

MECHANICAL SYMBOLS LIST

AC-1	TXF-1	EQUIPMENT SYMBOL
AIR DEVICES		
		CEILING DIFFUSER SUPPLY
		CEILING DIFFUSER RETURN

DUCT ACCESSORIES		
		BACKDRAFT DAMPER
		VOLUME DAMPER W/ ACCESS DODR

CONTROLS AND SENSORS		
		THERMOSTAT
		DUCT SMOKE DETECTOR

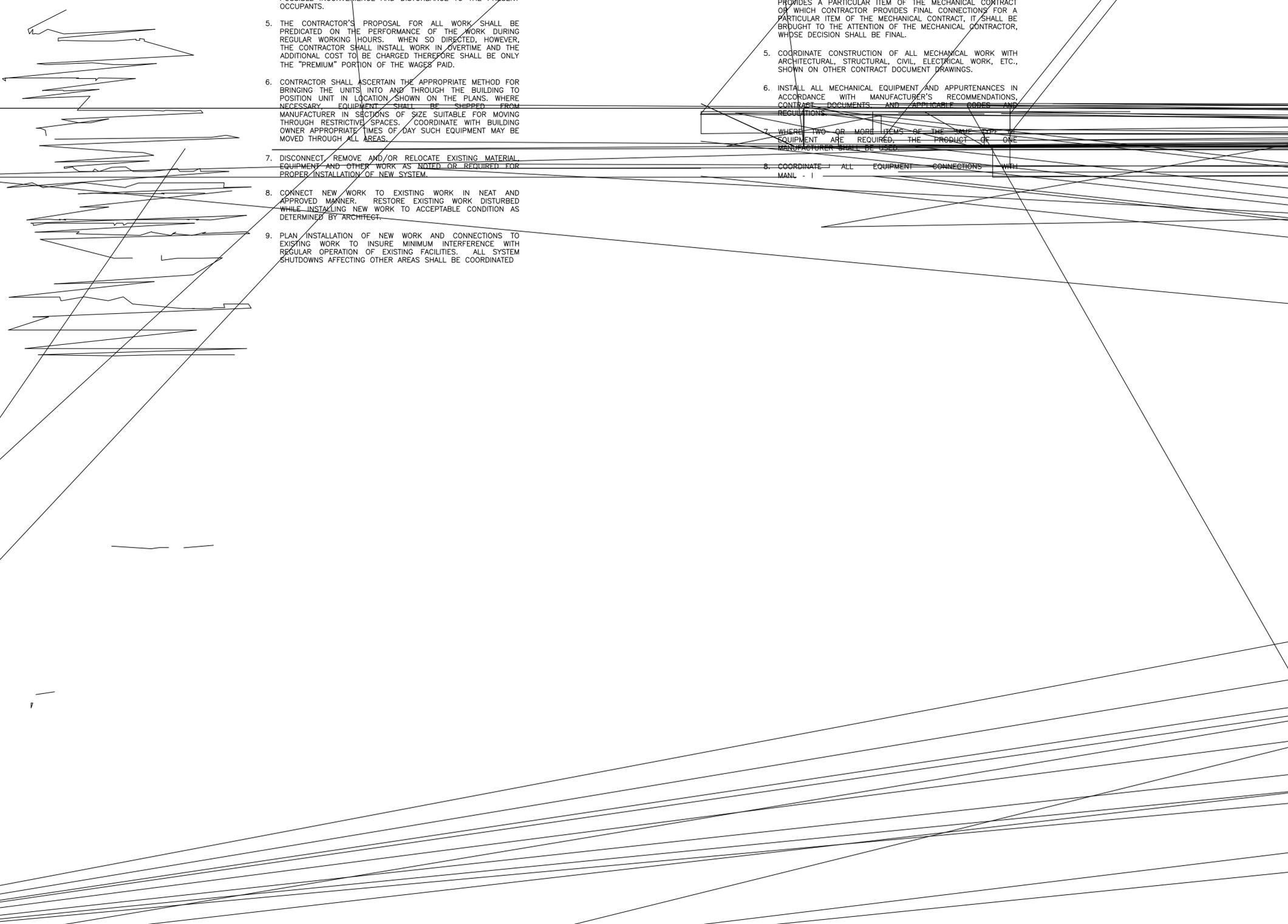
DUCTWORK		
		AIR DUCT W/ 1.5" ACOUSTICAL LINING
		FLEXIBLE DUCT
		FLEXIBLE CONNECTION
		RECTANGULAR DUCT (WIDTH X DEPTH)
		SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
		RETURN AIR RECTANGULAR DUCT CROSS SECTION

GENERAL NOTES

- CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
- ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
- THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
- CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
- PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED.

GENERAL:

- PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
- CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
- THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
- WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
- COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
- INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS AND APPLICABLE CODES AND REGULATIONS.
- WHERE TWO OR MORE ITEMS OF THE SAME TYPE OR EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
- COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANL - I



SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

1.1 SLEEVE-SEAL SYSTEMS

- A. FIELD-ASSEMBLED, MODULAR SEALING-ELEMENT UNIT FOR FILLING ANNULAR SPACE BETWEEN PIPING AND SLEEVE.
1. SEALING ELEMENTS: EPDM RUBBER OR NBR.
2. PRESSURE PLATES: CARBON STEEL, PLASTIC, STAINLESS STEEL.
3. CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION-RESISTANT COATING, STAINLESS STEEL.

- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1. ADVANCE PRODUCTS & SYSTEMS, INC.
2. CALPICO, INC.
3. METRAFLEX COMPANY (THE).
4. PIPELINE SEAL AND INSULATOR, INC.
5. PROCO PRODUCTS, INC.

1.2 SLEEVE-SEAL FITTINGS

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

1.3 GROUT

- A. NON-SHRINK, FACTORY PACKAGED.

1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE

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

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 2 - PRODUCTS

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

2.2 FLOOR PLATES

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

PART 3 - EXECUTION

- 3.1 INSTALLATION
A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.
B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.

- 1. ESCUTCHEONS FOR NEW PIPING:
a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
b. INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE.
c. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
d. BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.

3.2 FIELD QUALITY CONTROL

- A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS.

END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

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

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

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

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

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

1.4 COMPONENTS

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

END OF SECTION 230529

SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 COMPONENTS

- A. VIBRATION ISOLATORS:
1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE-DEFLECTION TYPE.
3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
4. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
5. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
6. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
8. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
9. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
10. PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
11. RESILIENT PIPE GUIDES.

B. AIR-MOUNTING SYSTEMS:

- 1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWES.
2. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWES.

- C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.

D. VIBRATION ISOLATION EQUIPMENT BASES:

- 1. STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
2. INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE

1.2 FIELD QUALITY CONTROL

- A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.

PART-2 PRODUCTS

1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES

- A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

- B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

- 1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. HILTI, INC.
5. ISOLATION TECHNOLOGY, INC.
6. KINETICS NOISE CONTROL.
7. LOOS & CO.; CABLEWARE DIVISION.
8. MASON INDUSTRIES.

- 9. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
10. UNISTRUT; TYCO INTERNATIONAL, LTD.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

1.2 QUALITY ASSURANCE

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

1.3 EXECUTION

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

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

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

1.2 FIELD QUALITY CONTROL

- A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:

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

1.4 ITEMS NOT INSULATED:

- 1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
3. FACTORY-INSULATED FLEXIBLE DUCTS.
4. FACTORY-INSULATED PLENUMS AND CASINGS.
5. FLEXIBLE CONNECTORS.
6. VIBRATION-CONTROL DEVICES.
7. FACTORY-INSULATED ACCESS PANELS AND DOORS.
8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.6 ACOUSTICAL TREATMENT

- 1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED.

END OF SECTION 230713

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION

- A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".
B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

- 1. CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH. USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK. USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
2. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY-COATED (GALVALUME) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METAL-LIC-COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.

- 3. USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5, WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3, WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31, USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.
4. WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.

- 5. PROVIDE EXPANDED TAKE-OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90-DEGREE TAKE-OFF FITTINGS OR TRAITG TAPS WILL NOT BE ACCEPTED.
6. BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.

- 7. ROUND DUCTS MAY BE SUBSTITUTED FOR RECTANGULAR DUCTS IF SIZED IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY WRITTEN PERMISSION OF THE ENGINEER.

END OF SECTION 233113

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

Table with 3 columns: USG, MAX. SIDE INCHES, TRANSVERSE JOINTS AND BRACING. Rows include specifications for 12 inch, 13 to 24 inch, and 20 to 35 inch ducts.

- D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:

- 1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

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

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

- A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
B. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
C. SHEET METAL MATERIALS:

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

D. DUCT LINER:

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

E. SEALANT MATERIALS:

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

1.3 DUCT CLEANING

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

B. CLEAN THE FOLLOWING ITEMS:

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

1.4 DUCT SCHEDULE

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

THERMOSTATIC CONTROL NOTES:-

A. C403.2.4.1 THERMOSTATIC CONTROLS.

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

EXCEPTION: INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED:
1. THE PERIMETER SYSTEM INCLUDES AT LEAST ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN +/-45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 MM); AND
2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.

B. C403.2.4.1.2 DEADBAND.

WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEADBAND OF AT LEAST 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM.

EXCEPTIONS:
1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
2. OCCUPANCIES OR APPLICATIONS REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.

C. C403.2.4.1.3 SET POINT OVERLAP RESTRICTION.

WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE PROVIDED WITH THE CAPABILITY TO PREVENT THE HEATING SET POINT FROM EXCEEDING THE COOLING SET POINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.2.4.1.2.

D. C403.2.4.2 OFF-HOUR CONTROLS.

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

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

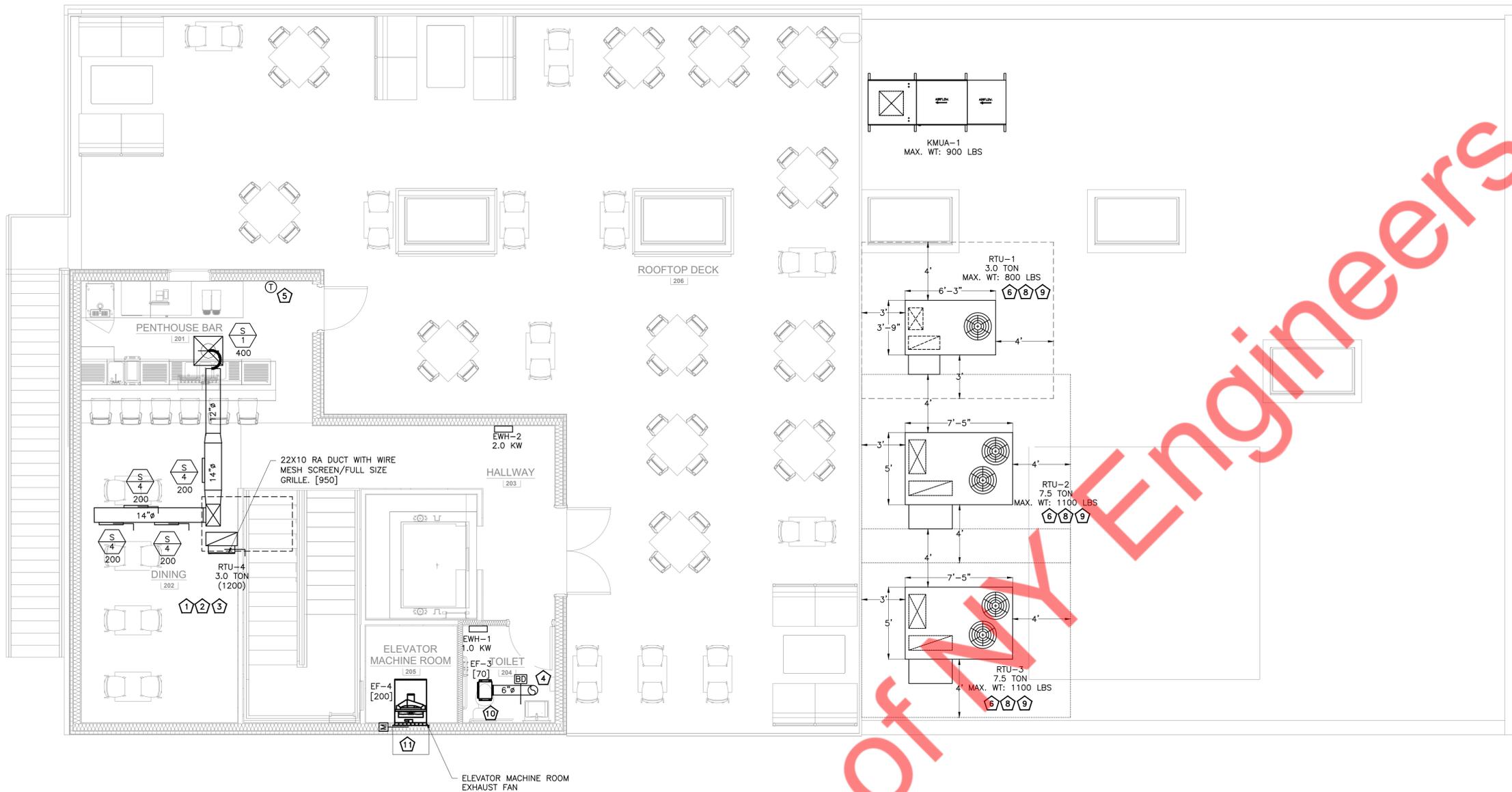
E. C403.2.4.2.1 THERMOSTATIC SETBACK CAPABILITIES.

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

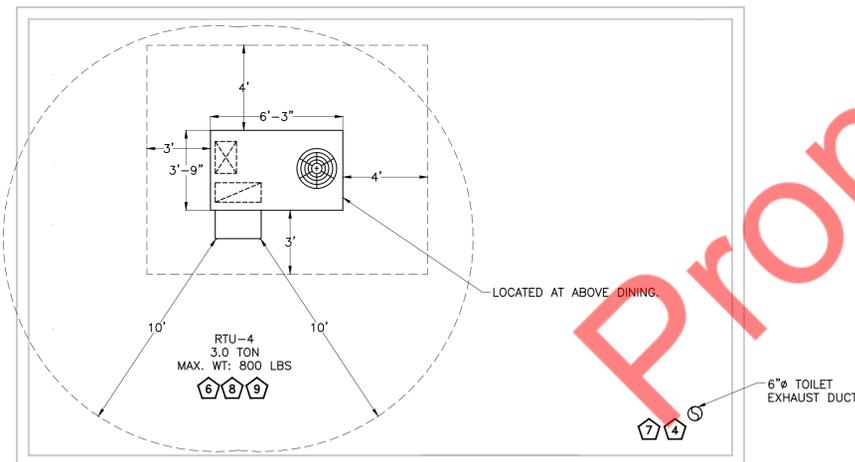
F. C403.2.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES.

AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

3



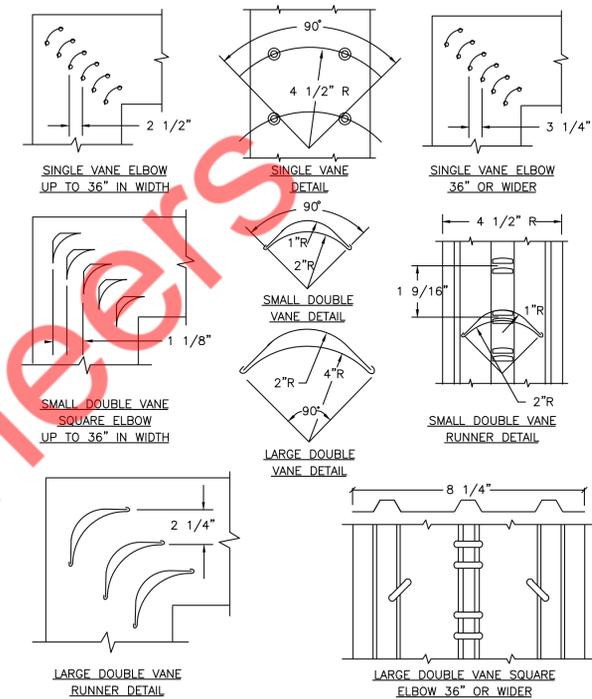
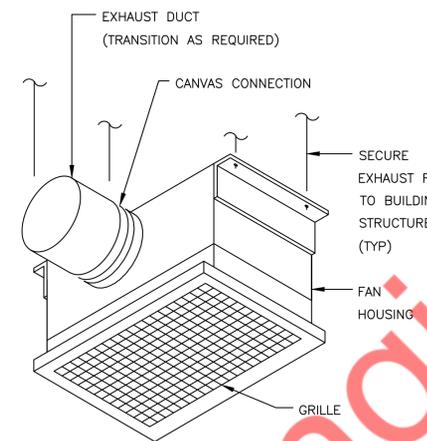
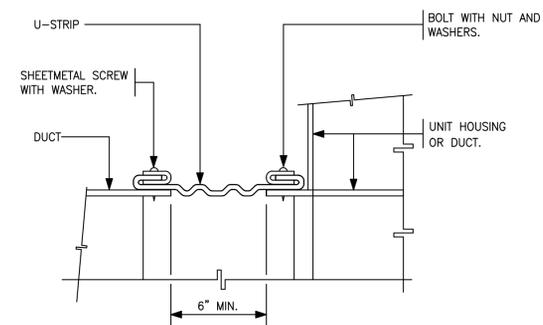
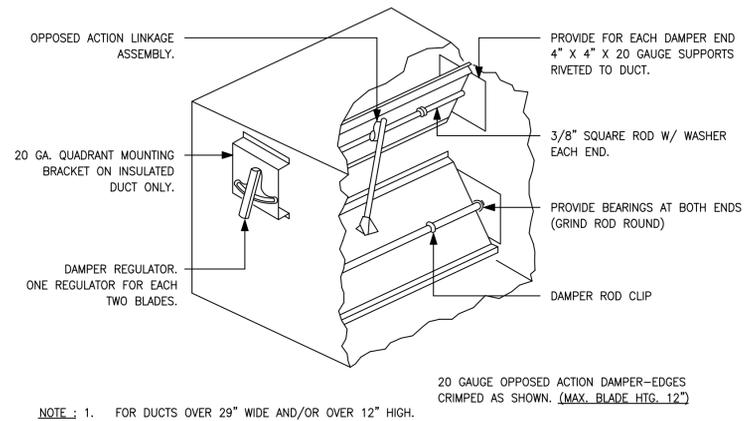
① MECHANICAL ROOF PLAN
1/4" = 1'-0"



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

- KEY NOTES**
- CONNECT AIR DISTRIBUTION DUCT TO AIR CONDITIONING UNITS AS NECESSARY.
 - ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
 - PROVIDE REMOTE TEMP SENSOR MOUNTED IN RETURN DUCT AND WIRE BACK TO T-STAT.
 - 6" TOILET EXHAUST DUCT TERMINATE ON BULKHEAD ROOF. TERMINATE WITH GOOSENECK AND BIRD SCREEN.
 - PROVIDE PROGRAMMABLE THERMOSTAT WITH LOCKING COVER. COORDINATE LOCATION ON SITE WITH ARCHITECT / OWNER. SEAL WALL OPENINGS WITH CAULK. COORDINATE LOCATION ON SITE WITH GENERAL CONTRACTOR AND EQUIPMENT. AVOID LOCATING NEAR OR ABOVE SOURCES OF HEAT.
 - ALL OUTSIDE AIR INTAKE ON THE ROOF SHALL BE MINIMUM 10 FEET AWAY FROM ANY EXHAUST SOURCE. IF NOT, MAINTAIN MINIMUM 3 FEET VERTICAL DISTANCE FROM ANY EXHAUST SOURCE.
 - ALL EXHAUST AIR SOURCES ON THE ROOF SHALL BE MINIMUM 10 FT AWAY FROM OUTSIDE AIR INTAKE. IF NOT, MAINTAIN 3 FEET VERTICAL DISTANCE. TERMINATE WITH GOOSENECK AND BIRD SCREEN.
 - PROVIDE STRUCTURAL SUPPORT AS REQUIRED.
 - CONTRACTOR TO CONNECT CONDENSATE DRAIN FROM RTU TO NEAREST ROOF DRAIN OR DOWN SPOUTS. CONTRACTOR TO FIELD VERIFY.
 - PROVIDE A NEW CEILING-MOUNTED EXHAUST FAN. EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OPERATIONAL HOURS. FAN SHALL BE SUSPENDED STRUCTURE ABOVE. VERIFY EXACT LOCATION OF STRUCTURE MEMBER PRIOR TO INSTALLATION.
 - PROVIDE A NEW WALL MOUNTED EMR EXHAUST FAN. EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OPERATIONAL HOURS. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF FAN.

- MECHANICAL GENERAL NOTES**
- COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
 - EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
 - CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
 - ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.
 - TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO GENERAL CONTRACTOR AND OWNER.
 - M.C TO COORDINATE INSTALLATION OF WATER HEATER EXHAUST FLUE WITH PLUMBING CONTRACTOR.
 - ALL RTU WEIGHTS ARE INCLUDING ROOF CURBS AND/OR ADAPTORS.
 - THE CONTRACTOR SHALL VERIFY EXACT LOCATION OF TRUSSES AND MODIFY DUCTWORK ACCORDINGLY.
 - PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/ BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS.
 - PROVIDE CORD-OPERATED DAMPERS IN INACCESSIBLE CEILINGS.
 - INSTALL SPIRAL/ROUND DUCT IN OPEN AREAS AND RECTANGULAR DUCTING IN CEILING AREAS. PROVIDE INTERNAL INSULATION FOR EXPOSED DUCTING AND EXTERNAL INSULATION FOR DUCTING IN CEILING SPACE.

