MECHANICAL SYMBOLS LIST

Symbol	Description
AC-1 / TXF-1	EQUIPMENT SYMBOL

AIR DEVICES

Symbol	Description
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN
	CEILING DIFFUSER EXHAUST

DUCT ACCESSORIES

Symbol	Description
VD VD	VOLUME DAMPER W/ ACCESS DOOR
	FIRE DAMPER W/ ACCESS DOOR
BD	BACKDRAFT DAMPER

CONTROLS AND SENSORS

Symbol	Description
T	THERMOSTAT
SD	DUCT SMOKE DETECTOR
S	EMERGENCY MANUAL ACTIVATION DEVICE FOR HOOD

DUCTWORK

Symbol	Description
	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE DUCT
FC FC	FLEXIBLE CONNECTION
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
Ø12	ROUND DUCT (DIAMETER)
	ROUND DUCT CROSS SECTION
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
	RETURN AIR RECTANGULAR DUCT CROSS SECTION

MECHANICAL ABBREVIATIONS

AL	ACOUSTIC LINING
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
DN	DOWN
DOAS	DEDICATED OUTDOOR AIR SYSTEM
EX	EXHAUST
EF	EXHAUST FAN
EG	EXHAUST GRILLE
FC	FLEXIBLE CONNECTION
FD/AD	FIRE DAMPER W/ACCESS DOOR
KEF	KITCHEN EXHAUST FAN
MD	MOTORIZED DAMPER
MAU	MAKE-UP AIR UNIT
OA	OUTSIDE AIR
RTU	ROOF TOP UNIT
RG	RETURN GRILLE
RA	RETURN AIR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SG	SUPPLY GRILLE
SA	SUPPLY AIR
VD	VOLUME DAMPER
WT	WEIGHT
WMS	WIRE MESH SCREEN

MECHANICAL DRAWING LIST

M001	MECHANICAL NOTES & SYMBOLS LIST
M002	MECHANICAL SPECIFICATIONS
M101	MECHANICAL FLOOR PLAN
M102	MECHANICAL ROOF PLAN
M501	MECHANICAL DETAILS (01 OF 03)
M502	MECHANICAL DETAILS (02 OF 03)
M503	MECHANICAL DETAILS (03 OF 03)
M504	HOOD DETAILS (01 OF 04)
M505	HOOD DETAILS (02 OF 04)
M506	HOOD DETAILS (03 OF 04)
M507	HOOD DETAILS (04 OF 04)
M601	MECHANICAL SCHEDULES
M701	ENERGY COMPLIANCE (01 OF 02)
M702	ENERGY COMPLIANCE (02 OF 02)

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ENERGY CONSERVATION CODE 2024 COMPLIANCE

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE INTERNATIONAL ENERGY CONSERVATION CODE 2024.

APPLICABLE CODES

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INTERNATIONAL BUILDING CODE 2024
INTERNATIONAL FIRE CODE 2014
UNIFORM MECHANICAL CODE 2024
UNIFORM PLUMBING CODE 2024
INTERNATIONAL ENERGY CONSERVATION CODE 2024
INTERNATIONAL WILDLAND-URBAN INTERFACE CODE 2024, WUI PROXIMITY ZONE C
NATIONAL ELECTRIC CODE 2023 (NEC 2023)

BUILDING DEPARTMENT NOTES

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

1. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
2. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 2024 UMC:

   A. VENTILATION SYSTEM SERVING COMMERCIAL COOKING APPLIANCES - MC 506
3. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:

