NOTES & SPECIFICATION

CHECKED: NYE DRAWN: NYE



1 **UNDERGROUND PLUMBING PLAN**
1/4"=1'-0"

KEYED NOTES:

1. ROUTE DIRECT WASTE FROM HAND SINK TO GREASE WASTE LINE.
2. SPILL WATER HEATER INDIRECT WASTE TO NEAREST MOP SINK WITH APPROVED AIR GAP.
3. ROUTE INDIRECT WASTE FROM WATER DISPENSER TO FLOOR SINK WITH APPROVED AIR GAP.
4. ROUTE INDIRECT WASTE FROM COFFEE MACHINE TO FLOOR SINK WITH APPROVED AIR GAP.
5. ROUTE INDIRECT WASTE FROM ICE MAKING MACHINE AND ESPRESSO MACHINE TO FLOOR SINK WITH APPROVED AIR GAP.
6. CONNECT NEW 4" SANITARY LINE TO THE EXISTING SANITARY LINE. CONTRACTOR TO FIELD VERIFY EXISTING SANITARY PIPE SIZE, ROUTING AND INVERT PRIOR TO BID, RE-ROUTE NEW SANITARY LINE AS PER SITE CONDITION IF REQUIRED. BASE BID ACCORDINGLY.
7. CONNECT NEW 4" GREASE WASTE LINE TO THE EXISTING 2500 GALLON GREASE INTERCEPTOR. CONTRACTOR TO FIELD VERIFY EXISTING GREASE WASTE PIPE SIZE, ROUTING AND INVERT PRIOR TO BID, RE-ROUTE NEW GREASE WASTE LINE AS PER SITE CONDITION IF REQUIRED. BASE BID ACCORDINGLY.
8. ROUTE INDIRECT WASTE FROM STEAM TABLE TO FLOOR SINK WITH APPROVED AIR GAP.

FIXTURE / EQUIPMENT SCHEDULE

ITEM #	DECSRIPTION	MANUFACTURER	MODEL	REMARK
202	SS SINK 4-BASIN WITH (2) 18" DRAINBOARDS	EAGLE GROUP	414-16-4-18	-
203	POT SINK FAUCET (FOR 4-COMP SINK)	WATERLOO	750FW812	8" CENTERS & 12" SWING SPOUT
200	HAND SINK W/ 2 SPLASH GUARDS INCLUDES FAUCET	REGENCY	600HS12SP	INSTALL MIXING VALVE
201	UNDERBAR HAND SINK W/ SWIVEL FAUCET	REGENCY	600B110014	INSTALL MIXING VALVE
207	MOP SINK	ZURN	Z1996-24	G.C. TO SUPPLY & INSTALL
112	ICE MAKER - UNDERCOUNTER	MANITOWOC	UY-0140A	REQUIRES 3/8" FILTERED WATER CONNECTION
110	SINGLE COFFEE BREWER	BUNN	ICB-DV,TALL,53100.0101	REQUIRES ADDITIONAL 120V RECEPTACLE & 3/8" FCW
111	ESPRESSO MACHINE	NUOVO SIMONELLI	APPIA LIFE COMPACT 220V	REQUIRES 3/8" FILTERED WATER CONNECTION
100	WATER DISP. w/ DISPLAY	BUNN	H5X ELEMENT 43600.0002	REQUIRED 1/4" FILTERED WATER CONNECTION