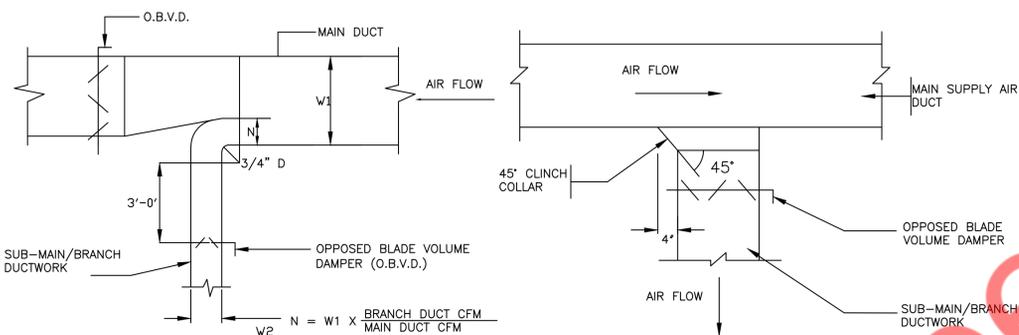


1 LOW PRESSURE BALANCING DAMPER
M5.1 N.T.S

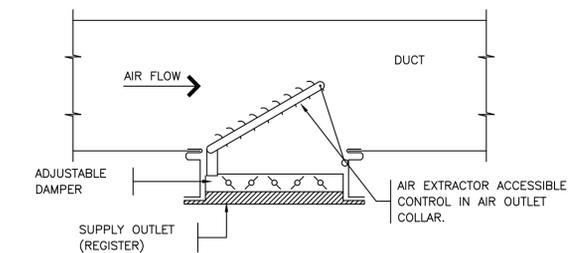
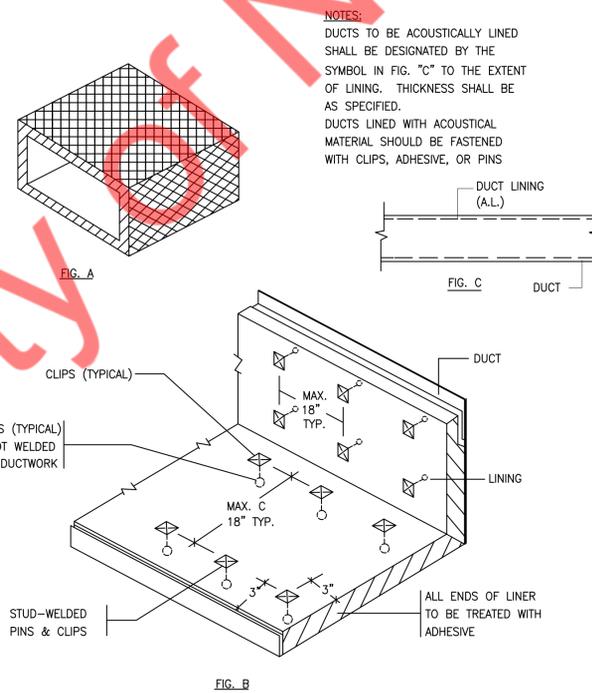
2 FLEXIBLE CONNECTION (DUCT-EQUIPMENT)
M5.1 N.T.S

3 CEILING EXHAUST FAN DETAIL
M5.1 N.T.S

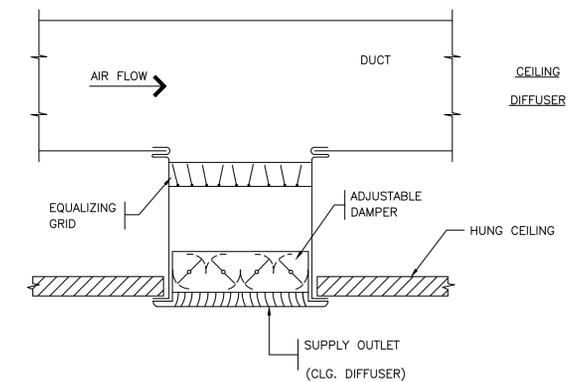
4 LOW VELOCITY DUCTWORK ELBOWS
M5.1 N.T.S



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



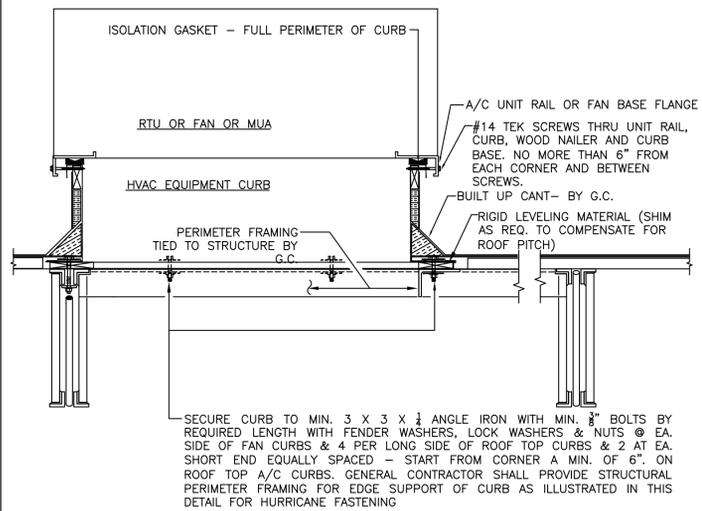
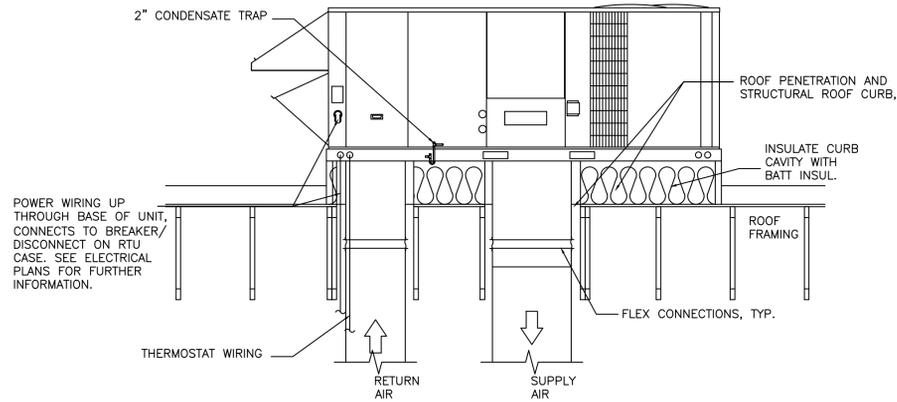
GRIDS AND DAMPERS MUST NOT DAMAGE LINERS.



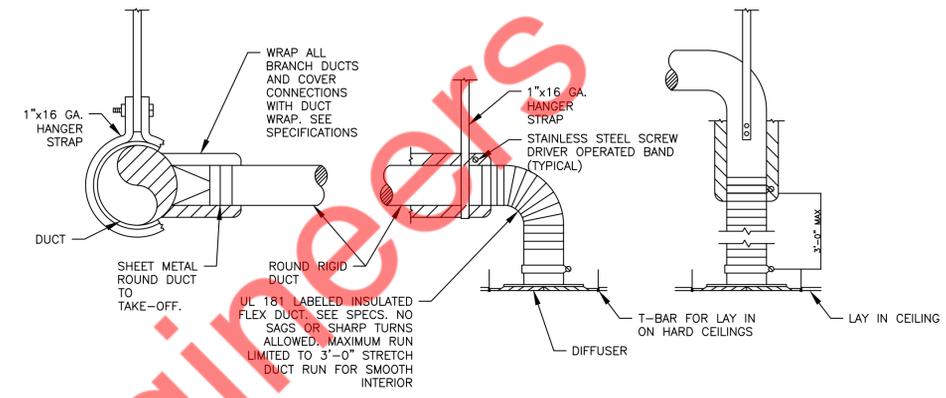
5 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
M5.1 N.T.S

6 ACOUSTICAL TREATMENT DUCT LINING
M5.1 N.T.S

7 DIFFUSER AND GRILLE REGISTER CONNECTIONS
M5.1 N.T.S



ACCEPTABLE FOR 170 MPH ZONE
VERIFY ON SITE WITH GENERAL CONTRACTOR

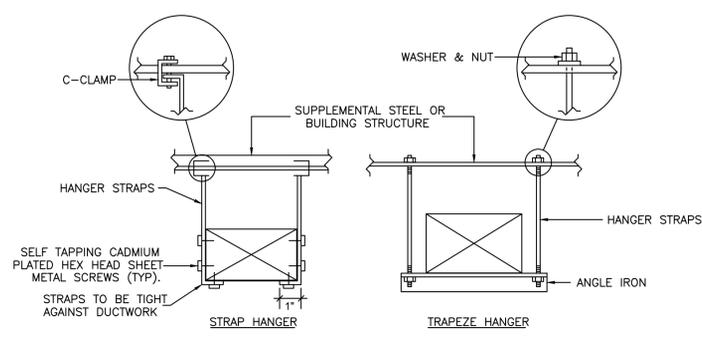


NOTES:
1. ALL JOINTS, SEAMS AND CONNECTIONS FOR DUCTS WILL BE IN ACCORDANCE WITH SECTION C403.2.9 OF FBCEC 2020 AND SECTION 603 OF FBCM 2020

1 TYPICAL ROOF TOP UNIT DETAIL
M5.2 N.T.S

2 UNIT INSTALLATION ON ROOF
M5.2 N.T.S

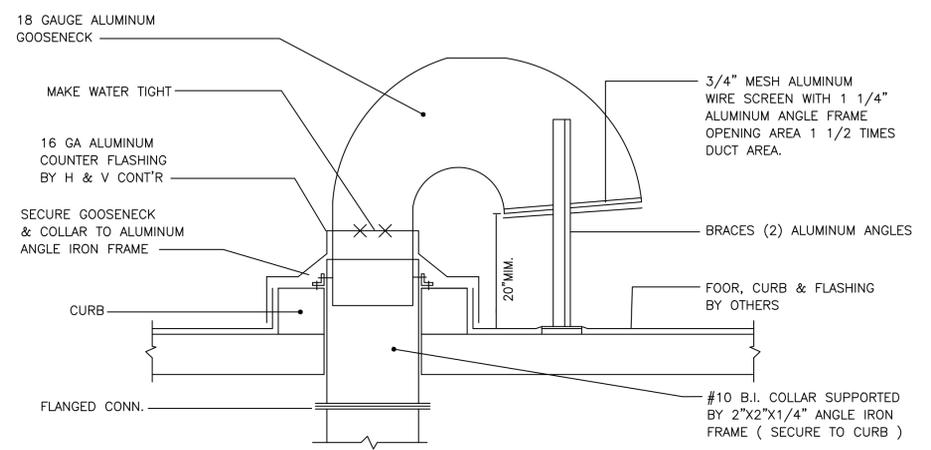
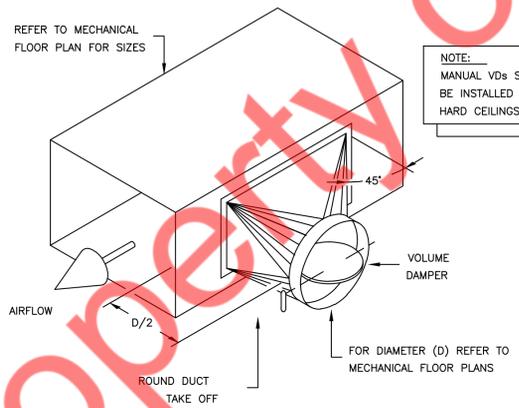
3 TYPICAL DIFFUSER CONNECTION DETAIL
M5.2 N.T.S



NOTE:
NO POP RIVETS ALLOWED, USE SELF-TAPPING SHEETMETAL SCREWS ONLY.

HANGER SIZES*			
MAX. SIDE	HANGER	HORIZONTAL SUPPORT ANGLE	MAXIMUM SPACING
30"	1"x18" GAUGE STRAP	NONE REQUIRED	10'-0"
36"	1/4" ROD	1-1/2"x1-1/2"x1/8"	8'-0"
48"	1/4" ROD	2"x2"x1/8"	8'-0"
60"	5/16" ROD	2"x2"x1/8"	8'-0"
84"	3/8" ROD	2"x2"x1/8"	8'-0"

* FOR RECTANGULAR DUCTS

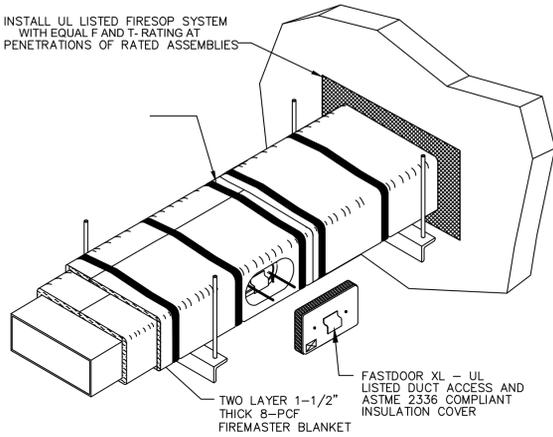


4 DUCT HANGER DETAIL
M5.2 N.T.S

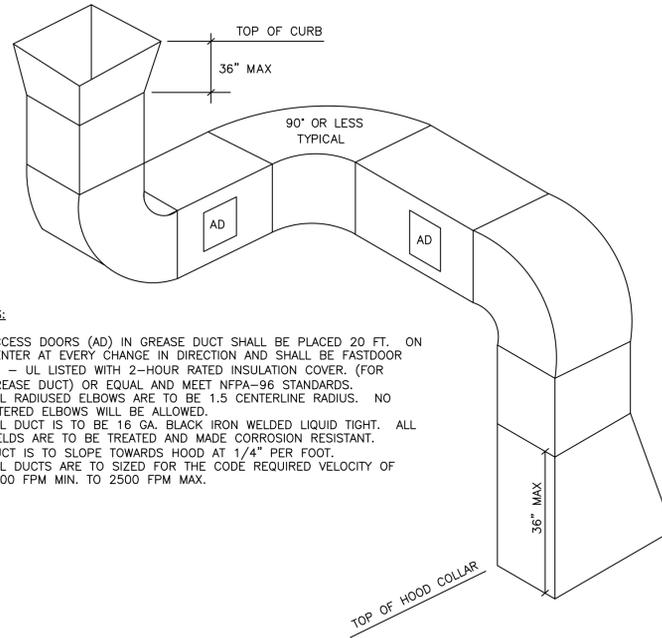
5 ROUND DUCT TAKE OFF DETAIL
M5.2 N.T.S

6 TYPICAL DETAIL OF ROOF GOOSENECK
M5.2 N.T.S

INSTALL UL LISTED FIRESOP SYSTEM WITH EQUAL F AND T-RATING AT PENETRATIONS OF RATED ASSEMBLIES



FASTDOOR XL - UL LISTED DUCT ACCESS AND ASTM E 2336 COMPLIANT INSULATION COVER
TWO LAYER 1-1/2" THICK 8-PCF FIREMASTER BLANKET



NOTES:

1. ACCESS DOORS (AD) IN GREASE DUCT SHALL BE PLACED 20 FT. ON CENTER AT EVERY CHANGE IN DIRECTION AND SHALL BE FASTDOOR XL - UL LISTED WITH 2-HOUR RATED INSULATION COVER. (FOR GREASE DUCT) OR EQUAL AND MEET NFPA-96 STANDARDS.
2. ALL RADIUSSED ELBOWS ARE TO BE 1.5 CENTERLINE RADIUS. NO MITERED ELBOWS WILL BE ALLOWED.
3. ALL DUCT IS TO BE 16 GA. BLACK IRON WELDED LIQUID TIGHT. ALL WELDS ARE TO BE TREATED AND MADE CORROSION RESISTANT.
4. DUCT IS TO SLOPE TOWARDS HOOD AT 1/4" PER FOOT.
5. ALL DUCTS ARE TO BE SIZED FOR THE CODE REQUIRED VELOCITY OF 1500 FPM MIN. TO 2500 FPM MAX.

1 KITCHEN EXHAUST DUCT DETAILS
M5.3 N.T.S

2 TYPICAL GREASE DUCT DETAIL
M5.3 N.T.S

Property of NY Engineers

ROOF TOP UNIT SCHEDULE																									
UNIT ID	MANUFACTURER	MODEL	AREA SERVED	COMPRESSOR	NOMINAL TONS	SUPPLY FAN			GAS HEAT		COOLING				ELECTRICAL				OPERATING WEIGHT (LBS)	NOTES					
						TOTAL CFM	OUTSIDE AIR CFM	EXTERNAL STATIC PRESSURE(IN. W.G.)	INPUT MBH	OUTPUT MBH	TOTAL MBH	SENSIBLE MBH	AMBIENT DB (°F)	ENTERING DB / WB(°F)	STAGES	VOLTS	PHASE	MCA(A)			MOC(P)(A)	EER	IEER	SEER	STEADY STATE EFFICIENCY %
RTU-1	CARRIER	48FCEB04 (OR EQUIVALENT)	SEE PLAN	SCROLL	3	1200	200	1	110	93	35.1	25.4	95	80/67	1	208-230	3	25	30	11.5	-	14	80	800	1-18
RTU-2	CARRIER	48FCM08 (OR EQUIVALENT)	SEE PLAN	SCROLL	7.5	3000	400	1	180	148	90.5	66	95	80/67	2	208-230	3	44	50	11.2	15	-	82	1100	1-18
RTU-3	CARRIER	48FCM08 (OR EQUIVALENT)	SEE PLAN	SCROLL	7.5	3000	400	1	180	148	90.5	66	95	80/67	2	208-230	3	44	50	11.2	15	-	82	1100	1-18
RTU-4	CARRIER	48FCEB04 (OR EQUIVALENT)	SEE PLAN	SCROLL	3	1200	250	1	110	93	35.1	25.4	95	80/67	1	208-230	3	25	30	11.5	-	14	80	800	1-18

NOTES / ACCESSORIES -

- ALL EQUIPMENT MUST BE EFFICIENT, MEETING OR EXCEEDING THE MINIMUM REQUIREMENTS.
- ELECTRICAL CONNECTION TO BE SINGLE POINT AND TO BE THROUGH THE BOTTOM OF THE UNIT.
- PROVIDE DISCONNECT SWITCH AND AN UNPOWERED GFCI RECEPTACLE.
- 14" ROOF CURB - CONTRACTOR SHALL FIELD INSULATE, SHIP ASAP AHEAD OF THE UNIT.
- CONDENSATE DRAIN WITH 2" DEEP VENTED TRAP DISCHARGE TO SPLASH BLOCK ON ROOF.
- CABINET WITH 1/2" FIBERGLASS INSULATION.
- UNIT SHALL BE COMPLETE WITH GAS HEATING SECTION, GAS REGULATOR TO RECEIVE (4.5-14") GAS PRESSURE FROM MAIN.
- DRY BULB ECONOMIZER WITH BAROMETRIC RELIEF / 25% MANUAL OUTSIDE AIR DAMPER ASSEMBLY WITH HOOD (ZONE 'E' ONLY).
- ECONOMIZER WITH FAULT DETECTION AND DIAGNOSTICS (FDD) SYSTEM.
- PROVIDE 8-WIRE, 24 VAC, AUTOMATIC CHANGEOVER, 2-STAGE HEAT / COOL, REMOTELY PROGRAMMABLE THERMOSTAT.
- REMOTE SENSORS SHALL BE PROVIDED IN RETURN DUCT WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.
- ANTI SHORT CYCLE TIMER.
- THROWAWAY 2" FILTERS (MERV 8).
- WHERE REQUIRED, PROVIDE LOW AMBIENT COOLING CAPABILITY DOWN TO 0 DEGREES F.
- PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
- RETURN AND / OR SUPPLY AIR SMOKE DETECTOR - UNIT MOUNTED.
- PROVIDE CARRIER - HOT GAS REHEAT WITH ASSOCIATED CONTROLS AND SENSORS FOR DEHUMIDIFICATION CONTROL. HOT GAS REHEAT SHALL BE LIMITED TO MAXIMUM 50% OF TOTAL CAPACITY.
- PLUMBING CONTRACTOR TO COORDINATE EXACT GAS REQUIREMENTS OF RTU'S INSTALLED ON SITE.

KITCHEN MAKE UP AIR UNIT SCHEDULE																		
TAG	SERVICE	FLOW RATE CFM	EXTERNAL STATIC PRESSURE IN W.G.	SPEED RPM	HEATING CAPACITY			TEMP. RISE DEG F	EFFICIENCY (%)	FAN DATA				WEIGHT (LBS)	BASIS OF DESIGN		REMARK	
					INPUT CAPACITY MBH	OUTPUT CAPACITY MBH	GAS PRESSURE IN W.C.			FLA	MCA (A)	MOC(P) (A)	HP		BHP	V/PH/HZ		MANUFACTURER
KMUA-1	HOOD-1&2	3186	0.375	1245	196.116	180.427	7-14	55°F	92	6.1	7.7	15	2.00	1.07	208/3/60	900	CAPTIVEAIRE EA2-D.250-20D	1,2,3

NOTES:

- PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
- REFER TO HOOD SHEETS ON M7.1 TO M7.2 FOR DETAIL INFORMATION.
- CONTRACTOR TO PROVIDE MAKE UP AIR UNIT SELECTION EQUIVALENT TO ABOVE SELECTION.

EXHAUST FAN SCHEDULE												
TAG	QUANTITY	FLOW RATE CFM	EXTERNAL STATIC PRESSURE IN W.G.	SPEED RPM	ELECTRIC DATA			MAXIMUM LOUDNESS DBA	BASIS OF DESIGN		WEIGHTS (LBS)	REMARK
					V/PH/HZ	WATTS(W)	FLA (AMPS)		MANUFACTURER	MODEL		
EF-1	1	70	0.3	1100	115/1/60	20	0.18	35	GREENHECK	SP-A125	17	1,2,3,4
EF-2	1	70	0.3	1100	115/1/60	20	0.18	35	GREENHECK	SP-A125	17	1,2,3,4
EF-3	1	70	0.3	1100	115/1/60	20	0.18	35	GREENHECK	SP-A125	17	1,2,3,4
EF-4	1	200	0.3	860	115/1/60	1/8 (HP)	-	55	GREENHECK	AER-20-03-0606	70	1,3,4

NOTES:

- PROVIDE FACTORY MOUNTED AND INSTALLED WEATHER PROOF DISCONNECT SWITCH.
- PROVIDE THERMAL OVERLOAD PROTECTION, BACKDRAFT DAMPER, AMCA SEAL & UL CERTIFIED.
- PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
- ALL TOILET EXHAUST FAN & EMR EXHAUST FAN SHALL RUN CONTINUOUSLY DURING OPERATING HOURS OF STORE.