   A. DUCT CONSTRUCTION AND INSTALLATION- 2024 UMC 603
   B. AIR INTAKES, EXHAUSTS AND RELIEF - 2024 UMC CHAPTER 4
   C. AIR FILTERS - 2024 UMC 311.2
4. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
5. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2024 UMC 401
6. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2024 UMC 403.3
7. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
8. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
9. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
10. SMOKE DETECTOR SHALL MEET UL268A.
11. VENTILATION SYSTEMS SHALL BE BALANCED TO MAINTAIN THE MINIMUM VENTILATION AIRFLOW RATE AS SHOWN IN VENTILATION REQUIREMENT TABLE. THIS SYSTEM SHALL BE BALANCED BY APPROVED METHOD - UMC 2024 403. CONTRACTOR SHALL SUBMIT THE AIR BALANCE REPORT TO THE INSPECTOR.
12. INDOOR DUCT AND PLENUM INSULATION SCHEDULE; (SECTION 230713)

    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

GENERAL NOTES

1. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
2. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
3. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
5. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
6. CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
7. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
8. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
9. 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.
10. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.
11. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
12. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
13. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
14. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
15. ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.
16. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
17. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
18. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
19. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
20. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
21. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
24. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
25. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
26. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
27. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
28. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
29. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
30. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.
31. CONTRACTOR TO UTILIZE EXISTING WARRANTY ROOFING CONTRACTOR FOR ANY AND ALL ROOF PENETRATIONS ON THIS PROJECT. THIS CONTRACTOR WILL BE RESPONSIBLE FOR ROOF IF THE EXISTING ROOFING WARRANTY IS VOIDED.

DEFINITION:

1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

SCOPE OF WORK

SCOPE OF WORK

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
2. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
3. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

GENERAL HVAC NOTES

1. PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
4. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.
7. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
8. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.
10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
11. LOCATE ALL TEMPERATURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
12. WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.
13. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
14. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.
15. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.
16. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
17. ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
18. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
19. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
20. ALL CONDENSATE DRAIN LINES FROM EACH ROOF TOP UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.
21. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
22. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
23. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.

HVAC DUCTWORK - SHEET METAL

1. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK,ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.
2. CONTRACTOR TO CHECK AND CORRECT ANY AND ALL DEFICIENCIES IN EXISTING DUCTS. ALL NEW DUCTWORK WILL COMPLY WITH THE LATEST SMACNA GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST HANDBOOKS PUBLISHED BY ASHRAE.
3. PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.
4. SUPPLY AND RETURN DUCTWORK 10' FROM ALL HVAC UNITS SHALL BE LINED WITH 1.5" ACOUSTICAL LINING.
5. RE-INSULATE ALL DUCTWORK AND PIPING IN WHICH INSULATION HAS BEEN REMOVED OR DAMAGED WITH INSULATION EQUAL TO THE EXISTING INSULATION.
6. CONTRACTOR SHALL SUPPLY AND INSTALL ALL NECESSARY SUPPLY DIFFUSERS AND RETURN AIR REGISTERS WHERE INDICATED ON THE DRAWING. COORDINATE LOCATION OF DIFFUSERS AND REGISTERS WITH REFLECTED CEILING PLAN.
7. IN CORRIDORS WHERE CEILING SPEAKERS AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE FIXTURES.
8. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'-0" (CENTER LINE) ABOVE THE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
9. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
10. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.
11. PROVIDE ALL 90-DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN DISHWASHER, KITCHEN, AND LAUNDRY EXHAUSTS SHALL BE OF UN-VANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1-1/2 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.
12. COORDINATE DIFFUSER, REGISTER, AND GRILL LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
13. ALL AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.
14. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.
15. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS, AND OTHER EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.
16. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.
17. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.
18. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
19. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.
20. PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.
21. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
22. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.
23. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

SECTION 0101 - QUALITY OF WORK

1.1 WORKMANSHIP

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

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

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

1.2 CODE COMPLIANCE

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

END OF SECTION 0101

SECTION 0102 -REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS

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

1.2 SUBMITTALS

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

1.3 RECORD DRAWINGS

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

1.4 EQUIPMENT OPERATING INSTRUCTIONS

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

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

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

END OF SECTION 0102

SECTION 078413-PENETRATION FIRE-STOPPING

1.1 QUALITY ASSURANCE

A. INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.

B. FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL

1.2 PENETRATION FIRESTOPPING

A. PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.

B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479:

C. PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.

D. W-RATINGS: PER UL 1479.

1.3 INSTALLATION

A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.