GREASE INTERCEPTOR SIZING CALCULATION

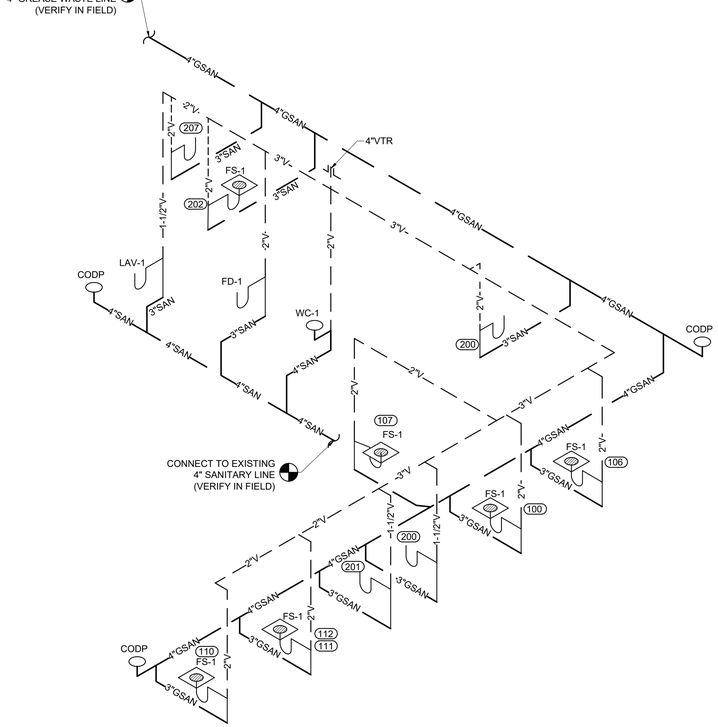
ITEM NO.	FIXTURE	QUANTITY	GREASE	
			DFU PER FIXTURE	TOTAL DFU
202	4 COMP SINK	1	6	6
200	HAND SINK	2	1	2
201	HAND SINK	1	1	1
207	MOP SINK	1	3	3
FS-1	FLOOR SINK	5	6	30
	TOTAL:			42

REQUIRED GRAVITY GREASE INTERCEPTOR CAPACITY AS PER UPC 2018, TABLE 1014.3.6 = 1250 GALLONS.

EXISTING GRAVITY GREASE INTERCEPTOR CAPACITY = 2500 GALLONS.

PLUMBING DRAINAGE FIXTURE UNIT SCHEDULE

SYMBOL	DESCRIPTION	QTY.	DFU	TOTAL DFU
WC-1	WATER CLOSET	1	4	4
LAV-1	LAVATORY	1	1	1
202	SS SINK 4-BASIN WITH (2) 18" DRAINBOARDS	1	6	6
200	HAND SINK W/ 2 SPLASH GUARDS INCLUDES FAUCET	2	1	2
201	UNDERBAR HAND SINK W/ SWIVEL FAUCET	1	1	1
207	MOP SINK	1	3	3
106	5 WELL STEAM TABLE (DRAIN TO FLOOR SINK.)	1	6	6
107	3 WELL STEAM TABLE (DRAIN TO FLOOR SINK.)	1	6	6
110	SINGLE COFFEE BREWER (DRAIN TO FLOOR SINK.)	1	6	6
111 112	ESPRESSO MACHINE ICE MAKER - UNDERCOUNTER (DRAIN TO FLOOR SINK)	1	6	6
100	WATER DISP. w/ DISPLAY	1	6	6
FD-1	FLOOR DRAIN	1	6	6
TOTAL DFU=				53



2 **WASTE AND VENT RISER**
NTS

NY ENGINEERS
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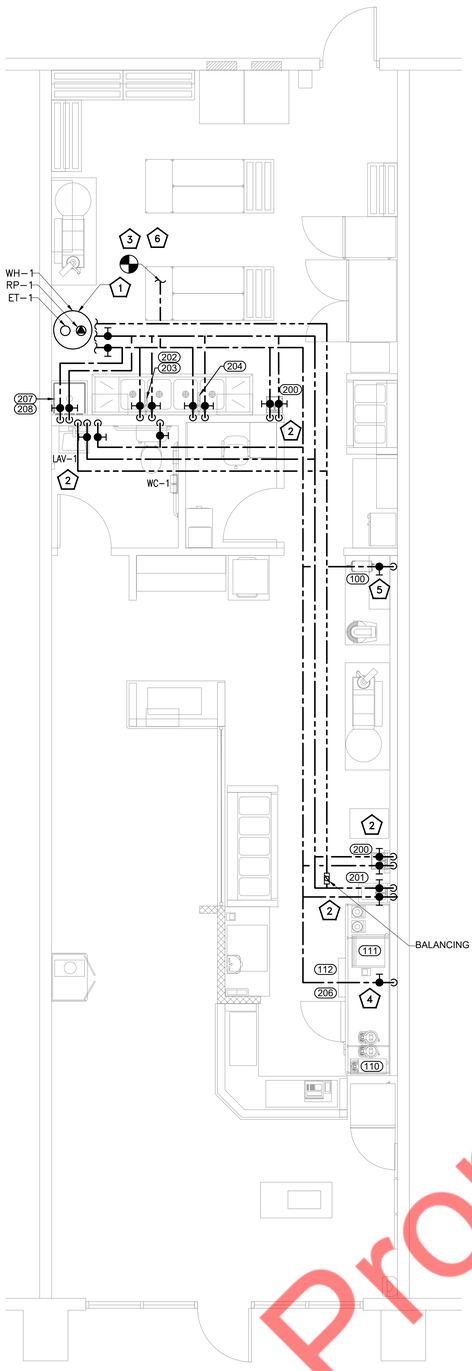
3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