HOOD SCHEDULE											
UNIT ID	MANUFACTURER	LENGTH (FEET-INCH)	MODEL	TYPE	COOKING		EXHAUST			CONSTRUCTION	WEIGHT (LBS)
					TEMPERATURE (DEG F)	AIR (CFM)	COLLAR (INCH)	VELOCITY (FPM)	E.S.P (IN. W.G.)		
HOOD-1	ECON-AIR	10' 0"	5424 EX-2-PSP-F	1	450	2000	16"	1432	0.776	430 STAINLESS STEEL	944
HOOD-2	ECON-AIR	9' 11"	5425 EX-2-PSP-F	1	450	1983	16"	1420	0.816	430 STAINLESS STEEL	537

KITCHEN EXHAUST FAN SCHEDULE											
TAG	QUANTITY	FLOW RATE CFM	EXTERNAL STATIC PRESSURE IN W.G.	SPEED RPM	ELECTRIC DATA			BASIS OF DESIGN		WEIGHTS (LBS)	REMARK
					V/PH/HZ	MOTOR HP	FLA (AMPS)	MANUFACTURER	MODEL		
KEF-1	1	3983	1.75	950	208/3/60	5	15.8	ECON-AIR	EADU240H	361	1-3

NOTES:

- SEE ECON-AIR HOOD DRAWING FOR ADDITIONAL INFORMATION.
- INSTALL AS PER MANUFACTURER'S RECOMMENDATION.
- PROVIDED WEIGHT IS INCLUDED ROOF CURB.

AIR CURTAIN SCHEDULE						
MANUFACTURER	UNIT ID	MODEL	LENGTH (IN.)	CFM	V/PH/HZ	AMPS
MARS	ACH-1	LPV272-1U-OB	72	1800	115/1/60	2.6
MARS	ACH-2	LPV272-1U-OB	72	1800	115/1/60	2.6
MARS	ACH-3	LPV272-1U-OB	72	1800	115/1/60	2.6

NOTES / ACCESSORIES:

- PROVIDE MANUFACTURER RECOMMENDED ACCESSORIES.
- COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER REQUIREMENT.

ELECTRIC WALL HEATERS SCHEDULE										
UNIT TAG	SERVING	TYPE	KW	BTU/HR	ELECTRIC DATA	AMPS	QTY (NOS)	DIMENSIONS (WXHXD)	MODEL NO.	MAKE
EW-1	SEE PLAN	WALL MOUNTED	1	3413	120/1/60	8.4	1	11"X12"X5"	CWH1101DSAF	QMARK
EW-2	SEE PLAN	WALL MOUNTED	2	6826	208/1/60	9.6	1	11"X12"X5"	CWH1208DSAF	QMARK

NOTES:

- PROVIDE DISCONNECTION SWITCH.
- "HEATER ON" PILOT LIGHT.
- THREE-POSITION SELECTOR SWITCH (HEATER-STANDBY-FAN)
- BUILT-IN THERMOSTAT 40F TO 85 F RANGE.
- ALL UNIT HEATERS SHALL BE INSTALLED IN ACCORDANCE WITH THE LISTING AND MANUFACTURER'S INSTALLATION INSTRUCTIONS.

AIR TERMINAL DEVICES SCHEDULE							
TAG	SIZE (IN.)	DESCRIPTION	CONSTRUCTION	FINISH	BASIS OF DESIGN		NOTES
					MANUFACTURER	MODEL	
S-1	24X24	SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	TITUS	TMS-AA	1,2,3,4,5,7,8
S-2	12X12	SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	TITUS	TMS-AA	1,2,3,4,5,7,8
S-3	24X24	PERFORATED SUPPLY AIR DIFFUSER	ALUMINUM	WHITE	TITUS	PAR	1,2,3,4,5,7,8
S-4	20X4	ALUMINUM DIRECT SPIRAL DUCT MOUNTED DOUBLE DEFLECTION SUPPLY GRILLE	ALUMINUM	WHITE	TITUS	S300FL	4,5,6,7,8
S-5	20X6	ALUMINUM DIRECT SPIRAL DUCT MOUNTED DOUBLE DEFLECTION SUPPLY GRILLE	ALUMINUM	WHITE	TITUS	S300FL	4,5,6,7,8
R-1	24X24	RETURN AIR GRILLE	ALUMINUM	WHITE	TITUS	350FL	1,2,3,4,5,6,7,8

NOTES:-

- PROVIDE STANDARD WHITE FINISH FOR ALL AIR DEVICES UNLESS NOTED OTHERWISE ON PLAN.
- PAINT ALL SURFACES VISIBLE THROUGH FACE OF RETURN AIR GRILLE FLAT BLACK. THIS SHALL INCLUDE PIPING, CONDUIT, DUCTWORK AND STRUCTURAL MEMBERS.
- PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING.
- UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.
- COORDINATE FINAL COLOR/FINISH WITH ARCHITECT/OWNER.
- AIR DEVICE SHALL BE OF GALVANIZED FINISH WHEN INSTALLED ON EXPOSED DUCTWORK.
- MAXIMUM NOISE CRITERION RATING < 35 DBA.
- FOR SUPPLY GRILLE PROVIDE AIR SCOOP DEVICE OR VOLUME CONTROL DAMPER.
- FOR ROUND NECK DIFFUSERS: NECK SIZES SHALL BE:-
15" DIA: 901-1100 CFM
14" DIA: 601-900 CFM
12" DIA: 376-600 CFM
10" DIA: 226-375 CFM
8" DIA: 101-225 CFM
6" DIA: 0-100 CFM

AIR BALANCE					
UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1	SEE PLAN	1200	200	1000	0 CFM
RTU-2	SEE PLAN	3000	400	2600	0 CFM
RTU-3	SEE PLAN	3000	400	2600	0 CFM
RTU-4	SEE PLAN	1200	250	950	0 CFM
KMUA-1	SEE PLAN	3186	3186	-	0 CFM
KEF-1	KITCHEN	-	-	-	3983 CFM
EF-1	RESTROOMS	-	-	-	70 CFM
EF-2	RESTROOMS	-	-	-	70 CFM
EF-3	RESTROOMS	-	-	-	70 CFM
TOTAL:		11586 CFM	4436 CFM	7150 CFM	4193 CFM
BUILDING PRESSURE:				243 CFM	POSITIVE

VENTILATION CALCULATION													
ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER IMC 2015	NUMBER OF PEOPLE AS PER IMC 2015	NUMBER OF CHAIR	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2015		REQ. OA (CFM)	PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR /FIXT.)	TOTAL EXHAUST (CFM)	PROVIDED EXHAUST (CFM)	
						CFM/PEOPLE	CFM/SQ.FT						
RETAILS / GROCERY	3051	15	46	0	35	7.5	0.12	629	4436	-	-	-	
POS COUNTER	204	30	7	0	7	7.5	0.12	77		-	-	-	
TOILET-108	43	0	0	0	0	0	0	0		70	70	70	
TOILET-109	43	0	0	0	0	0	0	0		70	70	70	
KITCHEN	310	0	0	0	0	0	0	0		0.7	217	3983 CFM	
BAR	98	100	10	10	8	7.5	0.18	78		-	-	-	
DRY STORAGE	248	0	0	0	0	0	0.12	30		-	-	-	
HALLWAY	31	10	1	0	1	5	0.06	7		-	-	-	
DINING	275	70	20	14	14	7.5	0.18	155		-	-	-	
PENTHOUSE BAR	153	100	16	0	12	7.5	0.18	118		-	-	-	
TOILET-204	47	0	0	0	0	0	0	0		70	70	70	
TOTAL			1092					1092		4436	141	357	4193

FOR QUESTIONS, CALL THE
Chicago Foodservice Division
REG. 595
PHONE 630-377-1000
EMAIL: FDS@econair.com

PATENT NUMBERS
AC-FSP (UNITED STATES) - US PATENT #963000
AC-FSP (CANADA) - CA PATENT #89000
AC-FSP (EUROPE) - EP PATENT #2003000

HOOD INFORMATION - JOB#5956972

HOOD NO.	TAG	MODEL	MANUFACTURE	LENGTH	MAX. COOKING TEMP.	TYPE	APPLIANCE DUTY	SECTION	CFM	TOTAL CFM	CONDUIT PLUMBING	HOOD CONSTRUCTION	HOOD LENGTH	HOOD WIDTH	HOOD HEIGHT	HOOD WEIGHT
1	H-L	5424	ECON-AIR	10' 0"	450	I	MEDIUM	200	2000		4"	16"	1803	1432	1865	1386
2	H-R	5424	ECON-AIR	9' 0"	450	I	MEDIUM	200	1983		4"	16"	1803	1432	1865	1386

HOOD INFORMATION

HOOD TAG	TYPE	WIDTH	DEPTH	EFFICIENCY # 7	TYPE	WIRE GAUGE	LOCATION	SIZE	TYPE	SIZE	ELECTRICAL	QUANTITY	FINISH	HOOD WEIGHT
1	H-L	CAPTRATE SOLID FILTER	7' 16"	16"	4	RECESSED ROUND	NO	LEFT	16"x24"x24"	TANK FS			YES	182
2	H-R	CAPTRATE SOLID FILTER	7' 16"	16"	4	RECESSED ROUND	NO	RIGHT	16"x24"x24"	TANK FS			YES	182

HOOD OPTIONS

HOOD TAG	FIELD	SWITCHER	1800" HIGH	FRONT	LEFT	
1	H-L	BACKSPLASH	1800" HIGH	X	2300" LONG	430 SS VERTICAL
1	H-L	LEFT QUARTER END PANEL	23" TOP WIDTH, 0" BOTTOM WIDTH, 23" HIGH	430 SS	BALANCE DAMPERS	
1	H-L	RISER SENSOR	INSTALL 4IN FLEN			
1	H-L	FIELD SWAPPER	1800" HIGH	FRONT		
1	H-L	RIGHT SIDE SPLASH	1800" HIGH	X	5400" LONG	430 SS VERTICAL
1	H-L	RIGHT END STAINLESS FINISHED	1" WIDE	54" LONG	INSULATED	
1	H-L	BALANCE DAMPERS				
1	H-L	RISER SENSOR	INSTALL 4IN FLEN			

PRE-CATALOG SUPPLY PLANS (MIS)

HOOD TAG	POS	LENGTH	WIDTH	HEIGHT	TYPE	WIDTH	LENGTH	DIA	CFM	SP
1	H-L	Front	158"	24"	6"	M/A	15"	28"	800	1300'
2	H-R	Front	158"	24"	6"	M/A	15"	28"	793	1300'

ECON-AIR HOODS ARE BUILT IN COMPLIANCE WITH:
NFA #96
E.T.L. LISTED 3054904-001 TO UL 710 & UL 710 STANDARDS

ASSEMBLY INSTRUCTIONS
HANGING ANGLE MUST BE SUPPORTED WITH 1/2" x 3/8" GRADE 5 INVERTED ALL-THERMS. SANDWICH HANGING ANGLE AND CEILING ANCHOR POINTS WITH 1/2" SPACER 5 (ROUND) STEEL FLAT WASHERS AND 1/2" x 1/3 1/2" DOUBLED HEX NUT CONFIGURATION BENEATH HOOD HANGING ANGLE AND ANCHOR CEILING ANCHORS. MAXIMUM 1/4" OF EXPOSED THREADS BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 25 FT-LBS.

VERIFY CEILING HEIGHT
1/2" LAYER OF INSULATION FACED TO OUTDOOR AIR. 1/2" LAYER OF INSULATION FACED TO INDOOR AIR. 1/2" LAYER OF INSULATION FACED TO EXTERIOR SURFACES.

PLAN VIEW - HOOD #1 (H-1)
10' 0" LONG 24" WIDE 2-PSP-F

PLAN VIEW - HOOD #2 (H-2)
9' 11" LONG 24" WIDE 2-PSP-F

SECTION VIEW - MODEL 5424-2-PSP-F
HOOD #1 (H-1)

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SCALE: 3/4" = 1'-0"
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FIRE SYSTEM INFORMATION - JOB#5956972

TYPE	SIZE	TYPE	SIZE	FLOW POINTS	INSTALLATION	LOCATION	ON HOOD
1	FS-1	TANK FS	42/42/40	46	FIRE CABINET LEFT	LEFT, HOOD 1	

GAS VALVES

TYPE	SIZE	VOLTAGE	MAX. INLET PRESSURE	MAX. FLOW RATE	FLOW AT 1 IN. W.C.	FLOW AT 1/2 IN. W.C.	FLOW AT 1/4 IN. W.C.	INSTALLATION	PART NUMBER
1	1/2"	120 VAC	1/2" (0.86 BAR)	1.5 GPM	2.0 GPM	2.5 GPM	3.0 GPM	LEFT, HOOD 1	424

TANK MANUAL ACTIVATION STATION DETAIL

VERIFY GAS VALVE SIZE

LEGEND - FIRE CABINET TANK SYSTEM

- GALLOV TANK
- PRIMARY ACTUATOR RELEASE
- SECONDARY ACTUATOR RELEASE
- PRESSURE SUPERVISION SWITCH
- PRIMARY HOSE ASSEMBLY
- SECONDARY HOSE ASSEMBLY
- REMOTE MANUAL ACTIVATION DEVICE

NOTES

- FIELD PIPE DROPS AS SHOWN
- PIPING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY GAS
- FIELD INSTALLED DROP FACTORY WILL PROVIDE DRY 2' GOIN LONG PIECES OF CHROME
- FIELD INSTALLED DROP FACTORY WILL PROVIDE DRY 2' GOIN LONG PIECES OF CHROME
- FIELD INSTALLED DROP FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED
- SHIPPED LEGS TO BE FIELD-INSTALLED
- SHIPPED LEGS TO BE FIELD-INSTALLED
- RELOCATING NOZZLES IF FLOW PATTERNS IS BLOCKED BY SHELVING, SALAMANDERS, ETC.
- DEVELOPING COVERAGE SHALL NOT BE USED IN ANY APPLIANCE WITH AN OBSTRUCTION
- IF APPLICABLE, EXTENDED PIPE-PIPED DROPS ARE SHIPPED LEGS
- 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 UL 300 REQUIREMENTS
- UL-F NOZZLE PART NUMBER REPLACES 3078-3/8-10-SS
- JOB # 5956972
- JOB NAME: SAVY PROVISIONS, CHARLOTTE
- SYSTEM SIZE: TANK-SP-3 TOTAL LOP REQUIRED: 46'
- HOOD # 1: 10' 0" LONG x 24" WIDE x 24" HIGH
- HOOD # 2: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 3: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 4: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 5: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 6: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 7: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 8: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 9: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 10: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 11: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 12: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 13: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 14: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 15: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 16: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 17: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 18: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 19: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 20: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 21: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 22: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 23: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 24: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 25: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 26: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 27: 9' 11" LONG x 24" WIDE x 24" HIGH
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- HOOD # 33: 9' 11" LONG x 24" WIDE x 24" HIGH
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- HOOD # 40: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 41: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 42: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 43: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 44: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 45: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 46: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 47: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 48: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 49: 9' 11" LONG x 24" WIDE x 24" HIGH
- HOOD # 50: 9' 11" LONG x 24" WIDE x 24" HIGH

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EXHAUST FAN INFORMATION - JOB#5956972

FAN UNIT NO.	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	HPM	HP	BHP	PHASE	VOLTS	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	CONES
1	KEF-1	1	EAD504H	ECON-AIR	3983	1.750	950	100	100	3PHASE	208	15.8	905 FPM	333	17.8

MIA FAN INFORMATION - JOB#5956972

FAN TAG	QTY	FAN UNIT MODEL #	BLOWER HOUSING	MIN CFM	DESIGN CFM	ESP	HPM	HP	BHP	PHASE	VOLTS	FLA	MCA	WEIGHT (LBS)	CONES					
2	KMA-1	1	642-5250-200	20W-2-MOD	AD-2350	2000	3086	0.375	1245	DDP	208V	2.000	1.070	3	208	63	7.7A	15A	744	103

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO.	TAG	INPUT BTU/H	OUTPUT BTU/H	TEMP. RISE	REQUIRED INPUT GAS	GAS TYPE	BURNER EFFICIENCY
2	KMA-1	12616	18047	55°F	7 IN. W.C. - 14 IN. W.C.	NATURAL	92

FAN OPTIONS

FAN UNIT NO.	TAG	QTY	DESCRIPTION
1	KEF-1	1	1. GREASE BOX 2. FAN BASE (GRAPE SEAL - SHIP LEGS) - FOR GREASE DUCTS 3. 2 YEAR PARTS WARRANTY 4. 1/2" METRIC GRADE 5-20" 5. HANDLES (PRESSURE GRADE) - 15" TO 15" VC 6. BUTTERFLY MESH VALVE OPTION FOR MESH SIZE 2" (1" MESH VALVE) 7. SHIP LEGS (GAS STRAINER) 8. MOTORIZED BACKDRIFT DAMPER FOR A2-D HOUSING - MEETS AMCA CLASS 1A RATING 9. INSULATION OPTION (OP - SHANK FLEX SECTION) 10. 1/2" INCHER HANGING OPTION - INCLUDES 2 HEADS HANGING SPRING ISOLATORS PER UNIT-STRUT 11. SEPARATE LOW VIBRATION PACKAGE (ORDERED AND USED ONLY FOR 30V DR PREVIEW WITH VFD) - THREE PHASE ONLY 12. 2" DIRECT FIRE HEATER LOW CFM PROFILE PACKAGE - USED ON HEATERS UNDER 2500 CFM 13. 2" INCHER HANGING OPTION 14. 2 YEAR PARTS WARRANTY

FAN ACCESSORIES

FAN UNIT NO.	TAG	EXHAUST	SUPPLY
1	KEF-1	GREASE GRABBER	WALL MOUNT
2	KMA-1	YES	YES

CURB ASSEMBLIES

NO.	ON	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	48 LBS	CURB	30 1/2" W x 25 1/2" H x 24 1/2" D

HINGE KIT INSTALLATION

EXHAUST FAN KIT

FEATURES:

- DIRECT DRIVE CONSTRUCTION AND BELTS/FELLS
- ROOF MOUNTED
- RESTAURANT HOOD
- VALVE AND AIR AND LEAD-SEALS
- VARIABLE SPEED CONTROL
- INTERNAL WINDSTOP
- HEATING GAS PROTECTION (SHOCK PHASE)
- HIGH HEAT OPERATION (SOFT CAPS)
- GREASE COLLECTION TESTING
- NEW 30 SAFETY DISCONNECT SWITCH

ABNORMAL FLAME-UP TEST

DISCONNECT SWITCH

WARRANTY

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EXHAUST FAN INFORMATION - JOB#5956972

FAN UNIT NO.	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	HPM	HP	BHP	PHASE	VOLTS	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	CONES
1	KEF-1	1	EAD504H	ECON-AIR	3983	1.750	950	100	100	3PHASE	208	15.8	905 FPM	333	17.8

MIA FAN INFORMATION - JOB#5956972

FAN TAG	QTY	FAN UNIT MODEL #	BLOWER HOUSING	MIN CFM	DESIGN CFM	ESP	HPM	HP	BHP	PHASE	VOLTS	FLA	MCA	WEIGHT (LBS)	CONES					
2	KMA-1	1	642-5250-200	20W-2-MOD	AD-2350	2000	3086	0.375	1245	DDP	208V	2.000	1.070	3	208	63	7.7A	15A	744	103

GAS FIRED MAKE-UP AIR UNIT(S)

FAN UNIT NO.	TAG	INPUT BTU/H	OUTPUT BTU/H	TEMP. RISE	REQUIRED INPUT GAS	GAS TYPE	BURNER EFFICIENCY
2	KMA-1	12616	18047	55°F	7 IN. W.C. - 14 IN. W.C.	NATURAL	92

FAN OPTIONS

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FAN ACCESSORIES

FAN UNIT NO.	TAG	EXHAUST	SUPPLY
1	KEF-1	GREASE GRABBER	WALL MOUNT
2	KMA-1	YES	YES

CURB ASSEMBLIES

NO.	ON	TAG	WEIGHT	ITEM	SIZE
1	# 1	KEF-1	48 LBS	CURB	30 1/2" W x 25 1/2" H x 24 1/2" D

HINGE KIT INSTALLATION

EXHAUST FAN KIT

FEATURES:

- DIRECT DRIVE CONSTRUCTION AND BELTS/FELLS
- ROOF MOUNTED
- RESTAURANT HOOD
- VALVE AND AIR AND LEAD-SEALS
- VARIABLE SPEED CONTROL
- INTERNAL WINDSTOP
- HEATING GAS PROTECTION (SHOCK PHASE)
- HIGH HEAT OPERATION (SOFT CAPS)
- GREASE COLLECTION TESTING
- NEW 30 SAFETY DISCONNECT SWITCH

ABNORMAL FLAME-UP TEST

DISCONNECT SWITCH

WARRANTY

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REVISIONS

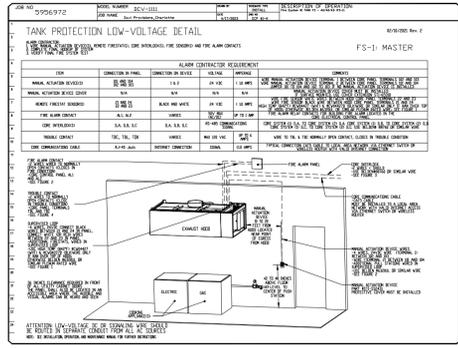
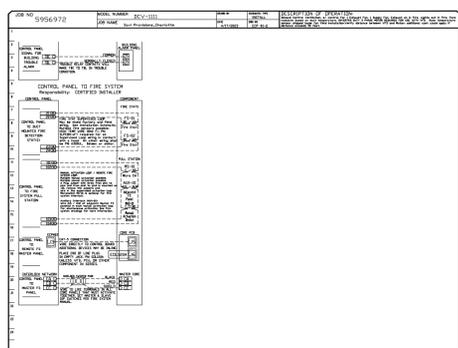
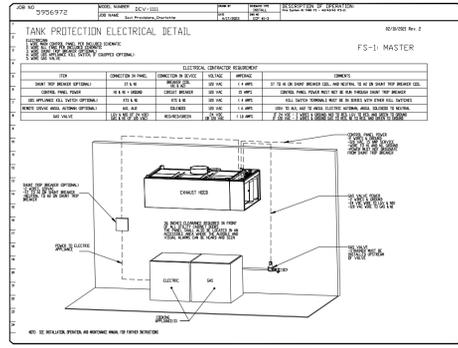
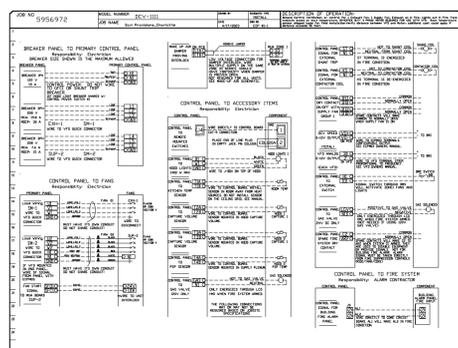
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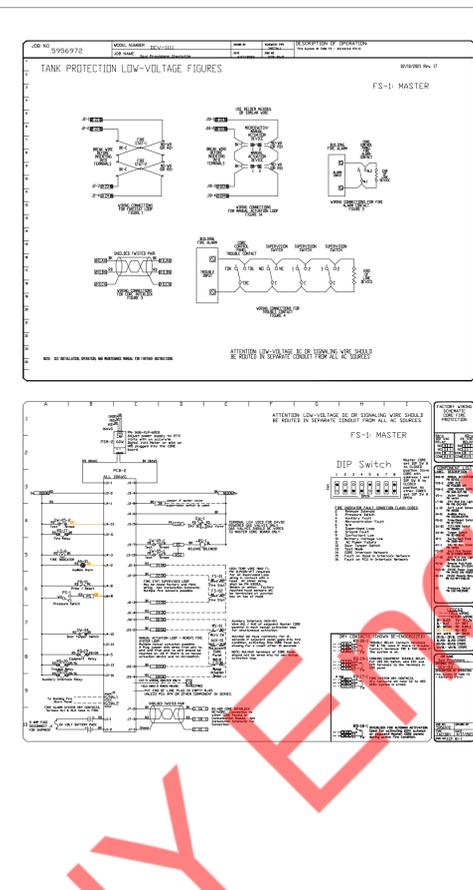
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ELECTRICAL PACKAGE - JOB#556972

Table with columns: NO, TAG, PACKAGE, LOCATION, QUANTITY, OPTION, FAN CONTROLLER, FAN TAG, FAN TYPE, FAN SPEED, FAN VOLTAGE.