1.4 FIELD QUALITY CONTROL

A. INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.

1.5 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

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

FOR THE FOLLOWING SYSTEMS:

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

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

1.6 MANUFACTURERS

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

END OF SECTION 078413

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FLAME BROILER

MECHANICAL NOTES & SYMBOL LIST

M001

SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 COMPONENTS

A. VIBRATION ISOLATORS:

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

B. AIR-MOUNTING SYSTEMS:

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

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

D. VIBRATION ISOLATION EQUIPMENT BASES:

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

1.2 FIELD QUALITY CONTROL

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

PART-2 PRODUCTS

1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES

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

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

1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. HILTI, INC.
5. ISOLATION TECHNOLOGY, INC.
6. KINETICS NOISE CONTROL.
7. LOOS & CO.; CABLEWARE DIVISION.
8. MASON INDUSTRIES.
9. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
10. UNISTRUT; TYCO INTERNATIONAL, LTD.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

1. AIR SYSTEMS: CONSTANT AND VARIABLE VOLUME SYSTEMS.
2. MOTORS.

1.2 QUALITY ASSURANCE

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

1.3 EXECUTION

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

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

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

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

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

F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS S3ECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.

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

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

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

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

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

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

1.2 FIELD QUALITY CONTROL

A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE;

A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:

B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

UNCONDITIONED SPACES WITHIN BUILDING:	R-6
WITHIN BUILDING ENVELOPE ASSEMBLY:	R-8
OUTSIDE OF BUILDING:	R-8

1.4 ITEMS NOT INSULATED:

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

1.5 PRODUCTS

A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

1. JOHNS-MANVILLE
2. OWENS-CORNING

1.6 ACOUSTICAL TREATMENT

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

END OF SECTION 230713

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION

A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".

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

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

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

USG	MAX. SIDE INCHES BRACING	TRANSVERSE JOINTS AND
22	UP TO 12	S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
22	13 TO 24	1"X1"X1/8" ANGLES ON 4 FOOT CENTERS
20	25 TO 35	1"X1"X1/8" ANGLES ON 2 FOOT CENTERS

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

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

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

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

1.2 MATERIALS

A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.

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

C. SHEET METAL MATERIALS:

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

D. DUCT LINER:

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

E. SEALANT MATERIALS:

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

1.3 DUCT CLEANING

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

B. CLEAN THE FOLLOWING ITEMS:

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

1.4 DUCT SCHEDULE

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

1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

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

B. MANUFACTURERS: METALAIRE

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

a. CARNES.
b. HART & COOLEY INC.
c. KRUEGER.
d. TITUS, INC.
e. NAILOR INDUSTRIES INC.
f. RUSKIN

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

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

END OF SECTION 233713

C403.4.1 THERMOSTATIC CONTROLS

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

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

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

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

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

C403.4.1.3 SETPOINT OVERLAP RESTRICTION
WHERE THERMOSTATIC CONTROL SETPOINTS ARE CAPABLE OF BEING ADJUSTED BY OCCUPANTS OR HVAC SYSTEM OPERATORS, THE ADJUSTMENT SHALL BE INDEPENDENT FOR THE HEATING SETPOINT AND THE COOLING SETPOINT; WHEN ONE SETPOINT IS CHANGED, THE OTHER SHALL NOT CHANGE EXCEPT AS NEEDED TO MAINTAIN THE MINIMUM DEADBAND REQUIRED BY SECTION C403.4.1.2. FOR THERMOSTATIC CONTROLS THAT DISPLAY SETPOINTS, BOTH THE HEATING AND CCOOLING SETPOINTS SHALL BE DISPLAYED SIMULTANEOUSLY, OR THE SETPOINT OF THE CURRENTLY ACTIVE MODE (HEATING OR COOLING) SHALL BE DISPLAYED ALONG WITH AN INDICATION OF THAT MODE.