P101
PLUMBING UNDERGROUND PLAN

CHECKED: NYE DRAWN: NYE



1 **ABOVEGROUND PLUMBING PLAN**
1/4"=1'-0"

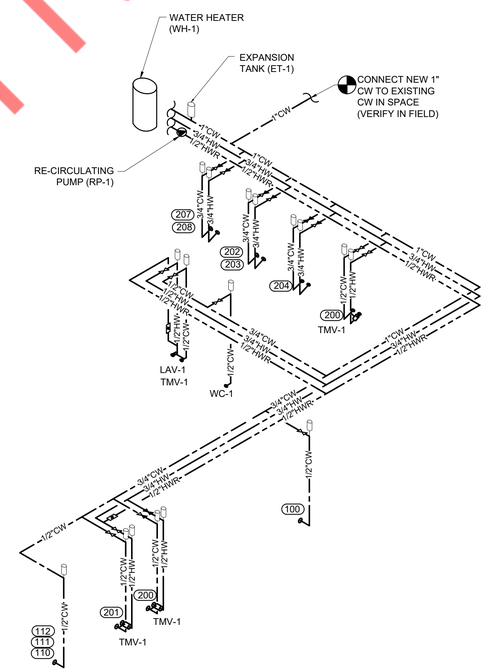
PLUMBING WATER SUPPLY FIXTURE UNIT SCHEDULE

SYMBOL	DESCRIPTION	QTY.	WSFU					
			CW EACH	TOTAL (CW)	HW EACH	TOTAL (HW)	TOTAL EACH	TOTAL EACH
WC-1	WATER CLOSET	1	3	3	–	–	3	3
LAV-1	LAVATORY	1	1	1	1	1	1	1
202	SS SINK 4-BASIN WITH (2) 18" DRAINBOARDS	2	2	4	2	4	3	6
200	HAND SINK W/ 2 SPLASH GUARDS INCLUDES FAUCET	2	1	2	1	2	1	2
201	UNDERBAR HAND SINK W/ SWIVEL FAUCET	1	1	1	1	1	1	1
207	MOP SINK	1	2	2	2	2	3	3
112	ICE MAKER – UNDERCOUNTER	1	0.5	0.5	–	–	0.5	0.5
110	SINGLE COFFEE BREWER	1	0.5	0.5	–	–	0.5	0.5
111	ESPRESSO MACHINE	1	0.5	0.5	–	–	0.5	0.5
100	WATER DISP. w/ DISPLAY	1	0.5	0.5	–	–	0.5	0.5
						TOTAL WSFU =		18
						SERVICE TOTAL GPM =		14
						SERVICE SIZE =		1"

DENOTES EQUIPMENT. SEE ARCHITECTURAL SHEET A501 FOR ADDITIONAL INFORMATION AND SUPPLIER RESPONSIBILITIES.

WATER HEATER SIZE CALCULATION

SYMBOL	DESCRIPTION	QTY.	GPH/FIX.	TOTAL GPH
LAV-1	LAVATORY	1	8	8
202	SS SINK 4-BASIN WITH (2) 18" DRAINBOARDS	1	50	50
200	HAND SINK W/ 2 SPLASH GUARDS INCLUDES FAUCET	2	8	16
201	UNDERBAR HAND SINK W/ SWIVEL FAUCET	1	8	8
207	MOP SINK	1	30	30
	TOTAL GPH			112
	DEMAND FACTOR			0.75
	TOTAL PROBABLE DEMAND			84 GPH
	STORAGE FACTOR			1
	VOLUME REQ.			84 GAL.