REVISIONS table and econ·air logo with contact information.



DEMAND CONTROL VENTILATION (DCV) CONTROL PANEL SPECIFICATIONS text and 3D model of the control panel.

REVISIONS table and econ·air logo with contact information.

Property of NYELECTRICAL

ELECTRICAL SYMBOLS LIST

GENERAL NOTES

LIGHTING		POWER AND TELECOMMUNICATION		ELECTRICAL ABBREVIATIONS			
	LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.		JUNCTION BOX WITH BLANK COVER PLATE	A	AMPERES	EA	EACH
	LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE SCHEDULE.		SIMPLEX RECEPTACLE, +18" AFF OR AS NOTED. SUFFIXE DENOTES FOLLOWING: A- NEMA 5-15R B- NEMA 6-15R C- NEMA 14-30R D- NEMA 14-50R	A/C, AC	AIR CONDITIONING UNIT	EM	EMERGENCY
	CIRCUIT NUMBER : INDICATED BY NUMBER		DUPLEX GFI RECEPTACLE	AF	AMPERE FRAME/AMP FUSE	EMT	ELECTRICAL METALLIC TUBING
	SWITCHING INDICATED BY LOWER CASE LETTERS.		DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.	AFF	ABOVE FINISHED FLOOR	EQUIP	EQUIPMENT
	EM DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.		SPECIAL RECEPTACLE AS NOTED	AS	AMP SWITCH	ER	EXISTING TO BE RELOCATED
	NL DENOTES FIXTURES DESIGNATED AS NIGHTLIGHT, WIRED TO 24 HOURS UNSWITCHED CIRCUIT.		DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.	AIC	AMPS INTERRUPTING CAPACITY	FA	FIRE ALARM
	CEILING/WALL MOUNTED SELF POWERED EXIT LIGHT FIXTURE WITH DIRECTIONAL ARROWS AS INDICATED. SHADED AREA DENOTES FACE(S). ISOLITE ELITE SERIES LED EXIT SIGN		TELEPHONE OUTLET	AT	AMP TRIP	E	EXISTING
SWITCHES AND CONTROLS		MOTORS AND CONTROLS		ATS	AUTOMATIC TRANSFER SWITCH	FL	FLOOR
	20A SPST TOGGLE SWITCH U.O.N. "g" DENOTES LIGHTING FIXTURE/SWITCHED RECEPTACLE CONTROLLED.		AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.	AUTO	AUTOMATIC	G	GROUND
	20A 3-WAY TOGGLE SWITCH U.O.N. "g" DENOTES LIGHTING FIXTURE CONTROLLED		AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.	AWG	AMERICAN WIRE GAUGE	GFI	GROUND FAULT INTERRUPTER
	CEILING OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE. 'A' LETTER REFERES TO WIRING DIAGRAM.		NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.	C	CONDUIT	GP	GENERAL PURPOSE
WIRING SYSTEMS			30A/208V NON FUSED DISCONNECT SWITCH	C/B,CB	CIRCUIT BREAKER	HP	HORSEPOWER
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.		60A/208V NON FUSED DISCONNECT SWITCH	CKT	CIRCUIT	HW	HOW WATER HEATER
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 Ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.		100A/208V NON FUSED DISCONNECT SWITCH	CLG	CEILING	HZ	HERTZ
	CONDUIT AND WIRE TO BUILDING GROUND.		200A/208V NON FUSED DISCONNECT SWITCH	COMM	COMMUNICATION	IC	INTERRUPTING CAPACITY
---	UNDERGROUND		FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.	CT	CURRENT TRANSFORMER	PP	POWER PANEL
----	EXISTING		DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.	CU	COPPER	PWR	POWER
----	NEW		ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING	DIA	DIAMETER	R	REMOVE
ELECTRICAL DRAWING LIST			THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.	DISC	DISCONNECT	RE	RELOCATED EXISTING
			MANUAL MOTOR SWITCH	DN	DOWN	REC	RECEPTACLE
			KEYED NOTE REFERENCE	DP	DISTRIBUTION PANEL	RGS	RIGID GALVANIZED STEEL
			DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM	DWG	DRAWING	RR	REMOVE & RELOCATE
E0.1	ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES	ANNOTATION		JB	JUNCTION BOX	SECT	SECTION
E0.2	ELECTRICAL SPECIFICATIONS SHEET 1 OF 2		INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.	KCMIL	ONE THOUSAND CIRCULAR MILS	SPDT	SINGLE POLE DOUBLE THROW
E0.3	ELECTRICAL SPECIFICATIONS SHEET 2 OF 2		NEUTRAL	KV	KILOVOLT	SPST	SINGLE POLE SINGLE THROW
E1.0	ELECTRICAL LIGHTING PLAN		MAIN CIRCUIT BREAKER	KVA	KILOVOLT-AMPERES	SPEC	SPECIFICATION
E2.1	ELECTRICAL POWER PLAN		MAJOR ELECTRICAL COMPONENT OR DEVICE. VOLTAGE AND AMPERAGE AS NOTED.	KW	KILOWATTS	SW	SWITCH
E2.2	ELECTRICAL POWER PLAN		DISTRIBUTION PANELBOARD, 120/208V OR AS NOTED-SURFACE OR FLUSH MOUNTED.	LTG	LIGHTING	SWBD	SWITCHBOARD
E3.0	ELECTRICAL DETAILS			MAX	MAXIMUM	SYM	SYMMETRICAL
E4.0	ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE			MC	MOTOR CONTROLLER	SYS	SYSTEMS
E4.1	PANEL SCHEDULE			MCB	MAIN CIRCUIT BREAKER	TELE	TELEPHONE
E4.2	PANEL SCHEDULE			MLO	MAIN LUGS ONLY	TEMP	TEMPERATURE
				MTD	MOUNTED	TXF	TOILET EXHAUST FAN
				MTS	MANUAL TRANSFER SWITCH	TYP	TYPICAL
				N	NEUTRAL	UON	UNLESS OTHERWISE NOTED
				NIC	NOT IN CONTRACT	V	VOLT/VOLTAGE
				NTS	NOT TO SCALE	VA	VOLT AMPERE
				PNL	PANEL	WP	WEATHER PROOF
				W	WATT	Ø	PHASE

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

ELECTRICAL SPECIFICATIONS (CONT.)

- 3) BOXES:
- OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.
 - JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.
- C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.
- PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR THROUGH-THE-FLOOR SYSTEMS, UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.
- SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK. MACHINE SCREWS ON METAL. BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPATES.
- EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.
- MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.
- EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.
- RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED. EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS. FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.
- CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.
- ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.
- EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.
- RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.
- D. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.
- INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN TABLE 300.19(A).
- ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.
 - PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.
 - FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.
 - PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.
9. WIRE AND CABLE:
- PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.
 - CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.
 - CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.
 - INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).
 - COLOR CODING SHALL BE AS FOLLOWS:

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

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

WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.
 - PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.
 - TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.
 - NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
 - LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
 - PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

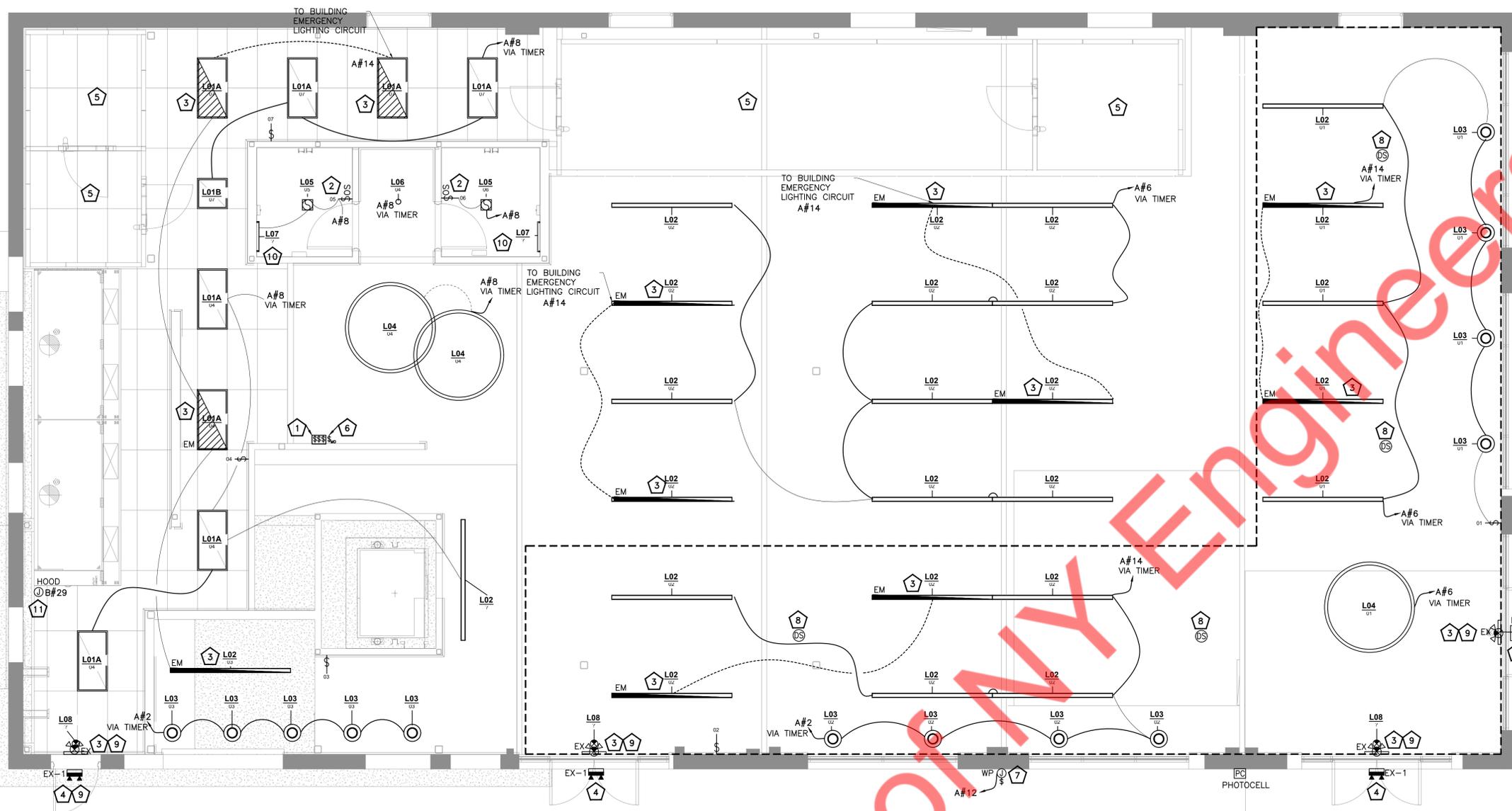
PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.
11. WIRING DEVICES:
- WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.
 - LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/208 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).
 - STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.

1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING, 15A, 125V, NEMA 5-20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE: TAMPER RESISTANT.
 - DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.
 - COLORS: COORDINATE COLORS WITH ARCHITECT.
 - MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.
12. LIGHTING FIXTURES:
- FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.
 - FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.
 - BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, E11 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.
 - LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.
 - DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE. DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.
 - CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.
 - FLUORESCENT LIGHTING FIXTURES, INCLUDING GENERAL CONSTRUCTION, LAMPS AND BALLASTS SHALL CONFORM TO THE ENERGY EFFICIENCY REQUIREMENTS OF CONSOLIDATED EDISON CO. AND QUALITY FOR A UTILITY REBATE TO OWNER UNDER CON EDISON'S ENLIGHTENED ENERGY LIGHTING REBATE PROGRAM. CONTRACTOR SHALL COORDINATE REBATE PROGRAM WITH CON EDISON AND ARRANGE FOR CON EDISON TO PERFORM A SURVEY TO INVENTORY ALL EXISTING FIXTURES PRIOR TO DEMOLITION.
 - EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED. AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.
13. TELEPHONE CONDUIT SYSTEM:
- PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.
 - EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.
 - OUTLETS SHALL BE:

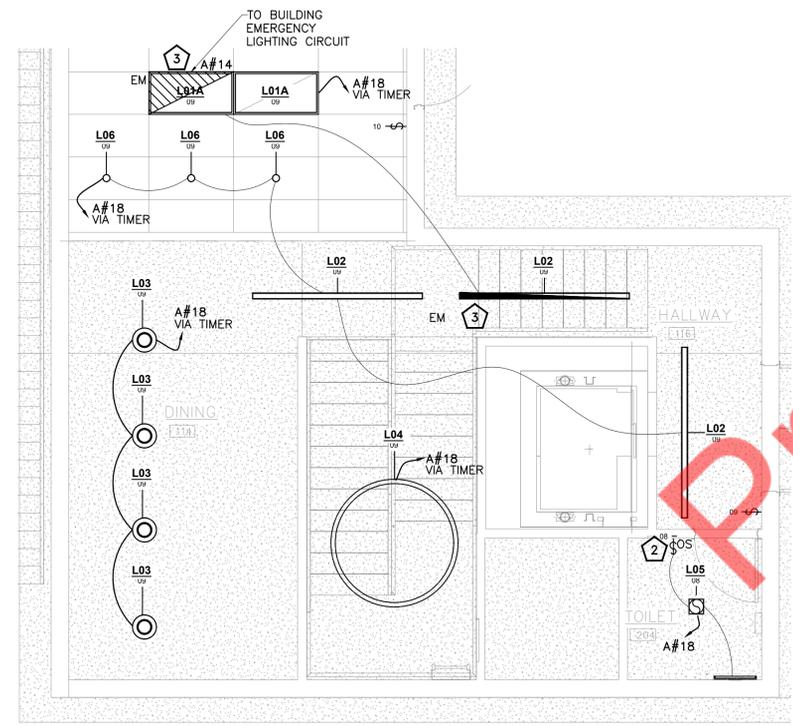
1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.
 - PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.
 - CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.
 - FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.
14. GROUNDING AND BONDING:
- PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH (2017) NATIONAL ELECTRICAL CODE), AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM, WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.
 - USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.
 - EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.
 - WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.
 - IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:

1) CIRCUITS SERVING ANY WALL BOX DIMMER.

2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES.
- TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE, OR AS OTHER WISE NOTED ON DRAWINGS.
- 3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES
- 4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.



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



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

LIGHTING PLAN GENERAL NOTES:

- CONTRACTOR IS ADVISED THAT ADJUSTMENTS TO EMERGENCY AND EXIT LIGHT FIXTURE LOCATIONS/QUANTITIES MAY BE REQUIRED BY AHJ UPON FINAL INSPECTION.
- ALL NIGHT LIGHT, EMERGENCY AND EXIT LIGHT FIXTURES SHALL BE CONNECTED AHEAD OF SWITCHED LIGHTING CIRCUIT.
- NO UNIT EQUIPMENT IN SPACE, MUST TIE IN EMERGENCY LIGHTS TO NEC 700/701 SYSTEM OF THE BUILDING STATEMENT AND SCHEDULE OF SPECIAL INSPECTIONS IS REQUIRED FOR FIRE-STOPPING.NCSBC 1705'

LIGHTING FIXTURES GENERAL NOTES:

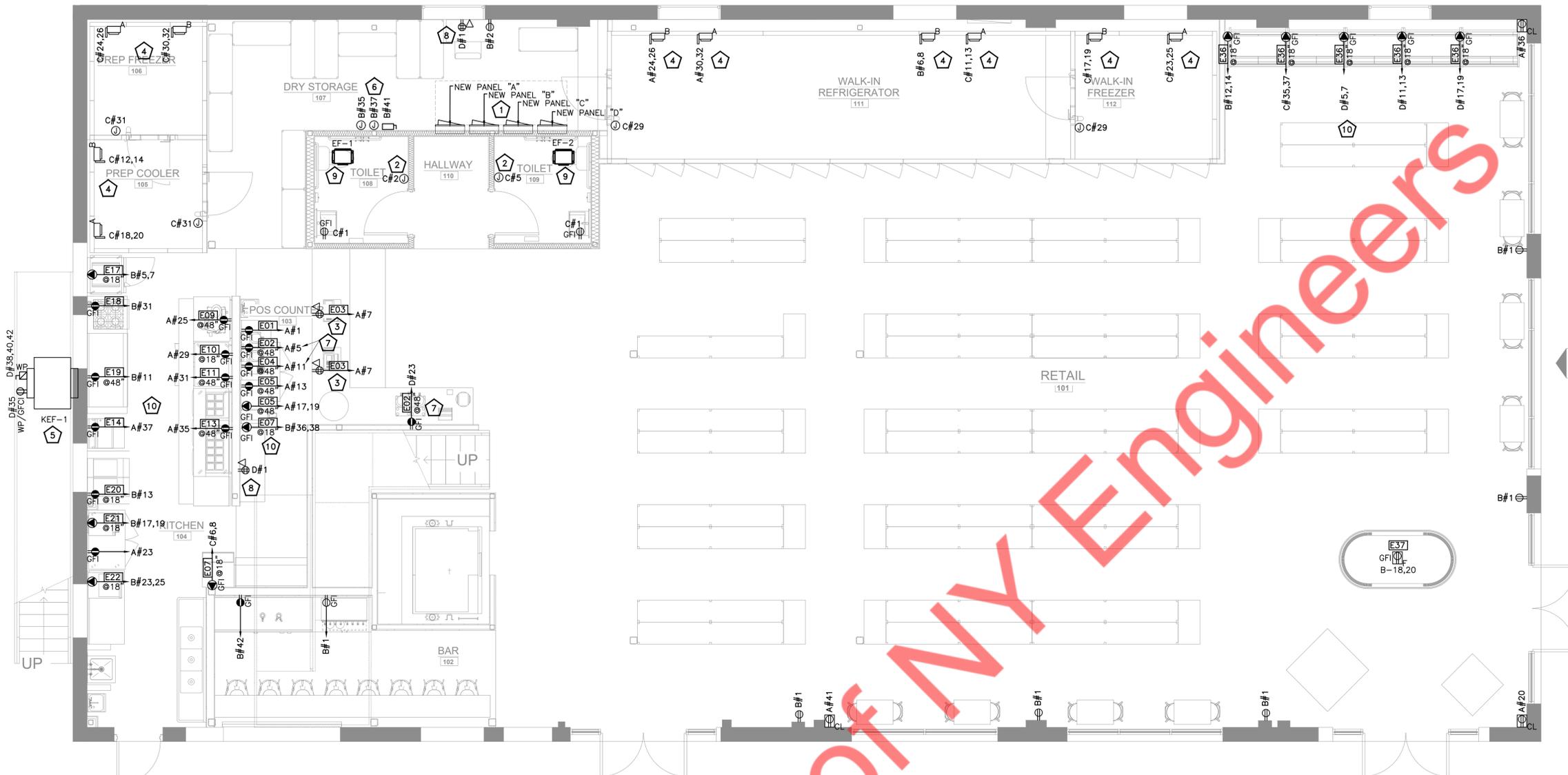
- VERIFY ALL LUMINAIRE COLORS, TRIMS, LENGTHS, ETC. WITH THE ARCHITECT PRIOR TO PLACING FINAL PURCHASE ORDERS. SUBMISSION PF SHOP DRAWINGS WILL BE INTERPRETED AS HAVING BEEN COORDINATED WITH THE ARCHITECTURAL DRAWINGS.
- PROVIDE ALL LENGTHS, FEEDS, ACCESSORIES, CONNECTORS, WIRING, POWER SUPPLIES, DRIVERS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

LIGHTING PLAN KEYED WORK NOTES:

1. TIMER SWITCH BANK FOR LIGHTING CONTROL. COORDINATE EXACT LOCATION IN FIELD.
2. WALL MOUNTED OCCUPANCY SENSOR, SET OFF TIME TO 15 MINUTES FOR RESTROOM, SET DIP SWITCH TO AUTOMATIC ON.
3. CONNECT ALL EMERGENCY EGRESS(EM) AND EXIT LIGHTS TO THE EMERGENCY CIRCUIT OF THE BASE BUILDING POWER. EMERGENCY LIGHTS CAN NOT BE CONNECTED TO THE UNIT EQUIPMENT IN A HIGH RISE BUILDING PER NEC 700/701. E.C. TO COORDINATE WITH OWNER/BASE BUILDING REPRESENTATIVE FOR LOCATING EMERGENCY LIGHTING CIRCUIT IN FIELD.
4. WEATHERPROOF EMERGENCY LIGHT FIXTURE. E.C SHALL COORDINATE WITH ARCHITECT FOR FINAL FINISH & LOCATION.
5. ALL COOLER / FREEZER LIGHTING FIXTURES AND RELATED LOCAL CONTROLS SHALL BE PROVIDED BY EQUIPMENT SUPPLIER. E.C. SHALL MAKE ALL FINAL CONNECTIONS TO FIXTURES AS REQUIRED TO ENSURE A COMPLETE OPERATION. CONNECT FIXTURES TO NEAREST 120V LIGHTING CIRCUIT.
6. MANUAL OVERRIDE SWITCH TO TURN OFF LIGHTING FIXTURES ALL AT ONCE. E.C. SHALL COORDINATE WITH THE ARCHITECT/OWNER FOR THE EXACT LOCATION OF THE SWITCH.
7. JUNCTION BOX WITH TOGGLE DISCONNECT PER NEC FOR CONNECTION TO BUILDING MOUNTED SIGNAGE. VERIFY EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURE'S INSTRUCTION. ROUTE CIRCUIT TO PANEL AS INDICATED VIA EXTERIOR LIGHTING/SIGNAGE CONTROLLER.
8. LIGHTING FIXTURES IN THE DAYLIGHT ZONE SHALL BE CONTROLLED WITH DAYLIGHT SENSOR "DS".
9. FIXTURES TO BE MOUNTED ON CEILING.
10. PROVIDE JUNCTION BOX FOR BACKLIT MIRROR. CONNECT TO NEAREST LIGHTING CIRCUIT.
11. JUNCTION BOX FOR HOOD CONTROL PANEL. COORDINATE WITH MECHANICAL CONTRACTOR, PROVIDE POWER PROVISION ACCORDINGLY.