C403.4.2 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 MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.

C403.4.2.1 THERMOSTATIC SETBACK
THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN
AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

C403.4.2.3 AUTOMATIC START AND STOP

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

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

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System Cooling Checksums

RTU-1 _RTU_1

Coil Peak — Peak Time (Mo/D/H:M): 9/21/11:00; Outside Air (DB/WB/HR): 91.5 / 74.2 / 0.0
Fan Peak — Peak Time (Mo/D/H:M): 9/21/11:00; Outside Air (DB/WB/HR): 91.5 / 74.2 / 0.0

	Coil Peak Instant Sensible (Btu/h)	Coil Peak Time Delay Sensible (Btu/h)	Coil Peak Latent (Btu/h)	Coil Peak Total (Btu/h)	Coil Peak Percent of Total (%)	Coil Peak Btu/h per ft^2	Fan Peak Instant Sensible (Btu/h)	Fan Peak Time Delay Sensible (Btu/h)	Fan Peak Total Sensible (Btu/h)	Fan Peak Percent of Total (%)	Fan Peak Related Area (ft^2)
Roof	0	1,086	0	1,086	1.8	1.7	0	1,086	1,086	3.9	645
Other Roof	0	0	0	0	0.0	0.0	0	0	0	0.0	645
Glass	7,668	6,108	0	13,777	23.2	63.1	7,668	6,108	13,777	49.9	218
Door	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Wall	0	-134	0	-134	-0.2	-0.3	0	-134	-134	-0.5	429
Delow-Grade Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Other Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	429
Partition	0	-1,515	0	-1,515	-2.6	-0.5	0	-1,515	-1,515	-5.5	2,837
Exterior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Interior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Slab	0	-419	0	-419	-0.7	-0.7	0	-419	-419	-1.5	645
Other Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Infiltration	945	0	1,364	2,309	3.9	5.4	945	0	945	3.4	429
Envelope Subtotal	8,613	5,127	1,364	15,104	25.4	-	8,613	5,127	13,739	49.8	-
People	3,150	3,757	6,000	12,906	21.7	21.6	3,150	3,757	6,906	25.0	599
Lights	773	1,032	0	1,805	3.0	4.5	773	1,032	1,805	6.5	599
RA Sensible (Lights)	444	0	0	444	0.7	0.0	-	-	-	-	-
Miscellaneous Loads	1,330	766	0	2,095	3.5	3.5	1,330	766	2,095	7.6	599
Internal Subtotal	5,696	5,555	6,000	17,251	29.1	-	5,252	5,555	10,807	39.1	-
Ventilation	11,821	0	10,612	22,433	37.8	-	-	-	-	-	-
DOAS Direct to Zone	0	0	0	0	0.0	-			0	0.0	0
Ceiling	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Refrigeration	0	0	0	0	0.0	0.0			0	0.0	599
Service Water	0	0	0	0	0.0	0.0			0	0.0	599
HVAC Equipment Losses	0	0	0	0	0.0	0.0			0	0.0	0
Adj Air Transfer Heat	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Supply Fan Heat	1,484	0	-	1,484	2.5	-	-	-	-	-	-
Time Delay Correction	0	-555	-	-555	-0.9	-	0	-555	-555	-2.0	-
Sizing Factor Correction	3,599	-	-	3,599	6.1	-	3,599	-	3,599	13.0	-
Over/Undersizing	21	0	25	46	0.1	-	21	-	21	0.1	-
Grand Total	31,234	10,127	18,000	59,361	100.0		17,485	10,127	27,611	100.0	

Temperatures

Airflows cfm	
Main Fan	1,073
Ventilation	500
Infiltration	53
Min Stop / Reheat	1,073

Engineering Checks	
% OA	53.63
cfm/ft^2	1.56
Btu/h-ft^2	99.15
cfm/ton	188.52
ft^2/ton	121.11
People	30
ft^2/person	19.97