2 **DOMESTIC WATER RISER**
NTS

PLUMBING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	C.W.	H.W.	F.W.	MAXIMUM WATER CONSUMPTION
WC-1	WATER CLOSET	1/2"	–	–	1.28 GALLON PER FLUSH
LAV-1	LAVATORY	1/2"	1/2"	–	0.5 GALLON AT 60 PSI
202	SS SINK 4-BASIN WITH (2) 18" DRAINBOARDS	3/4"	3/4"	–	1.5 GALLON PER MINTUE
200	HAND SINK W/ 2 SPLASH GUARDS INCLUDES FAUCET	1/2"	1/2"	–	0.5 GALLON AT 60 PSI
201	UNDERBAR HAND SINK W/ SWIVEL FAUCET	1/2"	1/2"	–	0.5 GALLON AT 60 PSI
207	MOP SINK	3/4"	3/4"	–	1.5 GALLON PER MINTUE
112	ICE MAKER – UNDERCOUNTER	–	–	1/2"	0.5 GALLON AT 60 PSI
110	SINGLE COFFEE BREWER	–	–	1/2"	0.5 GALLON AT 60 PSI
111	ESPRESSO MACHINE	–	–	1/2"	0.5 GALLON AT 60 PSI
100	WATER DISP. w/ DISPLAY	–	–	1/2"	0.5 GALLON AT 60 PSI

NOTES
1. PROVIDE SHUT OFF VALVES FOR ALL WATER LINES AT PLUMBING FIXTURES AND EQUIPMENT CONNECTIONS.
2. MAXIMUM FLOW FROM A SINK FAUCET SHALL NOT EXCEED 2.2 GAL. OF WATER/MIN & LAV. FAUCET SHALL NOT EXCEED 0.5 GAL. OF WATER/MIN AT 60PSI PRESSURE.
7. REFER TO ARCHITECTURAL SHEET FOR ADDITIONAL PLUMBING FIXTURES.

WATER SUPPLY KEYED NOTES:

1. PROVIDE STORAGE TYPE GAS FIRED WATER HEATER (WH-1) WITH THERMAL EXPANSION TANK (ET-1) & RECIRCULATION PUMP (RP-1) HOT WATER RETURN PIPING, ASSOCIATED ACCESSORIES AND FITTINGS.
2. PROVIDE (ASSE1070) THERMOSTATIC MIXING VALVE AT ALL HAND SINK AND LAVATORIES IF NOT ALREADY PROVIDED WITH THEM. SET AT 110°F MAXIMUM.
3. CONNECT NEW CW LINE TO EXISTING COLD WATER SERVICE CONTRACTOR TO FIELD VERIFY EXISTING CW PIPE SIZE, LOCATION, BACK FLOW PREVENTOR AND SUBWATER METER LOCATION, WORKING CONDITION, UPGRADE IF REQUIRED COORDINATING WITH OWNER. BASE BID ACCORDINGLY.
4. EXTEND ½" CW TO WATER FILTER (SIMILAR TO AQUA-POOR MODEL AP200):
   EXTEND:
   ½" FW TO (110)
   ½" FW TO (111)
   ½" FW TO (112)
   SEE RISER DIAGRAM FOR MORE DETAILS. COORDINATE WITH ARCHITECTURAL DWG'S FOR MORE DETAILS
5. EXTEND ½" CW TO WATER FILTER (SIMILAR TO AQUA-POOR MODEL AP200):
   EXTEND:
   ½" FW TO (100)
   SEE RISER DIAGRAM FOR MORE DETAILS. COORDINATE WITH ARCHITECTURAL DWG'S FOR MORE DETAILS
6. CONTRACTOR TO FIELD VERIFY INCOMING WATER PRESSURE IS GREATER THAN 60 PSI. NOTIFY ENGINEER IF PRESSURE IS LESS THAN 60 PSI PRIOR TO START OF THE WORK. ADD ALTERNATE OPTION IN BID TO PROVIDE WATER BOOSTER PUMP IF PRESSURE IS LESS THAN 60 PSI