LIGHT FIXTURE SCHEDULE				
No.	DESCRIPTION	MANUFACTURER	MODEL	COMMENTS
L01	2X4 CPX LED FLAT PANEL	LITHONIA	CPX LED FLAT PANEL	NIGHT LIGHT AS REQ.
L02	8FT LINEAR PENDANT	MARK ARCHITECTURAL	S4LI-LLP-8FT-MSL8-13 5K-BLK	WITH EXTERNAL BATTERY PACK
L03	4FT LINEAR PENDANT	MARK ARCHITECTURAL	S4LI-LLP-4FT-MSL4-13 5K-BLK	NIGHT LIGHT AS REQ.
L04	ORBIS II PENDANT	G LIGHTING	GL-2727-I-RD-1	
L05	LED TRACK (8 LAMP)	JUNO	R605L-HTYPE-30K-80C RI-PDIM-WFL-BL	13'-0" TRACK
L06	DUKE PENDANT	EUREKA	4176	DUKE
EX	EMERGENCY EXIT SIGN WITH 3.6V BATTERY BACKUP	COOPER	SURE-LITE #APCH7-R	WALL/CEILING
EX-1	LED EXTERIOR EMERGENCY FIXTURE	HUBBELL	PERHC DB OD 30	WALL/CEILING





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

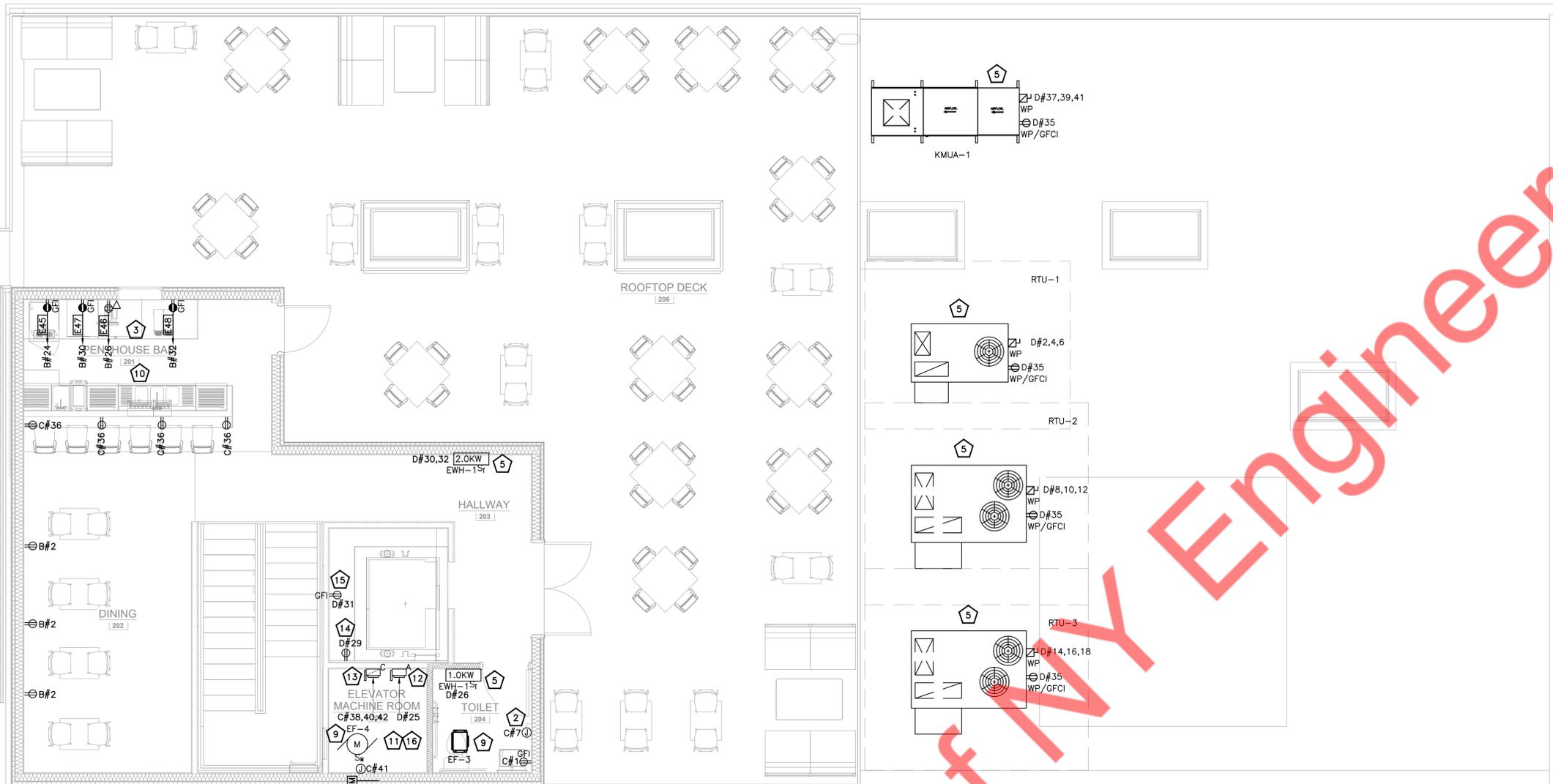
ELECTRICAL POWER PLAN GENERAL NOTES:

- E.C. SHALL COORDINATE LOCATIONS AND HEIGHT OF ALL OUTLETS WITH ARCHITECT/OWNER PRIOR TO ROUGH-IN.
- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SUPPLYING / INSTALLING ALL ELECTRICAL COMPONENTS NECESSARY TO PROVIDE POWER TO EQUIPMENT. ELECTRICAL CONTRACTOR SHALL ALSO COMPLETE ALL INTERNAL WIRING AND FINAL CONNECTIONS TO EQUIPMENT PER MANUFACTURERS SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO:
 - PROVIDING CAPS AND CORDS TO APPLICABLE EQUIPMENT
 - STAINLESS STEEL COVER PLATES WHERE REQUIRED
 - MAIN BREAKER PANELS, CONTROL PANELS, DISCONNECT SWITCHES, STARTERS, ETC.
- REFER TO ARCHITECTURAL PLANS AND / OR CONSTRUCTION DOCUMENTS FOR ANY ADDITIONAL ELECTRICAL CONNECTIONS OR OUTLETS REQUIRED TO MEET LOCAL CODES.
- ALL 120V, 15A AND 20A RECEPTACLES IN KITCHEN AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B). PROVIDE GFI RATED BREAKER AT PANEL FOR KITCHEN EQUIPMENT.

ELECTRICAL POWER PLAN KEYED WORK NOTES:

1. PROPOSED LOCATION FOR NEW ELECTRICAL PANELS. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANELS AND TRANSFORMER.
2. PROVIDE JUNCTION BOX AND CIRCUIT FOR HAND DRYER.
3. PROVIDE QUAD AND DATA OUTLET AT POS. E.C. SHALL COORDINATE WITH ARCHITECT/L.V. VENDOR FOR EXACT LOCATION AND POWER REQUIREMENT OF L.V. EQUIPMENTS PRIOR TO BID.
4. E.C. SHALL COORDINATE WITH WALK-IN BOX VENDOR FOR EXACT POWER REQUIREMENT OF EQUIPMENT. PROVIDE BREAKER UNFUSED DISCONNECT SWITCH AND CIRCUIT AS REQUIRED.
5. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF MECHANICAL EQUIPMENT.
6. E.C. SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF PLUMBING EQUIPMENT.
7. OUTLETS FOR COFFEE MACHINE (E02) AND COFFEE GRINDER (E04) SHOWN FOR REFERENCE ONLY. E.C. SHALL COORDINATE WITH MANUFACTURER FOR EXACT POWER REQUIREMENT AND PROVIDE BREAKER, BRANCH CIRCUIT AND OUTLET ACCORDINGLY.
8. PROVIDE QUAD, DATA AND TELEPHONE OUTLET AT OFFICE. E.C. SHALL COORDINATE WITH ARCHITECT/L.V. VENDOR FOR EXACT LOCATION AND POWER REQUIREMENT OF L.V. EQUIPMENTS PRIOR TO BID.
9. EXHAUST FAN IN THE ROOM SHALL BE CIRCUITED AND CONTROLLED ALONG WITH THE LIGHT FIXTURE IN THE SAME ROOM.
10. E.C. TO VERIFY EXACT LOCATION AND MOUNTING HEIGHT OF THE OUTLET WITH MANUFACTURER/ARCHITECT. PRIOR TO ROUGH-IN AND ADJUST LOCATIONS/HEIGHTS OF OUTLETS IN FIELD ACCORDINGLY.
11. E.C. SHALL COORDINATE WITH THE ELEVATOR VENDOR FOR EXACT POWER REQUIREMENT AND CONNECTION DETAILS. PROVIDE CIRCUIT AND CONTROL AS REQUIRED, PRIOR TO BID. BASE BID ACCORDINGLY.
12. ELEVATOR CAR LIGHTING CIRCUIT DISCONNECT (120V, 1Ø). TO BE LOCATED IN COORDINATION WITH THE VENDOR.
13. MAIN ELEVATOR FUSED DISCONNECT (240V, 3Ø) W/AUX DRY CONTACT. TO BE LOCATED IN COORDINATION WITH THE VENDOR. E.C. SHALL COORDINATE WITH THE VENDOR IF ADAPTIVE TRANSFORMER IS REQUIRED. PRIOR TO BID. BASE BID ACCORDINGLY.
14. TOP OF HOIST WAY CONVENIENCE RECEPTACLE, COORDINATE MOUNTING HEIGHT IN FIELD.
15. HOIST WAY PIT CONVENIENCE RECEPTACLE, COORDINATE MOUNTING HEIGHT IN FIELD.
16. PROVIDE SHUNT TRIP DEVICE AND NON FUSED DISCONNECT. IF NOT PROVIDED BY VENDOR. BASE BID ACCORDINGLY.





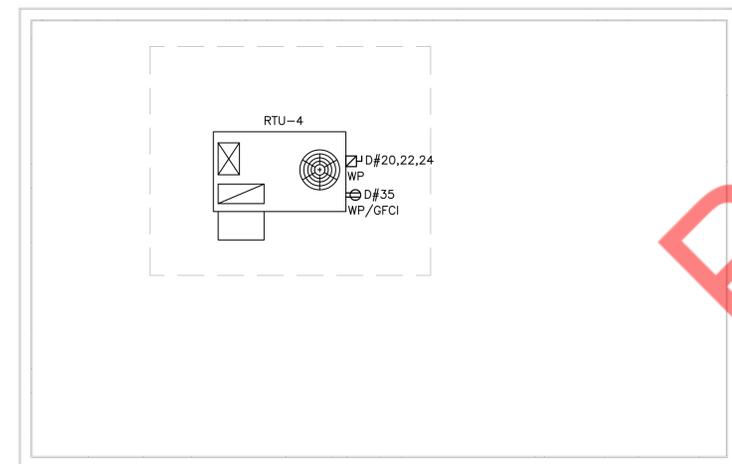
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- ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SUPPLYING / INSTALLING ALL ELECTRICAL COMPONENTS NECESSARY TO PROVIDE POWER TO EQUIPMENT. ELECTRICAL CONTRACTOR SHALL ALSO COMPLETE ALL INTERNAL WIRING AND FINAL CONNECTIONS TO EQUIPMENT PER MANUFACTURERS SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO:
 - PROVIDING CAPS AND CORDS TO APPLICABLE EQUIPMENT
 - STAINLESS STEEL COVER PLATES WHERE REQUIRED
 - MAIN BREAKER PANELS, CONTROL PANELS, DISCONNECT SWITCHES, STARTERS, ETC.
- REFER TO ARCHITECTURAL PLANS AND / OR CONSTRUCTION DOCUMENTS FOR ANY ADDITIONAL ELECTRICAL CONNECTIONS OR OUTLETS REQUIRED TO MEET LOCAL CODES.
- ALL 120V, 15A AND 20A RECEPTACLES IN KITCHEN AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B). PROVIDE GFI RATED BREAKER AT PANEL FOR KITCHEN EQUIPMENT.

ELECTRICAL POWER PLAN KEYED WORK NOTES:

- PROPOSED LOCATION FOR NEW ELECTRICAL PANELS. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANELS AND TRANSFORMER.
- PROVIDE JUNCTION BOX AND CIRCUIT FOR HAND DRYER.
- PROVIDE QUAD AND DATA OUTLET AT POS. E.C. SHALL COORDINATE WITH ARCHITECT/L.V. VENDOR FOR EXACT LOCATION AND POWER REQUIREMENT OF L.V. EQUIPMENTS PRIOR TO BID.
- E.C. SHALL COORDINATE WITH WALK-IN BOX VENDOR FOR EXACT POWER REQUIREMENT OF EQUIPMENT. PROVIDE BREAKER UNFUSED DISCONNECT SWITCH AND CIRCUIT AS REQUIRED.
- E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF MECHANICAL EQUIPMENT.
- E.C. SHALL COORDINATE WITH PLUMBING CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF PLUMBING EQUIPMENT.
- OUTLETS FOR COFFEE MACHINE (E02) AND COFFEE GRINDER (E04) SHOWN FOR REFERENCE ONLY. E.C. SHALL COORDINATE WITH MANUFACTURER FOR EXACT POWER REQUIREMENT AND PROVIDE BREAKER, BRANCH CIRCUIT AND OUTLET ACCORDINGLY.
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- EXHAUST FAN IN THE ROOM SHALL BE CIRCUITED AND CONTROLLED ALONG WITH THE LIGHT FIXTURE IN THE SAME ROOM.
- E.C. TO VERIFY EXACT LOCATION AND MOUNTING HEIGHT OF THE OUTLET WITH MANUFACTURER/ARCHITECT. PRIOR TO ROUGH-IN AND ADJUST LOCATIONS/HEIGHTS OF OUTLETS IN FIELD ACCORDINGLY.
- E.C. SHALL COORDINATE WITH THE ELEVATOR VENDOR FOR EXACT POWER REQUIREMENT AND CONNECTION DETAILS. PROVIDE CIRCUIT AND CONTROL AS REQUIRED, PRIOR TO BID. BASE BID ACCORDINGLY.
- ELEVATOR CAR LIGHTING CIRCUIT DISCONNECT (120V, 1ø). TO BE LOCATED IN COORDINATION WITH THE VENDOR.
- MAIN ELEVATOR FUSED DISCONNECT (240V, 3ø) W/AUX DRY CONTACT. TO BE LOCATED IN COORDINATION WITH THE VENDOR. E.C. SHALL COORDINATE WITH THE VENDOR IF ADAPTIVE TRANSFORMER IS REQUIRED. PRIOR TO BID. BASE BID ACCORDINGLY.
- TOP OF HOIST WAY CONVENIENCE RECEPTACLE, COORDINATE MOUNTING HEIGHT IN FIELD.
- HOIST WAY PIT CONVENIENCE RECEPTACLE, COORDINATE MOUNTING HEIGHT IN FIELD.
- PROVIDE SHUNT TRIP DEVICE AND NON FUSED DISCONNECT. IF NOT PROVIDED BY VENDOR. BASE BID ACCORDINGLY.

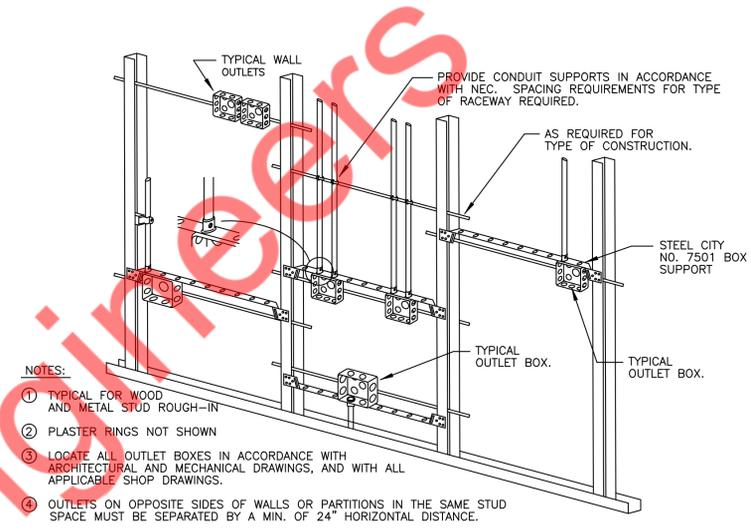
① ELECTRICAL POWER PLAN ROOF DECK
1/4" = 1'-0"



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

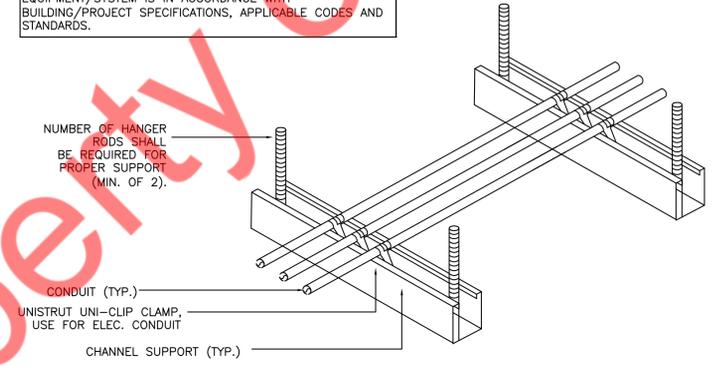
GRAPHIC SCALE: 1/4" = 1'-0"





2
E3.0 N.T.S. DETAIL TYPICAL ROUGH-IN REQUIREMENTS

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



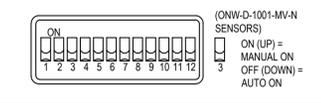
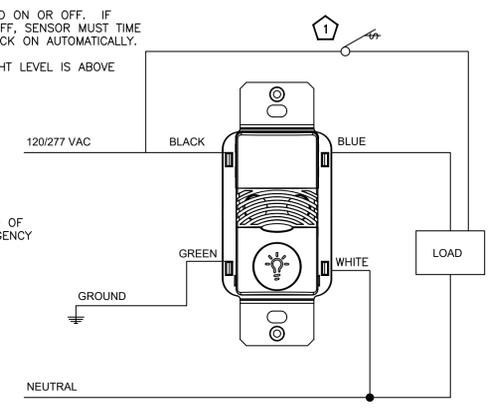
- NOTES:**
1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
 2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
 3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
 4. UNISTRUT AND CONDUIT INSTALLATION MAY BE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

3
E3.0 N.T.S. CONDUIT SUPPORT DETAIL

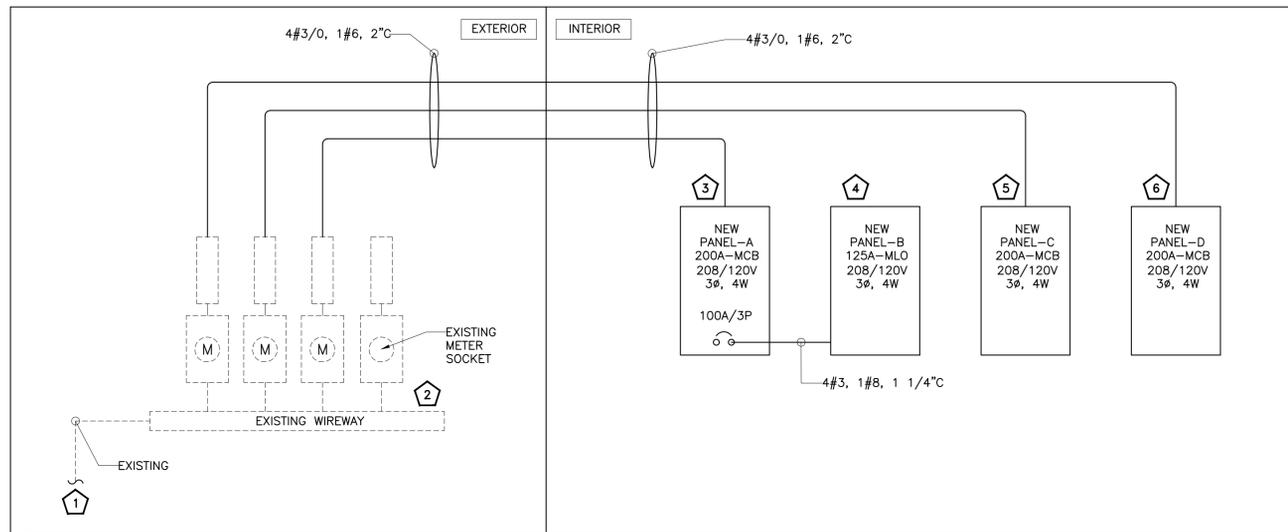
- MANUAL MODE OPERATION:**
1. PUSHBUTTON PRESS IS REQUIRED TO TURN LOAD ON.
 2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR BY PRESSING PUSH BUTTON.
 3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.
- AUTOMATIC MODE OPERATION:**
1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
 2. PUSHBUTTON CAN BE USED TO TURN LOAD ON OR OFF. IF PUSHBUTTON IS USED TO TURN LOAD OFF, SENSOR MUST TIME OUT FIRST, BEFORE LOAD CAN TURN BACK ON AUTOMATICALLY.
 3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

SENSOR TYPES INCLUDE:
ONW-D-1001-MV-N

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



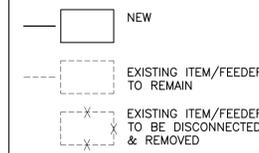
1
E3.0 N.T.S. WIRING DIAGRAM-LINE VOLTAGE WALL SWITCH SENSOR(NEUTRAL CONNECTION) OCCUPANCY/VACANCY-SINGLE LEVEL



RISER DIAGRAM KEYED WORK NOTES:

- EXISTING 208/120V, 3-PHASE HIGH LEG SERVICE FEEDER PER RECEIVED INFORMATION FOR THE PROJECT SPACE. E.C. SHALL VERIFY RATING AND OPERABLE CONDITION OF THE FEEDER IN FIELD. REPLACE IF FOUND INOPERABLE. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD. BASE BID ACCORDINGLY.
- EXISTING WIRE WAY SHALL REMAIN. E.C. SHALL VERIFY RATING AND OPERABLE CONDITION OF THE WIRE WAY IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- NEW 200A, 208/120V, 3φ, 4W ELECTRICAL PANEL "A" FOR SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL.
- NEW 125A, 208/120V, 3φ, 4W ELECTRICAL PANEL "B" FOR SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL.
- NEW 200A, 208/120V, 3φ, 4W ELECTRICAL PANEL "C" FOR SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL.
- NEW 200A, 208/120V, 3φ, 4W ELECTRICAL PANEL "D" FOR SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL.

ELECTRICAL RISER SYMBOL



RISER DIAGRAM GENERAL NOTES

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

PANEL: A (NEW)								MOUNTING: SURFACE						
120/208	VOLTS	3	PHASE	4	WIRE	PANEL LOCATION:								
MCB	200A	BUS:	200A	MINIMUM	FED FROM: EXISTING METER									
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL)														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C						
1	20	E01 - UC REFRIGERATOR	E	0.26	2#12, 1#12, 3/4" C	1.16			2#12, 1#12, 3/4" C	0.90	L	LIGHTING - BAR	20	2
3	20	HIGH LEG					0.00					HIGH LEG	20	4
5	20	E02 - CUSTOM COFFEE MAKER	E	1.10	2#12, 1#12, 3/4" C			2.00	2#12, 1#12, 3/4" C	0.90	L	LIGHTING - RETAIL/GROCERY	20	6
7	20	E03 - POS	R	0.90	2#12, 1#12, 3/4" C	1.40			2#12, 1#12, 3/4" C	0.50	L	LIGHTING - STORAGE, KITCHEN AND TOILET	20	8
9	20	HIGH LEG					0.00					HIGH LEG	20	10
11	20	E04 - CUSTOM COFFEE GRINDER	E	1.10	2#12, 1#12, 3/4" C			1.60	2#12, 1#12, 3/4" C	0.50	L	EXTERIOR BUILDING SIGNAGE	20	12
13	20	E05 - ESPRESSO MACHINE POWDER MODULE	E	0.20	2#12, 1#12, 3/4" C	0.80			2#12, 1#12, 3/4" C	0.60	L	EMERGENCY LIGHTING	20	14
15	20	HIGH LEG					0.00					HIGH LEG	20	16
17	30/2P	E05 - ESPRESSO CAPPUCCINO MACHINE	E	3.00	2#10, 1#10, 3/4" C	4.60		3.40	2#12, 1#12, 3/4" C	0.40	L	ROOF DECK LIGHTING	20	18
19			E	3.00								2#12, 1#12, 3/4" C	1.60	L
21	20	HIGH LEG					0.00					HIGH LEG	20	22
23	20	UC REFRIGERATOR	E	0.36	2#12, 1#12, 3/4" C			3.08	2#8, 1#10, 3/4" C	2.72	H	WALK-IN COOLER CONDENSING UNIT	40/2P	24
25	20	E09 - FOOD SLICER	E	0.36	2#12, 1#12, 3/4" C	3.08				2.72	H			26
27	20	HIGH LEG					0.00					HIGH LEG	20	28
29	20	E10 - REACH-IN UC FREEZER	E	0.36	2#12, 1#12, 3/4" C			1.92	2#12, 1#12, 3/4" C	1.56	H	WALK-IN COOLER EVAPORATOR	20/2P	30
31	20	E11 - WORKTOP FREEZER	E	0.69	2#12, 1#12, 3/4" C	2.25				1.56	H			32
33	20	HIGH LEG					0.00					HIGH LEG	20	34
35	20	E13 - SANDWICH/SALAD PREP. REF.	E	0.36	2#12, 1#12, 3/4" C			1.96	2#12, 1#12, 3/4" C	1.60	L	SHOW WINDOW RECEPTACLE	30	36
37	20	E14 - WORK TABLE	R	0.18	2#12, 1#12, 3/4" C	7.81				7.63	O			38
39	20	HIGH LEG							4#3, 1#8, 1 1/4" C	7.63	O	TO NEW PANEL B	100/3P	40
41	20	SHOW WINDOW RECEPTACLE	L	1.60	2#12, 1#12, 3/4" C			9.23		7.63	O			
						21.10	7.63	23.19						

PANEL: B (NEW)												MOUNTING: SURFACE		
120/208	VOLTS		3	PHASE	4	WIRE			PANEL LOCATION:					
MLO	125A		BUS: 125A		MINIMUM				FED FROM: A					
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL)														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C						
1	20	GENERAL RECEPTACLES	R	0.90	2#12, 1#12, 3/4"C	1.80			2#12, 1#12, 3/4"C	0.90	R	GENERAL RECEPTACLES	20	2
3	20	HIGH LEG					0.00					HIGH LEG	20	4
5	40/2P	E17 - CONVECTION OVEN	E	2.90	2#8, 1#10, 3/4"C			5.62	2#8, 1#10, 3/4"C	2.72	H	WALK-IN COOLER CONDENSING UNIT	40/2P	6
7			E	2.90							2.72		H	
9	20	HIGH LEG					0.00					HIGH LEG	20	10
11	20	E19 - 60" GRIDDLE	E	0.36	2#12, 1#12, 3/4"C			1.45	2#12, 1#12, 3/4"C	1.09	E	E36 - REFERIGERATED CASE (GFCI BREAKER)	20/2P	12
13	20	E20 - FRYERS, GAS	E	0.20	2#12, 1#12, 3/4"C	1.29				1.09	E			14
15	20	HIGH LEG					0.00					HIGH LEG	20	16
17	30/2P	E21 - CONVEYOR TOASTER	E	2.32	2#10, 1#10, 3/4"C			4.83	2#10, 1#10, 3/4"C	2.51	E	E37 - ISLAND DISPLAY CASE	30/2P	18
19			E	2.32							2.51		E	
21	20	HIGH LEG					0.00					HIGH LEG	20	22
23	30/2P	E22 - RAPID COOK OVEN	E	0.65	2#10, 1#10, 3/4"C			0.82	2#12, 1#12, 3/4"C	0.17	E	E45 - BEER DISPENSER	20	24
25			E	0.65							0.36	R	E46 - POS	20
27	20	HIGH LEG					0.00					HIGH LEG	20	28
29	20	HOOD POWER	O	0.50	2#12, 1#12, 3/4"C			0.77	2#12, 1#12, 3/4"C	0.27	E	E47 - REFRIGERATED BACK BAR	20	30
31	20	E18 - 4 BURNER RANGE				0.72			2#12, 1#12, 3/4"C	0.72	E	E48 - FROZEN BEVERAGE MACHINE	20	32
33	20	HIGH LEG					0.00					HIGH LEG	20	34
35	20	WH-1	O	0.10	2#12, 1#12, 3/4"C			0.50	2#12, 1#12, 3/4"C	0.40	E	E07 - UC ICE MACHINE	20/2P	36
37	20	WH-1	O	0.10	2#12, 1#12, 3/4"C	0.50				0.40	E			38
39	20	HIGH LEG					0.00					HIGH LEG	20	40
41	20	RCP-1	M	0.10	2#12, 1#12, 3/4"C			0.94	2#12, 1#12, 3/4"C	0.84	E	E - MICRO MATIC REF. WITH GLASS RINSER	20	42
						15.77	0.00	14.93						

PANEL: C (NEW)												MOUNTING: SURFACE		
120/208	VOLTS		3	PHASE	4	WIRE			PANEL LOCATION:					
MCB	200A		BUS: 200A		MINIMUM				FED FROM: EXISTING METER					
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL)														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C						
1	20	RESTROOM RECEPTACLES	R	0.54	2#12, 1#12, 3/4"C	1.74			2#12, 1#12, 3/4"C	1.20	M	HAND DRYER	20	2
3	20	HIGH LEG					0.00					HIGH LEG	20	4
5	20	HAND DRYER	M	1.20	2#12, 1#12, 3/4"C			1.60	2#12, 1#12, 3/4"C	0.40	E	E07 - UC ICE MACHINE	20/2P	6
7	20	HAND DRYER	M	1.20	2#12, 1#12, 3/4"C	1.60				0.40	E			8
9	20	HIGH LEG					0.00					HIGH LEG	20	10
11	20/2P	WALK IN COOLER EVAPORATOR	H	1.56	2#12, 1#12, 3/4"C			4.28	2#8, 1#10, 3/4"C	2.72	H	E31 - WALK-IN COOLER CONDENSING UNIT	40/2P	12
13			H	1.56							2.72		H	
15	20	HIGH LEG					0.00					HIGH LEG	20	16
17	40/2P	WALK IN FREEZER CONDENSER	H	2.80	2#8, 1#10, 3/4"C			4.36	2#12, 1#12, 3/4"C	1.56	H	E31 - WALK-IN COOLER EVAPORATOR	20/2P	18
19			H	2.80							1.56		H	
21	20	HIGH LEG					0.00					HIGH LEG	20	22
23	20/2P	WALK-IN FREEZER EVAPORATOR	H	1.56	2#12, 1#12, 3/4"C			3.12	2#12, 1#12, 3/4"C	1.56	H	E32 - WALK-IN FREEZER EVAPORATOR FOOD PREP	20/2P	24
25			H	1.56							1.56		H	
27	20	HIGH LEG					0.00					HIGH LEG	20	28
29	20	WALK-IN BOX MISC. LOAD	R	0.50	2#12, 1#12, 3/4"C			3.30	2#8, 1#10, 3/4"C	2.80	H	E32 - WALK-IN FREEZER CONDENSING UNIT FOOD PREP	40/2P	30
31	20	WALK-IN BOX MISC. LOAD FOOD PREP.	R	0.50	2#12, 1#12, 3/4"C	3.30				2.80	H			32
33	20	HIGH LEG					0.00					HIGH LEG	20	34
35	20/2P	E36 - REFERIGERATED CASE (GFCI BREAKER)	E	1.09	2#12, 1#12, 3/4"C			1.99	2#12, 1#12, 3/4"C	0.90	R	ROOF DECK GENERAL RECEPTACLES	20	36
37			E	1.09							8.40		O	
39	20	HIGH LEG					8.40		3#4, 1#8, 1"C	8.40	O	ELEVATOR POWER	80/2P	40
41	20	MOTORISED DAMPER	M	0.50	2#12, 1#12, 3/4"C			8.90		8.40	O			42
						27.89	8.40	27.55						

PANEL:	D	(NEW)					MOUNTING:		SURFACE					
120/208	VOLTS		3	PHASE	4	WIRE			PANEL LOCATION:					
MCB	200A		BUS:	200A	MINIMUM			FED FROM: EXISTING METER						
NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL)														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						A	B	C						
1	20	POS AND DESK RECEPTACLES	R	0.90	2#12, 1#12, 3/4"C	3.30								
3	20	HIGH LEG					2.40							
5	20/2P	E36 - REFERIGERATED CASE (GFCI BREAKER)	E	1.09	2#12, 1#12, 3/4"C	5.32			3.49	2.40	H	RTU-1	30/3P	4
7			E	1.09						4.23	H			6
9	20	HIGH LEG					4.23							
11	20/2P	E36 - REFERIGERATED CASE (GFCI BREAKER)	E	1.09	2#12, 1#12, 3/4"C	5.32			5.32	4.23	H	RTU-2	50/3P	8
13			E	1.09						4.23	H			10
15	20	HIGH LEG					4.23							
17	20/2P	E36 - REFERIGERATED CASE (GFCI BREAKER)	E	1.09	2#12, 1#12, 3/4"C	3.49			5.32	4.23	H	RTU-3	50/3P	12
19			E	1.09						4.23	H			14
21	20	HIGH LEG					2.40							
23	20	E02 - CUSTOM COFFEE MAKER	E	1.10	2#12, 1#12, 3/4"C				3.50	2.40	H			16
25	20	ELEVATOR CAR LIGHTING CIRCUIT	L	0.50	2#12, 1#12, 3/4"C	1.50				2.40	H			18
27	20	HIGH LEG					0.00					HIGH LEG	20	20
29	20	TOP OF HOIST WAY CONVENIENCE CIRCUIT	R	1.00	2#12, 1#12, 3/4"C			2.00		1.00	H	EWH-1	20	26
31	20	HOIST PIT CONVENIENCE CIRCUIT	R	1.50	2#12, 1#12, 3/4"C	2.50				1.00	H	EWH-2	20/2P	28
33	20	HIGH LEG					0.00					HIGH LEG	20	30
35	20	SERVICE RECEPTACLES	R	0.90	2#12, 1#12, 3/4"C			0.90				SPARE	20	32
37			H	0.92		4.64				3.72	H			34
39	20/3P	KMUA-1	H	0.92	3#12, 1#12, 3/4"C		4.64			3.72	H	KEF-1	40/3P	38
41			H	0.92						4.64	H			40
						26.07	17.90	25.17						

Property of NY Engineers

PLUMBING SYMBOLS LIST

— GSAN —	GREASE SANITARY SEWER (UNDERFLOOR)
— SAN —	SANITARY SEWER (UNDERFLOOR)
— SAN —	SANITARY SEWER (ABOVE FLOOR)
----	VENT PIPING
----	COLD WATER PIPING
----	HOT WATER PIPING
----	HOT WATER RETURN PIPING
----	EXISTING HOT WATER PIPING
----	EXISTING COLD WATER PIPING
— G —	GAS PIPING
— P —	P-TRAP
— O —	PIPE UP
— O —	PIPE DROP
— O —	CLEANOUT
— O —	PLUGGED OUTLET/CLEANOUT
— O —	POINT OF CONNECTION
— O —	RECIRCULATION PUMP
— O —	BALANCING VALVE

PLUMBING ABBREVIATIONS

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

PLUMBING DRAWING LIST

P1.1	PLUMBING NOTES, SYMBOLS, ABBREVIATIONS & SPECIFICATIONS
P2.1	FIRST FLOOR WATER SUPPLY AND GAS PIPING PLAN
P2.2	ROOF DECK WATER SUPPLY AND GAS PIPING PLAN
P2.3	FIRST FLOOR SANITARY PIPING PLAN
P2.4	ROOF DECK SANITARY PIPING PLAN
P3.1	PLUMBING DETAILS
P4.1	PLUMBING RISERS
P5.1	GAS RISERS & SCHEDULES

BUILDING DEPARTMENT PLUMBING NOTES

- ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER, STORM) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2018 NORTH CAROLINA STATE PLUMBING CODE.
- INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 702.2
- PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION PC 305.
- TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC 306.
- RODENT PROOFING AS PER PC 304
- MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303, PC 605, PC 702, PC 902, PC 1102.
- EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
- DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER PC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708
- DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 708.
- VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308
- WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION PC 601-603, 604, 606, 607, 608, 610
- THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708, 711.
- VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH PC 917
- INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION PC 107.
- GAS PIPING INSTALLATION SHALL BE IN ACCORDANCE WITH NORTH CAROLINA FUEL GAS CODE 2018.

PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

- 1.01 SCOPE
- A. PROVIDE ALL MATERIAL, TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.
- B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING AND NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.
- C. OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.
- D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.
- E. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK, THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING CONDITIONS.
- F. IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.
- G. ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.
- H. COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.
- I. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.
- J. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.
- K. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

1.02 SUBMITTALS

- A. SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION. UNLESS OTHERWISE DIRECTED, CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW.
- PIPE AND FITTINGS
 - VALVES
 - HANGERS AND SUPPORTS
 - PLUMBING PIPING LAYOUT
 - TESTS
 - PLUMBING FIXTURES
 - WATER HEATERS & ACCESSORIES
 - MIXING VALVES
 - ALL SCHEDULED PLUMBING EQUIPMENT
- B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.
- C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS' STAMP.
- D. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW, AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.
- E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.
- F. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.
- G. FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.
- H. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

1.03 SUBSTITUTIONS

- A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.
- B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

1.04 GAS PIPING:

- GAS PIPING SHALL BE SIZED IN ACCORDANCE WITH PIPE SIZING TABLES OR SIZING EQUATIONS IN ACCORDANCE WITH NORTH CAROLINA FUEL GAS CODE 2018 SECTION 402.4.
- INDIVIDUAL OUTLETS TO GAS RANGES SHALL NOT BE LESS THAN ¾ INCHES NPS.
- METALLIC PIPE SHALL COMPLY WITH SECTIONS 403.4.1 THROUGH 403.4.4.
- PIPING SYSTEM INSTALLATION SHALL COMPLY WITH REQUIREMENTS OF NORTH CAROLINA FUEL GAS CODE 2018 SECTION 404.
- SHUTOFF VALVES SHALL BE LOCATED IN PLACES SO AS TO PROVIDE ACCESS FOR OPERATION AND SHALL BE INSTALLED SO AS TO BE PROTECTED FROM DAMAGE.
- AS PER INTERNATIONAL FUEL GAS CODE, SECTION 404.6; UNDERGROUND PIPING, WHERE INSTALLED BELOW GRADE THROUGH THE OUTER FOUNDATION OR BASEMENT WALL OF A BUILDING, SHALL BE ENCASED IN A PROTECTIVE PIPE SLEEVE. THE ANNULAR SPACE BETWEEN THE GAS PIPING AND THE SLEEVE SHALL BE SEALED.
- PIPING INSTALLED UNDERGROUND BENEATH BUILDINGS IS PROHIBITED EXCEPT WHERE THE PIPING IS ENCASED IN A CONDUIT OF WROUGHT IRON OR STEEL PIPE DESIGNED TO WITHSTAND THE SUPERIMPOSED LOADS. THE CONDUIT SHALL BE PROTECTED FROM CORROSION IN ACCORDANCE WITH SECTION 404.14 AND SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 404.14.1 OR 404.14.2 OF NORTH CAROLINA FUEL GAS CODE 2018.
- AS PER INTERNATIONAL FUEL GAS CODE SECTION 404.12; UNDERGROUND PIPING SYSTEMS SHALL BE INSTALLED A MINIMUM DEPTH OF 12 INCHES BELOW GRADE.
8. THE GAS PIPING IS ENCASED IN A CONDUIT OF WROUGHT IRON OR STEEL PIPE TO WITH STAND THE SUPERIMPOSED LOADS.

1.05 DEFINITIONS

- A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.
- B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.
- C. PROVIDE: TO FURNISH AND INSTALL.
- D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.

1.06 DRAWINGS

- A. THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUSTRATE THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GENERAL LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPMENT, RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL PIPING SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHITECT, ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXISTING AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF THE OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHALL BE INSTALLED CONCEALED IN FINISHED SPACES, UNLESS NOTED OTHERWISE.
- B. PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVEN IF NOT PARTICULARLY SHOWN OR SPECIFIED.
- C. REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAWINGS FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS.
- D. REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR ALL FIXTURE ROUGHING SIZE REQUIREMENTS.
- E. VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDITIONS WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY THE OWNER.
- F. LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE FINAL ARCHITECTURAL DRAWINGS.