FIXTURE / EQUIPMENT SCHEDULE

ITEM #	DECSRIPTION	MANUFACTURER	MODEL	REMARK
202	SS SINK 4-BASIN WITH (2) 18" DRAINBOARDS	EAGLE GROUP	414-16-4-18	–
203	POT SINK FAUCET (FOR 4-COMP SINK)	WATERLOO	750FW812	8" CENTERS & 12" SWING SPOUT
200	HAND SINK W/ 2 SPLASH GUARDS INCLUDES FAUCET	REGENCY	600HS12SP	INSTALL MIXING VALVE
201	UNDERBAR HAND SINK W/ SWIVEL FAUCET	REGENCY	600B110014	INSTALL MIXING VALVE
207	MOP SINK	ZURN	Z1996-24	G.C. TO SUPPLY & INSTALL
112	ICE MAKER – UNDERCOUNTER	MANITOWOC	UY-0140A	REQUIRES 3/8" FILTERED WATER CONNECTION
110	SINGLE COFFEE BREWER	BUNN	ICB-DV,TALL,53100.0101	REQUIRES ADDITIONAL 120V RECEPTACLE & 3/8" FCW
111	ESPRESSO MACHINE	NUOVO SIMONELLI	APPIA LIFE COMPACT 220V	REQUIRES 3/8" FILTERED WATER CONNECTION
100	WATER DISP. w/ DISPLAY	BUNN	H5X ELEMENT 43600.0002	REQUIRED 1/4" FILTERED WATER CONNECTION

BACKFLOW DEVICE SCHEDULE

TAG	SERIES	SIZE	TYPE	USAGE	APPROVAL
BFP-1	9D	1/2"	BACKFLOW PREVENTER W/ ATMOSPHERIC VENT	COFFEE MACHINE, WATER DISPENSER, ESPRESSO MACHINE	ASSE 1012
BFP-2	007QTS	1/2"	DUAL CHECK VALVE	ICE MAKER	ASSE 1015
BFP-3	N9-CD	3/4"	DUAL CHECK VACCUM BREAKER	HOSE BIB	ASSE 1052

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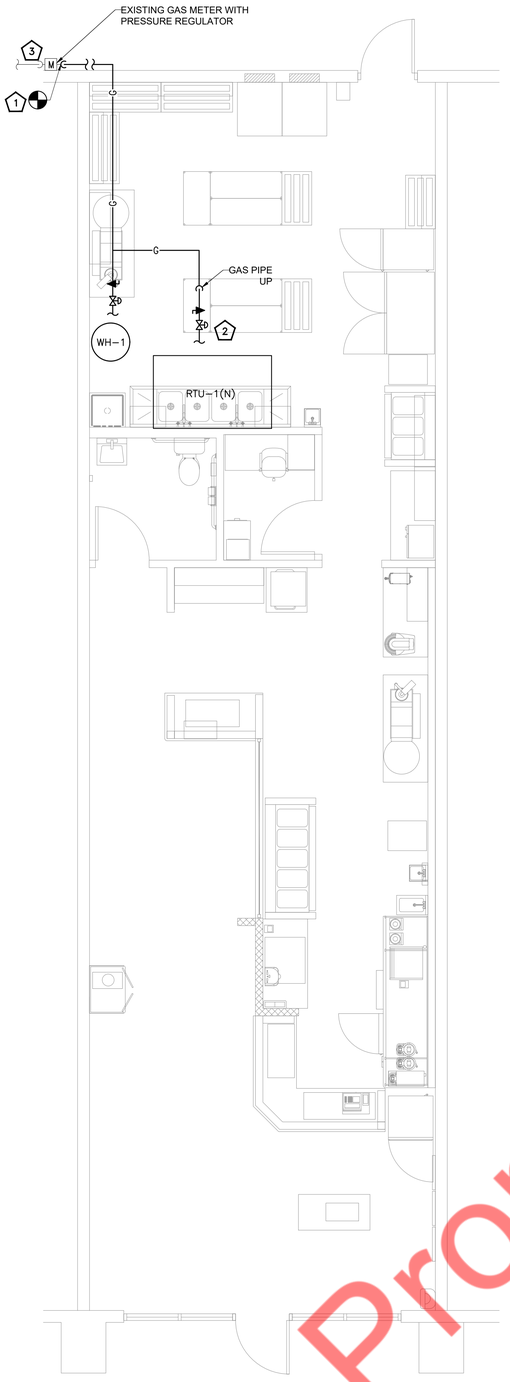
3/31/2025 BUILDING COMMENTS
NO DATE REMARKS
REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

P102
PLUMBING ABOVE GROUND PLAN

CHECKED: NYE DRAWN: NYE



1 **PLUMBING GAS SUPPLY PIPING PLAN**
1/4"=1'-0"

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 UPC 2018 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 SCREWED 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 UPC 2018, SECTION 1215.2 PIPE SIZING, TABLE 1215.2(1).
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. CONTRACTOR TO COORDINATE WITH GAS UTILITY COMPANY AND PROVIDE MINIMUM REQUIRED GAS PRESSURE TO ALL EQUIPMENTS.
7. PROVIDE PRV IF REQUIRED FOR ALL EQUIPMENTS TO MAINTAIN PRESSURE BELOW MAXIMUM LIMIT.

GAS PLAN KEY NOTES:

1. CONNECT NEW 1" GAS PIPING TO EXISTING GAS PIPE IN SPACE. CONTRACTOR TO FIELD VERIFY EXISTING GAS PIPE LOACTION, SIZE & PRESSURE, UPGRADE IF REQUIRED.
2. EXTEND GAS LINE TO RTU-1. PROVIDE GAS SHUTOFF VALVE, PRESSURE REGULATOR, UNION AND DRIP LEG.
3. CONTRACTOR TO VERIFY EXACT LOCATION, PRESSURE AND SIZE OF GAS SERVICE WITH UTILITY COMPANY AND UPGRADE EXISTING GAS SERVICE IF REQUIRED. SET THE MAXIMUM PRESSURE AS 14" W.C. AT GAS PRESSURE REGULATOR.

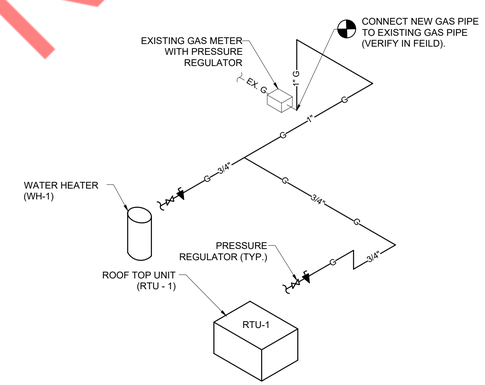
NATURAL GAS SCHEDULE

MARK	FIXTURE/EQUIPMENT	QTY	UNIT DEMAND BUTH	TOTAL CFH
WH-1	WATER HEATER	1	75,100	75.1
RTU-1	ROOF TOP UNIT	1	114,000	114

1" GAS LINE REQUIRED BASED ON 60'-0" TOTAL LENGTH OF PIPE AT LESS THAN 2 PSI.
GAS LOAD BASED ON UPC 2018, SECTION 1215.2 PIPE SIZING, TABLE 1215.2(1) SCHEDULE 40 METALLIC PIPE.

SIZE	GAS LOAD (CFH)
1/2"	65
3/4"	137
1"	257
1-1/4"	528
1-1/2"	791

NOTE:
CONTRACTOR TO FIELD VERIFY TOTAL LENGTH OF GAS PIPE AND NOTIFY ENGINEER IF DESIGN CONDITIONS DIFFER.



2 **GAS SUPPLY RISER**
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NO	DATE	REMARKS
1	3/31/2025	BUILDING COMMENTS