1.07 PRODUCTS

- A. SANITARY AND VENT PIPING:
- SANITARY PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING.
 - SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
 - ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.
- B. DOMESTIC WATER PIPING:
- ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
 - FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
 - JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
 - THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
 - COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
 - ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (IECC 2015) C403.2.10 REFER BELOW TABLE.

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	MINIMUM PIPE INSULATION THICKNESS		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	INSULATION CONDUCTIVITY BTU?IN./ (H?FT2°F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8	>8
141-200	0.25-0.29	125	1.5	1.5	2	2	2
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0

7. WATER DISTRIBUTION SYSTEM AS PER 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (IECC 2015) C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
- THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
 - THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).
8. AS PER 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (IECC 2015) C404.6.1 HEATED-WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.
9. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (IECC 2015) C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
½"	2'	4'
¾"	0.5'	20'
1"	0.5'	13'
1½"	0.5'	8'
1½"	0.5'	6'
2" OR LARGER	0.5'	4'

10. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.
11. PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.
- C. HANGERS AND SUPPORTS:

- HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
- SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
- ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.
- PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

D. VALVES:

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

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

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

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

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

- I. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

- K. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

- N. ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.

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

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

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

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

2. INSTALLATION

2.01 GENERAL

- S. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.
- T. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.
- U. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.
- V. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.
- W. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND FERROUS END PIPE.
- X. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.
- Y. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.
- Z. COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.
- AA. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.
- AB. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

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

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

2.02 ABOVE GRADE

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

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

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

3. TESTING

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

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

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

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

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

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

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

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

- J. ALL EQUIPMENT WILL BE FACTORY TESTED.

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

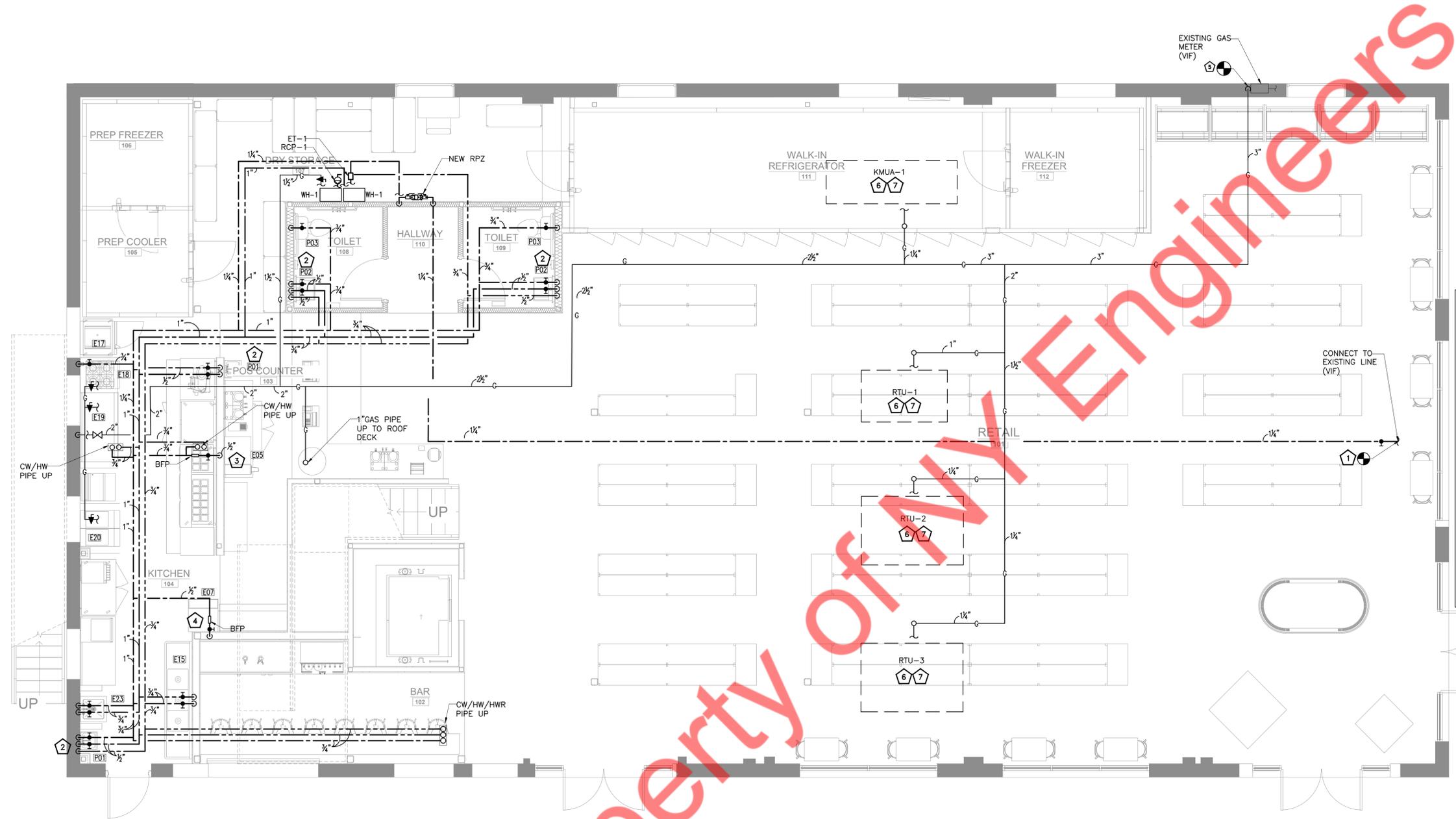
- K. REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.

- L. TESTING REQUIREMENTS
- TEST ALL DOMESTIC WATER PIPING SHALL BE TESTED AND PROVED TIGHT UNDER A WATER OR AN AIR TEST OF NOT LESS THAN 100PSI.
 - THIS PRESSURE SHALL BE HELD FOR NOT LESS THAN 15 MINUTES.
 - TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
 - THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

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

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

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

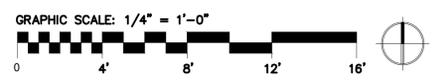


- GENERAL NOTES:**
1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (IECC 2015)(REFER SHEET P1.1)
 2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
 3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
 5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
 6. WATER HEATER DRAIN SPILLS TO THE FLOOR DRAIN.
 7. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SUPPORTS FOR WATER HEATER AS PER SELECTED MODEL REQUIREMENT.

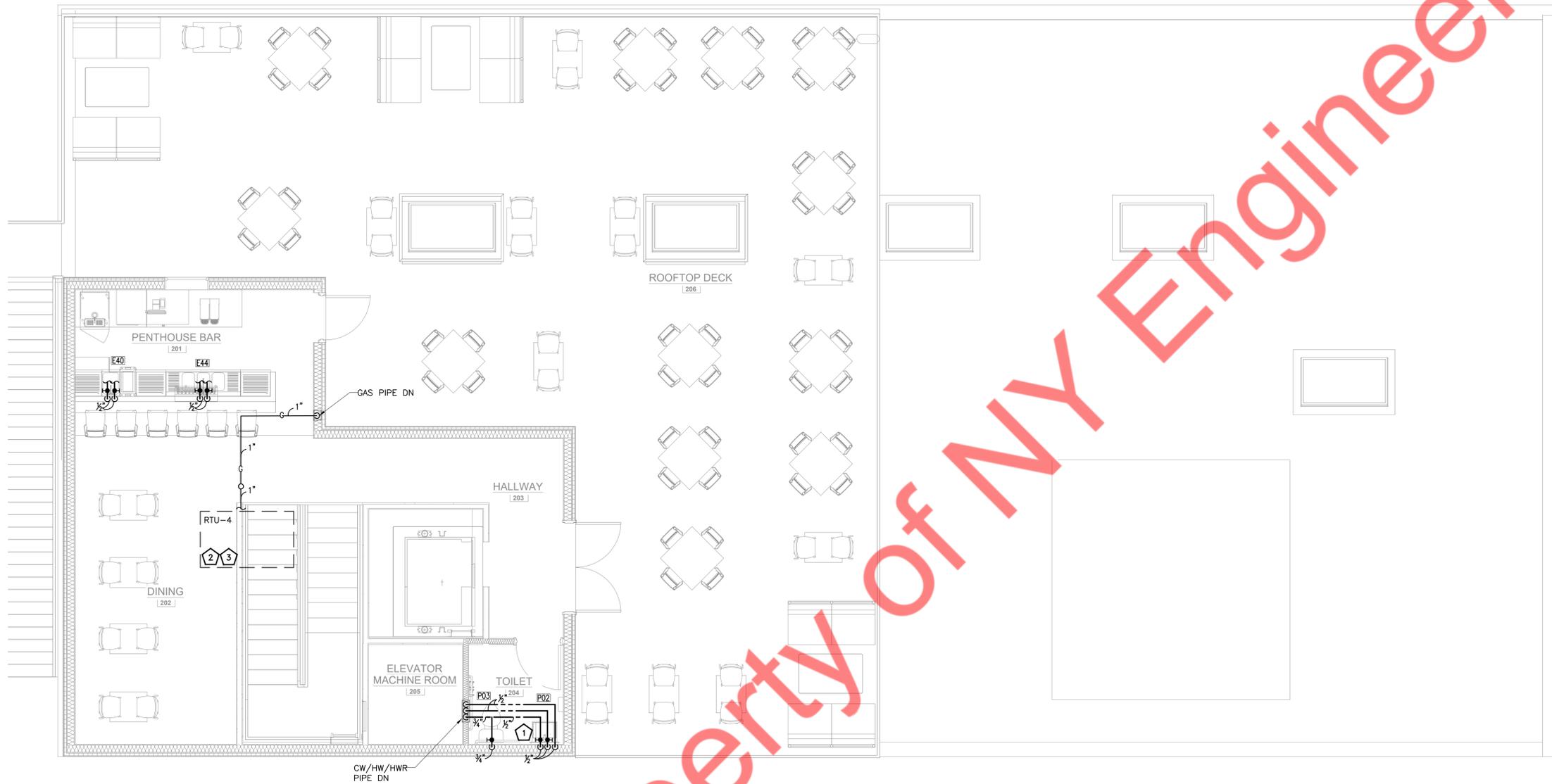
- WATER AND GAS KEYED NOTES:**
1. ROUTE NEW 1-1/4" CW PIPING WITH SHUT OFF VALVE AND TIE-INTO THE EXISTING WATER LINE. CONTRACTOR TO FIELD CONFIRM, VERIFY EXISTING WATER LINE AND EXISTING WATER SUB-METER SIZE, LOCATION AND UPGRADE IF REQUIRED. BASE BIDE ACCORDINGLY.
 2. PROVIDE A TEMPERING VALVE FOR LAVATORIES AND HAND SINK. POWER HYDROGUARD SERIES LFLM495, ASSE. 1070 OR EQUAL. SET TEMPERATURE TO A MAXIMUM OF 110° F.
 3. PROVIDE APPROVED ASSE 1022 BACKFLOW PREVENTER OR EQUIVALENT FOR ESPRESSO MACHINE.
 4. PROVIDE APPROVED ASSE 1012 BACKFLOW PREVENTER OR EQUIVALENT FOR ICE MACHINE.
 5. CONNECT NEW 3" GAS LINE TO EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY GAS METER CAPACITY IS EQUAL TO OR GREATER THAN 1546 CFH REQUIRED. COORDINATE ALL WORK WITH UTILITY COMPANY AND LANDLORD.
 6. CONTRACTOR TO FIELD VERIFY AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR KMAU-1, RTU-1, RTU-3, KITCHEN GAS EQUIPMENT AND WATER HEATER.
 7. EXTEND GAS LINE TO KMAU-1, RTU-1, RTU-2, RTU-3. PROVIDE GAS SHUTOFF VALVE, UNION AND DIRTLEG.

① FIRST FLOOR WATER SUPPLY AND GAS PIPING PLAN
1/4" = 1'-0"

Property of M Engineers



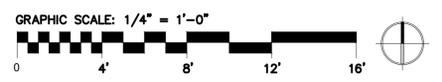
Property of NY Engineers



- GENERAL NOTES:**
1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2018 NORTH CAROLINA ENERGY CONSERVATION CODE (ECC 2015)(REFER SHEET P1-1)
 2. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 3. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
 4. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.

- WATER AND GAS KEYED NOTES:**
- 1 PROVIDE A TEMPERING VALVE FOR LAVATORIES AND HAND SINK. POWER HYDROGUARD SERIES LFLM495, ASSE. 1070 OR EQUAL. SET TEMPERATURE TO A MAXIMUM OF 110° F.
 - 2 CONTRACTOR TO FIELD VERIFY AVAILABLE GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE REQUIRED FOR RTU-4.
 - 3 EXTEND GAS LINE TO RTU-4 .PROVIDE GAS SHUTOFF VALVE, UNION AND DIRTLEG.

① ROOF DECK WATER SUPPLY AND GAS PIPING PLAN
1/4" = 1'-0"

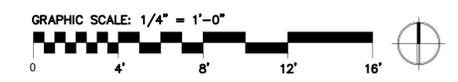


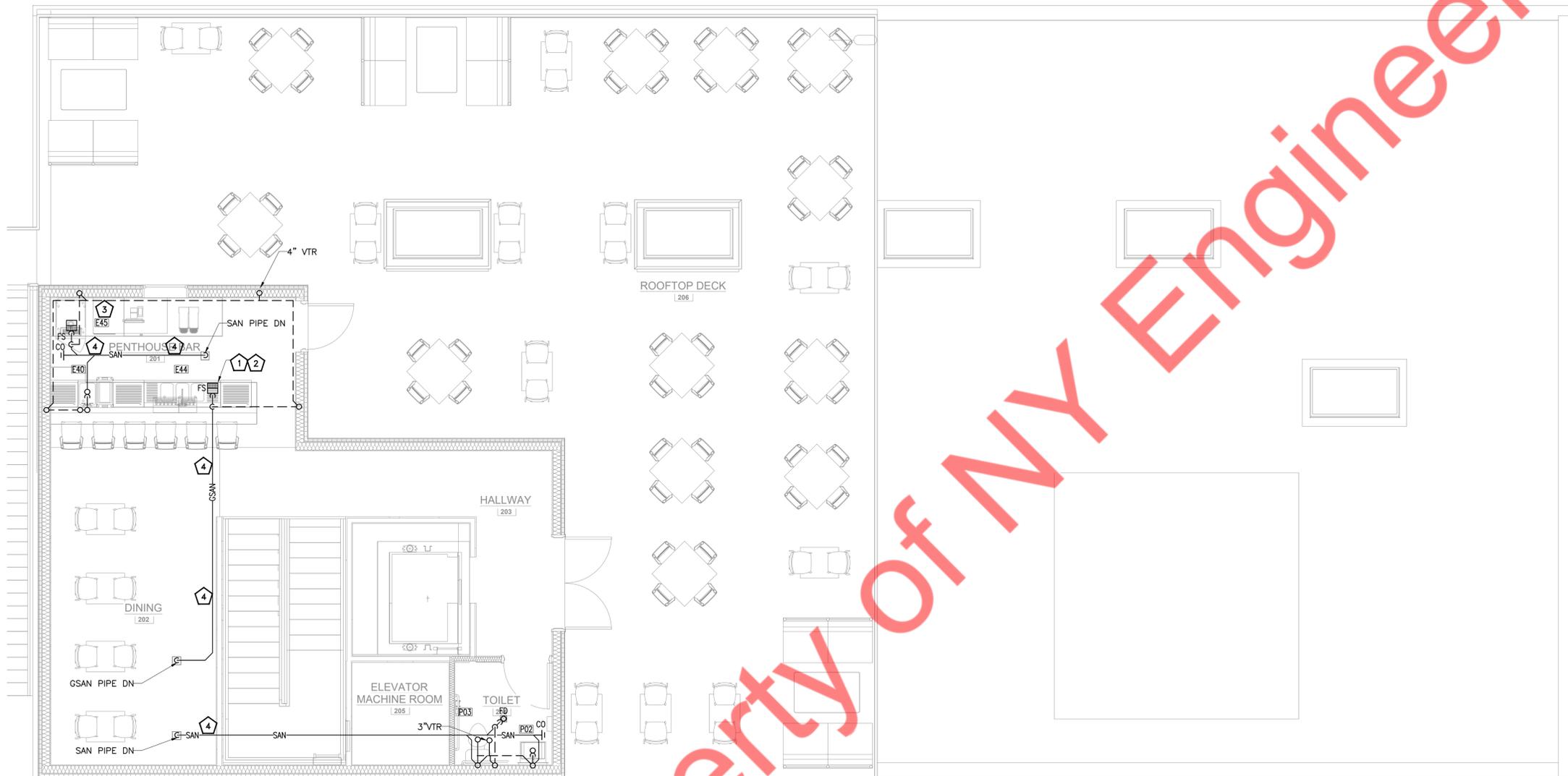


- GENERAL NOTES:**
1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
 3. FOR THE FOLLOWING PLUMBING FIXTURE SPECIFICATIONS, SEE PLUMBING FIXTURE SCHEDULE ON SHEET A1.1 WATER CLOSET, LAVATORY, MOP SINK, FLOOR DRAIN, AND FLOOR SINK.

- SANITARY PIPING PLAN NOTES:**
1. CONNECT NEW 4" SANITARY WASTE PIPING TO EXISTING SANITARY LINE. CONTRACTOR TO FIELD VERIFY EXISTING SANITARY LINE SIZE, LOCATION, ROUTING AND INVERT PRIOR TO BID.
 2. GI-1: GREASE INTERCEPTOR SCHIER GB-75 FOR INDOOR INSTALLATION. FLOW RATE - 75GPM. CONTRACTOR TO FIELD VERIFY PLACEMENT OF GREASE INTERCEPTOR. INSTALL GREASE INTERCEPTOR AS PER MANUFACTURER'S RECOMMENDATION.
 3. ROUTE INDIRECT WASTE FROM ICE MACHINE TO FLOOR SINK WITH APPROVED AIR GAP.
 4. ROUTE INDIRECT WASTE FROM OVEN TO FLOOR SINK WITH APPROVED AIR GAP.
 5. ROUTE INDIRECT WASTE FROM 3-COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
 6. CONDENSATE DRAIN FROM WALK-IN COOLER/FREEZER DISCHARGE TO FLOOR DRAIN WITH APPROVED AIR GAP.
 7. ROUTE INDIRECT WASTE FROM ESPRESSO MACHINE TO FLOOR SINK WITH APPROVED AIR GAP.

① FIRST FLOOR SANITARY PIPING PLAN
1/4" = 1'-0"

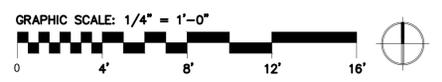


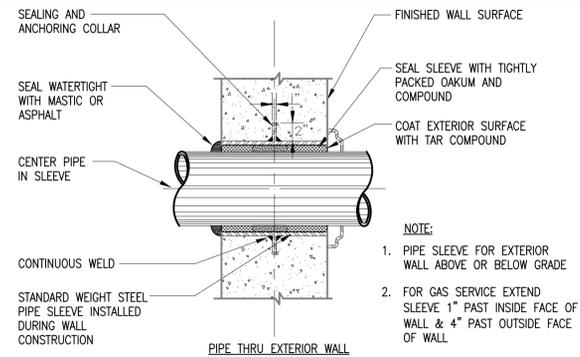


- GENERAL NOTES:**
1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
 3. FOR THE FOLLOWING PLUMBING FIXTURE SPECIFICATIONS, SEE PLUMBING FIXTURE SCHEDULE ON SHEET A1.1 WATER CLOSET, LAVATORY, MOP SINK, FLOOR DRAIN, AND FLOOR SINK.

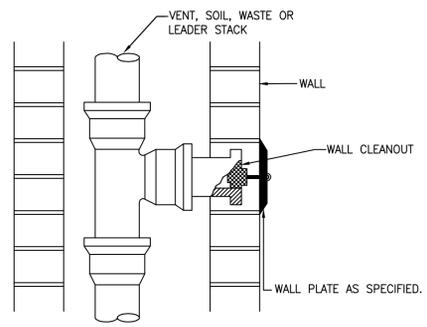
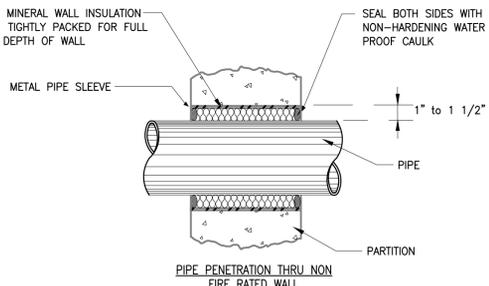
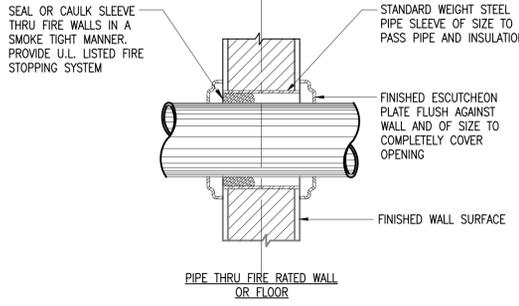
- SANITARY PIPING PLAN NOTES:**
1. ROUTE INDIRECT WASTE FROM 3-COMPARTMENT SINK TO FLOOR SINK WITH APPROVED AIR GAP.
 2. ROUTE INDIRECT WASTE FROM BEER AND WINE DISPENSER TO FLOOR SINK WITH APPROVED AIR GAP.
 3. ROUTE INDIRECT WASTE FROM BEER DISPENSER TO FLOOR SINK WITH APPROVED AIR GAP.
 4. SANITARY PIPING RUNNING AT BELOW FLOOR CEILING.