REVISIONS

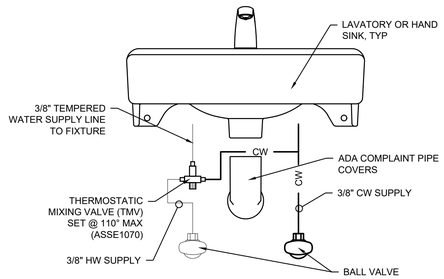
DUCK DONUTS

PROJECT NO: 2023.0204
DATE: 03.25.2025

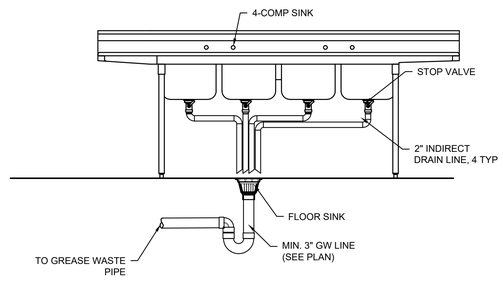
P103

PLUMBING GAS PIPING PLAN

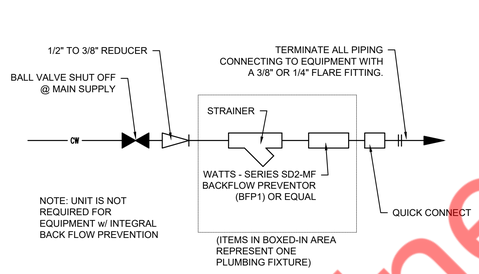
CHECKED: NYE DRAWN: NYE



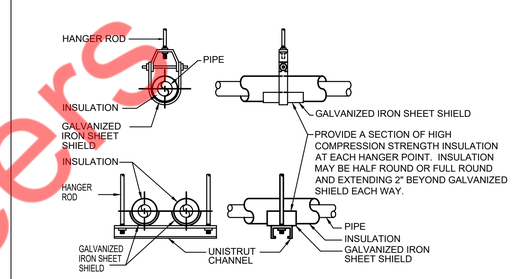
1 HAND SINK / LAVATORY DETAIL
Scale: NONE



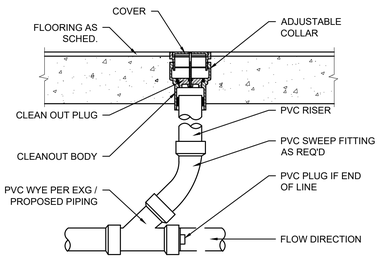
2 4-COMPARTMENT SINK DETAIL
Scale: NONE



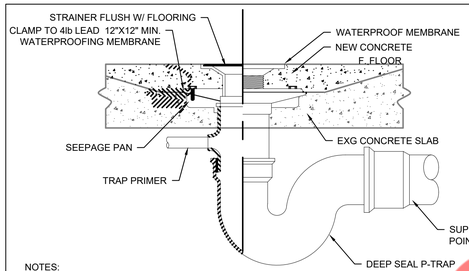
3 BACK FLOW PREVENTOR DETAIL
Scale: NONE



4 PIPE HANGER DETAIL
Scale: NONE



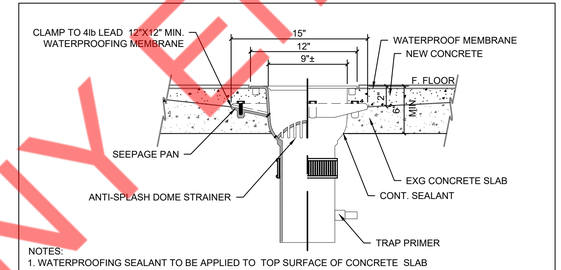
5 FLOOR CLEAN OUT DETAIL
Scale: NONE



NOTES:
1. WATERPROOFING SEALANT TO BE APPLIED TO TOP SURFACE OF CONCRETE SLAB
2. FLOOR DRAIN TO INCLUDE DEEP SEAL "P" TRAP
3. ALL PIPE PENETRATIONS ARE TO BE CAULKED WITH AN ELASTOMERIC WATERPROOF SEALANT.
4. G.C. TO VERIFY DIMENSIONS PRIOR TO INSTALLATION
5. INSTALL DRAIN STABILIZER IF REQUIRED
6. NOTIFY ARCHITECT IF SLAB THICKNESS IS 6" OR LESS.

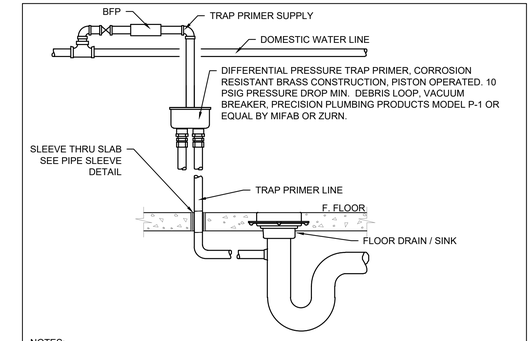
SLAB PENETRATION IS COMPLIANT WITH 2014 NYCBC 713.3.1 EXCEPTION 1

6 FLOOR DRAIN DETAIL
Scale: NONE



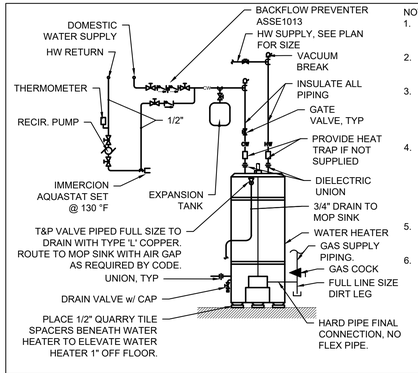
NOTES:
1. WATERPROOFING SEALANT TO BE APPLIED TO TOP SURFACE OF CONCRETE SLAB
2. FLOOR SINK TO INCLUDE DEEP SEAL "P" TRAP (NOT SHOWN)
3. ALL PIPE PENETRATIONS ARE TO BE CAULKED WITH AN ELASTOMERIC WATERPROOF SEALANT.
4. G.C. TO VERIFY DIMENSIONS PRIOR TO INSTALLATION
5. INSTALL DRAIN STABILIZER IF REQUIRED
6. NOTIFY ARCHITECT IF SLAB THICKNESS IS 6" OR LESS.

7 FLOOR SINK DETAIL
Scale: NONE



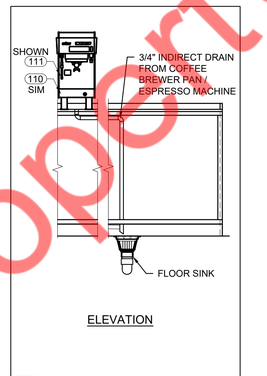
NOTES:
1. TRAP PRIMER TO BE LOCATED TO ALLOW ACCESS, PROVIDE ACCESS PANEL IF REQUIRED
2. P.C. TO USE TYPE 'K' COPPER W/ NO JOINTS FROM UNIT TO FLOOR DRAIN

8 TRAP PRIMER DETAIL
Scale: NONE



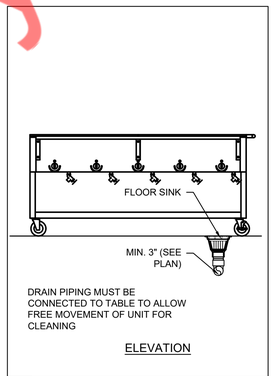
NOTE:
1. THE CIR. PUMP SHALL BE CONTROLLED BY THE TIME CLOCK AND THE IMMERSION AQUASTAT.
2. THE TIME CLOCK SHALL ONLY ALLOW THE PUMP TO OPERATE DURING OCCUPIED HOURS.
3. DURING OCCUPIED HOURS THE IMMERSION AQUASTAT SHALL START/STOP THE THE CIR PUMP BASED ON THE TEMPERATURE SET AT 110 DEG F.
4. POSITION VALVES AND TRIM IN SUCH THAT VALVES AND TRIM ARE UNOBSTRUCTED TO VIEW AND SO THAT ACCESS FOR OPERATION OR REPAIR IS POSSIBLE WITHOUT USE OF STEP LADDERS OR NEED TO DISASSEMBLE ANY COMPONENTS.
5. VENT HEATER UP THROUGH ROOF AS PER MANUFACTURER'S RECOMMENDATIONS.
6. HOLDRITE QUICK STRAP #QS-120 OR EQUIVALENT SEISMIC / EARTHQUAKE STRAP, ATTACHED TO WALL WITH BOLT, WASHER AND NUT.STRAPPING SHALL BE AT POINTS WITHIN THE UPPER ONE-THIRD AND LOWER ONE-THIRD OF ITS VERTICAL DIMENSIONS. AT THE LOWER POINT, A DISTANCE OF NOT LESS THAN 4 INCHES SHALL BE MAINTAINED FROM THE CONTROLS WITH THE STRAPPING.

9 TANK WATER HEATER DETAIL
Scale: NONE



ELEVATION

10 BACK COUNTER DETAIL
Scale: NONE



DRAIN PIPING MUST BE CONNECTED TO TABLE TO ALLOW FREE MOVEMENT OF UNIT FOR CLEANING

ELEVATION

11 STEAM TABLE DETAIL
Scale: NONE

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REVISIONS

DUCK DONUTS

PROJECT NO: 2023.0204
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P501
PLUMBING DETAILS

CHECKED: NYE DRAWN: NYE