① ROOF DECK SANITARY PIPING PLAN
 1/4" = 1'-0"



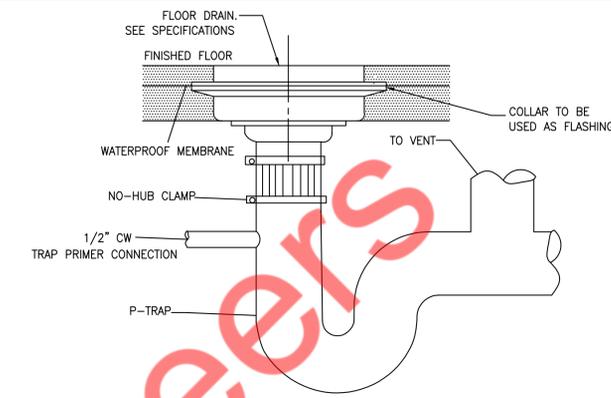


NOTE:
 1. PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE
 2. FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL & 4" PAST OUTSIDE FACE OF WALL

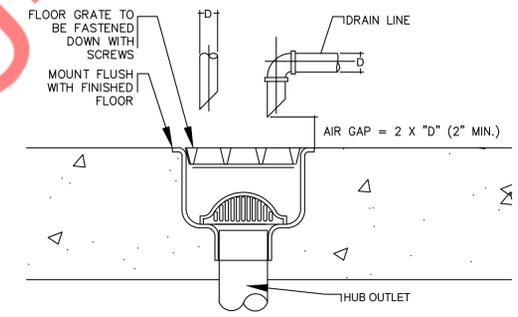


1 PIPE SLEEVE THRU WALL SECTION
 P3.1 N.T.S

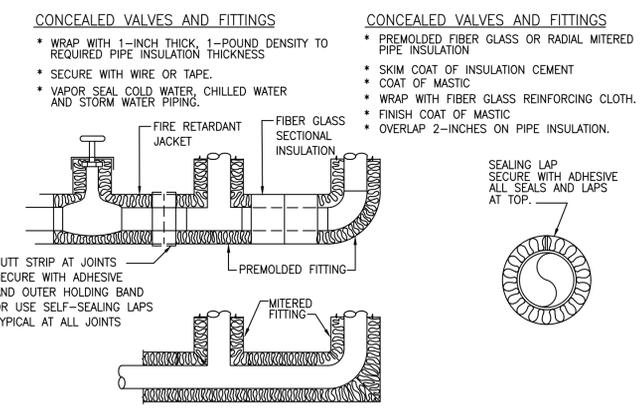
2 WALL CLEANOUT DETAIL
 P3.1 N.T.S



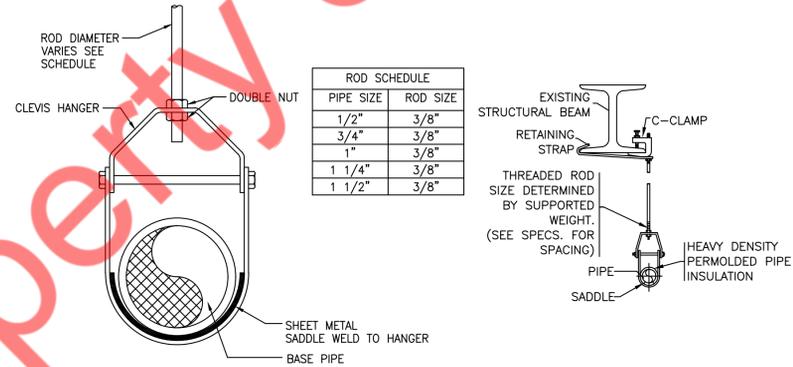
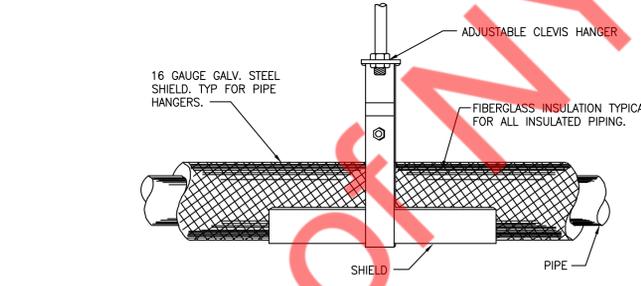
3 FLOOR DRAIN DETAIL
 P3.1 N.T.S



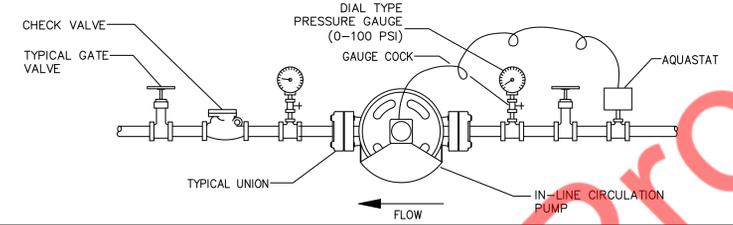
7 FLOOR SINK DETAIL
 P3.1 N.T.S



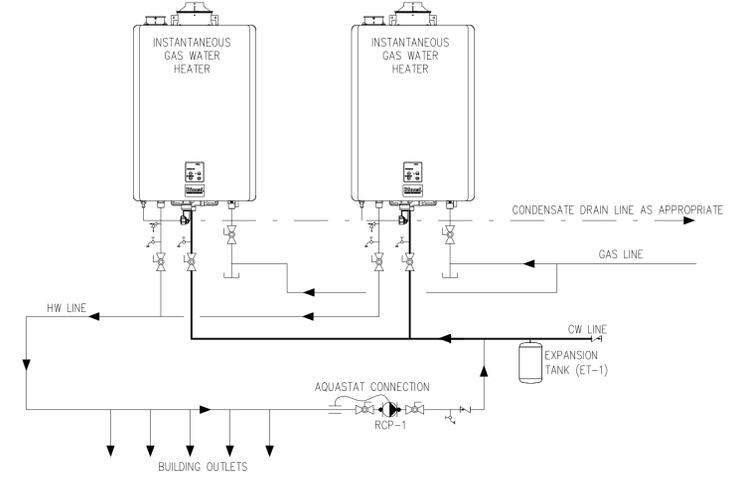
4 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS
 P3.1 N.T.S



6 HANGER DETAIL
 P3.1 N.T.S

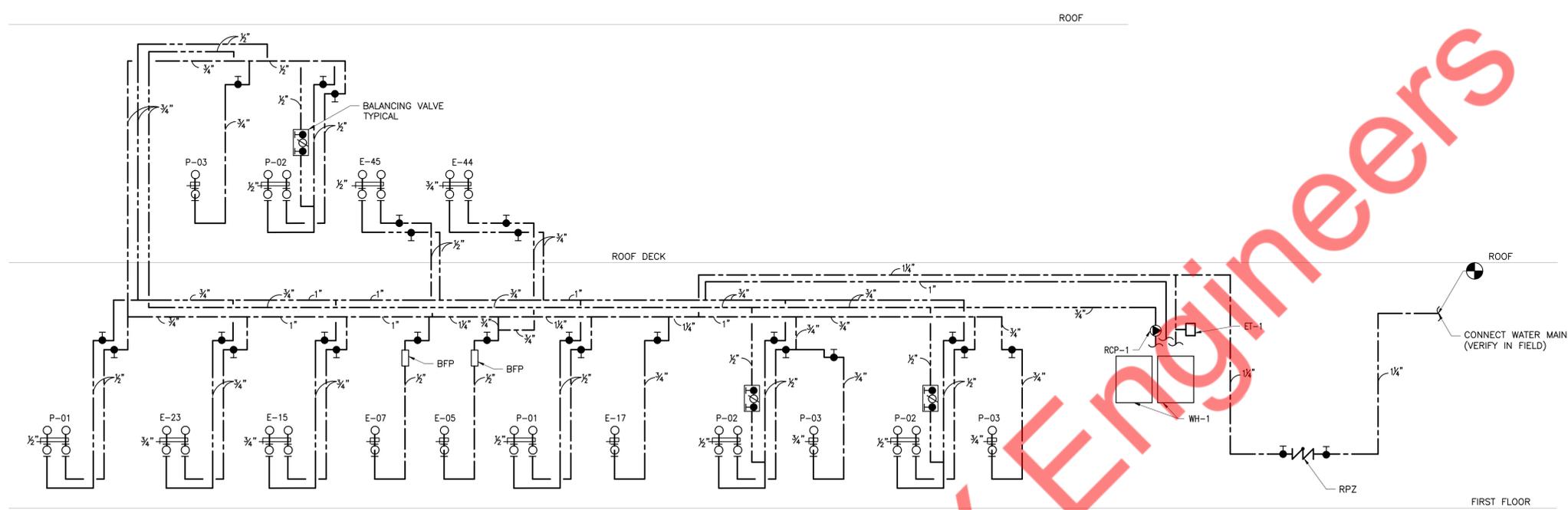


5 INLINE RECIRCULATION PUMP DETAIL
 P3.1 N.T.S

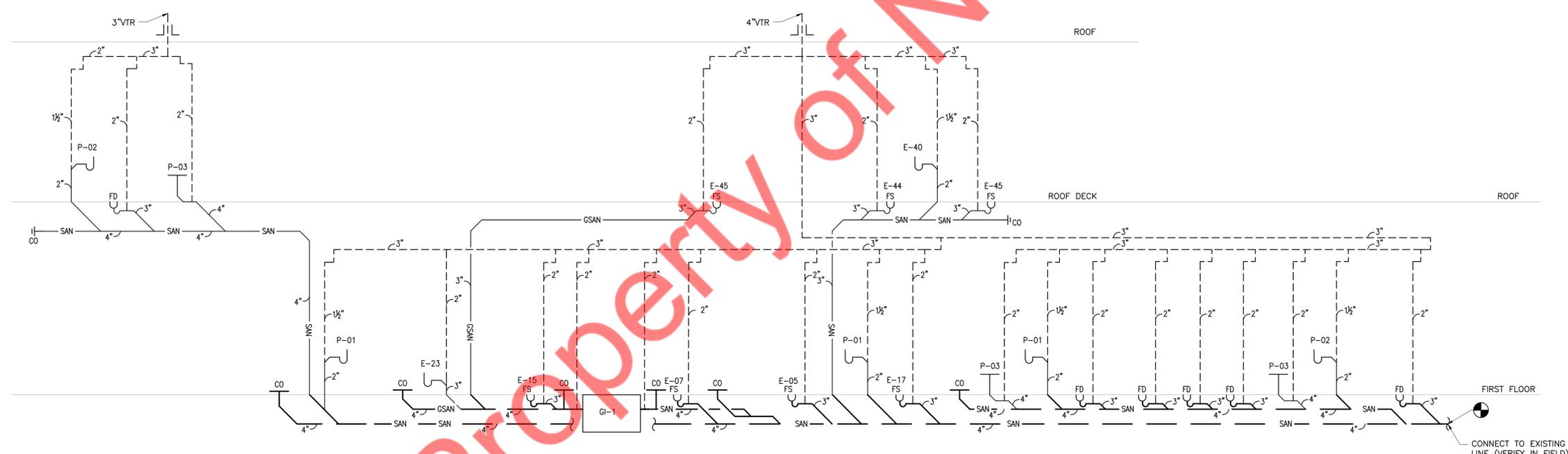


REFER TO SPECIFICATION AND PLUMBING FIXTURE SCHEDULE. PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUITE FIELD CONDITIONS. REFER TO FLOOR PLAN FOR PIPE SIZES.

8 TANKLESS GAS WATER HEATER DETAILS
 P3.1 N.T.S



DOMESTIC WATER SUPPLY RISER DIAGRAM
NOT TO SCALE



SANITARY RISER DIAGRAM
NOT TO SCALE

PLUMBING FIXTURE SCHEDULE								
FIXTURE NO	TYPE	MANUFACTURER	MODEL	SAN		VENT	CW	HW
				DIRECT	INDIRECT			
P-01	HAND SINK	STELLTON	522CS11515	2"	-	2"	1/2"	1/2"
P-02	LAVATORY	AMERICAN STANDARD	9024901EC.020	1-1/2"	-	1-1/2"	1/2"	1/2"
P-03	WATER CLOSET	TOTO	DRAKE TWO PIECE	4"	-	2"	3/4"	-
E05	ESPRESSO CAPPUCCINO MACHINE	RANCILIO/ERGO	EGRO ONE-TOP MILK XP	-	2"	-	1/2"	-
E07	UNDER COUNTER ICE MACHINE	MANITOWOC	UYFD190A.NEO	-	1-1/2"	-	1/2"	-
E15	3-COMP. SINK	ADVANCE TABCO	FC-3-1818-24RL	-	2"	-	3/4"	3/4"
E17	CONVECTION OVEN ELECTRIC	MOFFAT	E32D5	-	2"	-	3/4"	-
E23	MOP SINK	MUSTEE	63M	1-1/2"	-	1-1/2"	1/2"	1/2"
E40	UNDER BAR SINK UNIT	BK RESORCES	BKUBS-1014HS-P-GS	2"	-	1-1/2"	1/2"	1/2"
E42	6 TAP BEER TOWER	GLASTENDER	WT-6-S5	-	1-1/2"	-	-	-
E43	4 TAP WINE TOWER	GLASTENDER	WT-4-S5	-	1-1/2"	-	-	-
E44	UNDER BAR SINK UNITS	BK RESORCES	BKUBS-360TS	-	2"	-	3/4"	3/4"
E45	BEER DISPENSER	TRUE	TDD-1-HC	-	2"	-	-	-
FS	FLOOR SINK	ZURN	Z1900	3"	-	2"	-	-
FD	FLOOR DRAIN	ZURN	ZN415	3", 4"	-	2"	-	-

NOTE: FOR THE FOLLOWING PLUMBING FIXTURE SPECIFICATIONS, SEE PLUMBING FIXTURE SCHEDULE ON SHEET A1.1: WATER CLOSET, LAVATORY, MOP SINK, FLOOR DRAIN, AND FLOOR SINK.

FIXTURE UNIT CALCULATION								
FIXTURE	QTY.	EQUIPMENT CATEGORY	UNITS PER FIXTURE			TOTAL		
			CW	HW	TOTAL	CW	HW	TOTAL
P-03	3	WATER CLOSET (FLUSH TANK)	5	-	5	15	-	15
P-02	3	LAVATORY	1.5	1.5	2	4.5	4.5	6
P-01	2	HAND SINK	0.5	0.5	0.7	1	1	1.4
E-05	1	ESPRESSO CAPPUCCINO MACHINE	0.25	-	0.25	0.25	-	0.25
E-07	1	UNDERCOUNTER ICE MACHINE	0.25	-	0.25	0.25	-	0.25
E-15	1	3-COMP. SINK	3	3	4	3	3	4
E-17	1	CONVECTION OVEN ELECTRIC	0.25	-	0.25	0.25	-	0.25
E-23	1	MOP SINK	2.5	2.5	3	2.5	2.5	3
E40	1	UNDER BAR SINK UNIT	0.5	0.5	0.7	0.5	0.5	0.7
E44	1	UNDER BAR SINK UNITS	3	3	4	3	3	4
TOTAL FIXTURE UNITS						30.25	14.5	34.85
TOTAL FIXTURE UNITS-34.85=24.9GPM								

WSFU VALUES AS PER NORTH CAROLINA STATE PLUMBING CODE 2018 TABLE E103.2(2)
PER NORTH CAROLINA STATE PLUMBING CODE 2018 TABLE E103.3(3) FOR 24.9GPM CALCULATED PIPE SIZE IS 1-1/4"

RECIRCULATING PUMP SCHEDULE					
ITEM	QUANTITY	GPM	TOTAL HEAD (FT)	MOTOR HP	MANUFACTURER & MODEL NO
RCP-1	1	2	10	0.115	GRUNDFOS UP 15-18

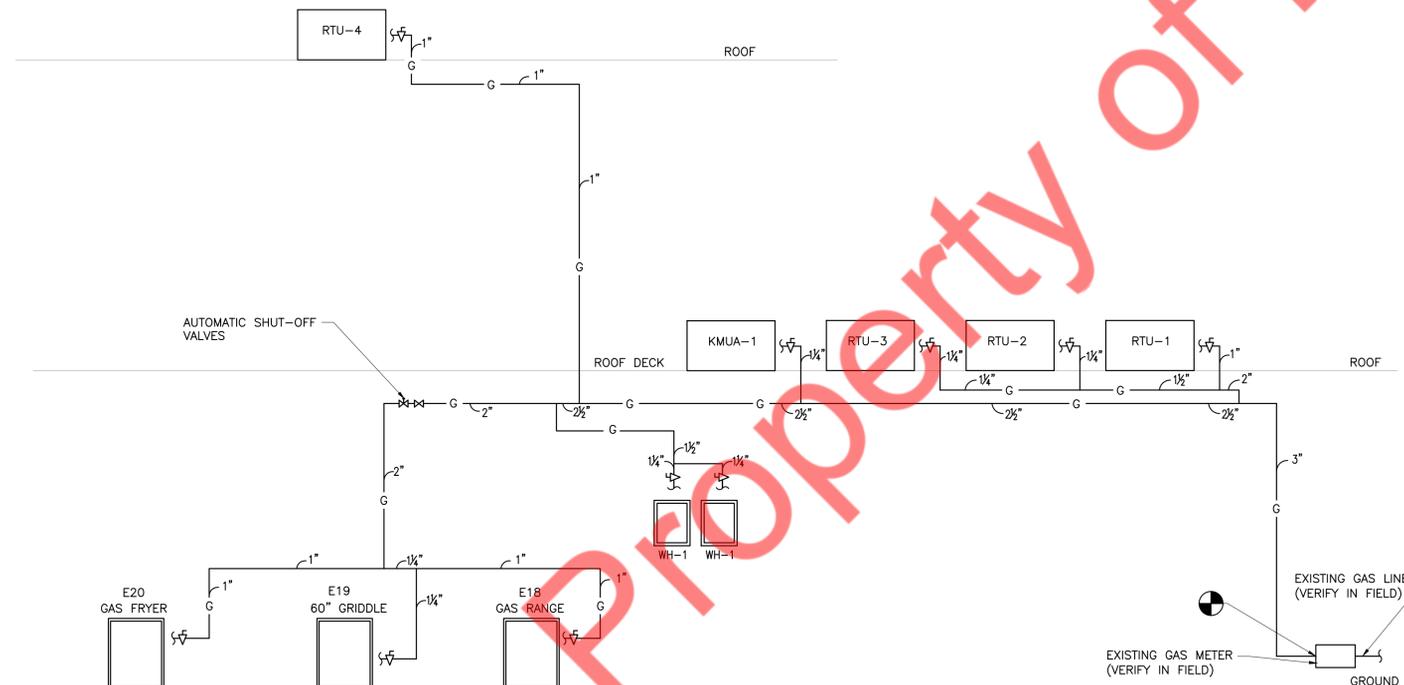
EXPANSION TANK SCHEDULE							
TAG	LOCATION	SERVICE	CAPACITY (GALLONS)	MANUFACTURER & MODEL	DIMENSION (DIA X HEIGHT)	WEIGHT (LBS)	NO. OF EXPANSION TANK
ET-1	REFER FLOOR PLANS	HW	2	THERM-X-TROL ST-5	8" X 13"	5	1

TANKLESS WATER HEATER SCHEDULE								
HEATER TAG	QUANTITY	LOCATION	ELECTRICAL CHARACTERISTICS	TYPE	GAS CONSUMPTION (BTU/HR)	FLOW RATE (GPM)@80°F	MANUFACTURER/ MODEL	WEIGHT (LBS)
WH-1	2	DRY STORAGE	120V/60	GAS	199,000	4.3	RINNAI/CU199I	64

GREASE INTERCEPTOR SIZING CALCULATION										
FIXTURE	QUANTITY	DIMENSIONS			VOLUME		PERCENTAGE USAGE (%)	ACTUAL USAGE (GALLONS)	FLOW RATE (GPM)	
		LENGTH (IN)	WIDTH (IN)	DEPTH (IN)	CUBIC INCHES	GALLONS			1 MIN.	2 MIN.
3-COMP. SINK	1	18	18	14	13608	58.9	0.75	44.2	44.2	22.1
MOP SINK	1	24	24	10	5760	24.9	0.75	18.7	18.7	9.4
UNDER BAR SINK UNITS	1	10	14	10	4200	18.2	0.75	13.7	13.7	6.9
TOTAL GPM:								76.6	38.4	

GREASE INTERCEPTOR SCHEDULE					
ITEM	SERVICE	FLOW CAPACITY (GPM)	GREASE CAPACITY (LBS)	LIQUID CAPACITY (GALLON)	MANUFACTURER AND MODEL
GREASE INTERCEPTOR GB-75	KITCHEN WASTE	75	861	125	SCHIER MODEL GB-75

NOTE: CONTRACTOR TO PROVIDE ALL REQUIRED ACCESSORIES FOR SATISFACTORY WORKING OF GREASE TRAP AS PER SITE CONDITIONS.



GAS RISER DIAGRAM
NOT TO SCALE

GAS PIPE SIZING PER TABLE 402.4(2), NORTH CAROLINA FUEL GAS CODE 2018. GAS INLET PRESSURE- LESS THAN 2 PSI. PRESSURE DROP- 0.5" WC
TOTAL EQUIVALENT LENGTH OF PIPE = 188 FEET

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

GAS LOAD SUMMARY						
ITEM NO.	QTY.	DESCRIPTION	MANUFACTURER	MODEL	SIZE	BTU/HR.
WH-1	2	WATER HEATER	RINNAI	CU199I	1 1/2"	398,000
E18	1	GAS RANGE	WINCO	NGHP-4	1"	100,000
E19	1	60" GRIDDLE	VULCAN	VCCG60-AS	1 1/2"	150,000
E20	1	FRYER	PITCO	2-SF-SG14R-C	1"	122,000
RTU-1	1	ROOF TOP UNIT	CARRIER	48FCEB04	1"	110,000
RTU-2	1	ROOF TOP UNIT	CARRIER	48FCM08	1 1/4"	180,000
RTU-3	1	ROOF TOP UNIT	CARRIER	48FCM08	1 1/4"	180,000
RTU-4	1	ROOF TOP UNIT	CARRIER	48FCEB04	1"	110,000
KMUA-1	1	KITCHEN MAKEUP AIR UNIT	-	-	1 1/4"	196,116
TOTAL LOAD						1546,116