Areas ft^2	
Roof	645
Other Roof	645
Ceiling	0
Window	218
Door	0
Wall	429
Below-Grade Wall	0
Other Wall	429
Partition	2,837
Exterior Floor	0
Internal Floor	0
Slab	645
Other Floor	0

System Heating Checksums

RTU-1 _RTU_1

Coil Peak — Peak Time (Mo/D/H:M): 1/21/06:00; Outside Air (DB/WB/HR): 27.1 / 21.0 / 0.0
Fan Peak — Peak Time (Mo/D/H:M): 9/21/11:00; Outside Air (DB/WB/HR): 91.5 / 74.2 / 0.0

	Coil Peak Instant Sensible (Btu/h)	Coil Peak Time Delay Sensible (Btu/h)	Coil Peak Latent (Btu/h)	Coil Peak Total (Btu/h)	Coil Peak Percent of Total (%)	Coil Peak Btu/h per ft^2	Fan Peak Instant Sensible (Btu/h)	Fan Peak Time Delay Sensible (Btu/h)	Fan Peak Total Sensible (Btu/h)	Fan Peak Percent of Total (%)	Fan Peak Related Area (ft^2)
Roof	0	-948	0	-948	2.6	-1.5	0	1,086	1,086	3.9	645
Other Roof	0	0	0	0	0.0	0.0	0	0	0	0.0	645
Glass	-5,458	0	0	-5,458	15.1	-25.0	7,668	6,108	13,777	49.9	218
Door	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Wall	0	-1,275	0	-1,275	3.5	-3.0	0	-134	-134	-0.5	429
Delow-Grade Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Other Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	429
Partition	0	50	0	50	-0.1	0.0	0	-1,515	-1,515	-5.5	2,837
Exterior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Interior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Slab	0	243	0	243	-0.7	0.4	0	-419	-419	-1.5	645
Other Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Infiltration	-5,186	0	0	-5,186	14.4	-12.5	945	0	945	3.4	429
Envelope Subtotal	-10,644	-1,931	0	-12,574	34.8	-	8,613	5,127	13,739	49.8	-
People	0	0	0	0	0.0	0.0	3,150	3,757	6,906	25.0	599
Lights	0	0	0	0	0.0	0.0	773	1,032	1,805	6.5	599
RA Sensible (Lights)	0	0	0	0	0.0	0.0	-	-	-	-	-
Miscellaneous Loads	0	0	0	0	0.0	0.0	1,330	766	2,095	7.6	599
Internal Subtotal	0	0	0	0	0.0	-	5,252	5,555	10,807	39.1	-
Ventilation	-22,692	0	0	-22,692	62.8	-	-	-	-	-	-
DOAS Direct to Zone	0	0	0	0	0.0	-			0	0.0	0
Ceiling	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Refrigeration	0	0	0	0	0.0	0.0			0	0.0	599
Service Water	0	0	0	0	0.0	0.0			0	0.0	599
HVAC Equipment Losses	0	0	0	0	0.0	0.0			0	0.0	0
Adj Air Transfer Heat	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Supply Fan Heat	0	0	0	0	0.0	-	-	-	-	-	-
Time Delay Correction	0	-223	0	-223	0.6	-	0	-555	-555	-2.0	-
Sizing Factor Correction	-640	-	0	-640	1.8	-	3,599	-	3,599	13.0	-
Over/Undersizing	3	0	0	3	0.0	-	21	-	21	0.1	-
Grand Total	-33,973	-2,153	0	-36,126	100.0		17,485	10,127	27,611	100.0	

Temperatures

Airflows cfm	
Main Fan	1,073
Ventilation	500
Infiltration	114
Min Stop / Reheat	1,073

Engineering Checks	
% OA	48.94
cfm/ft^2	1.71
Btu/h-ft^2	-60.34
cfm/ton	-339.40
ft^2/ton	-199.00
People	30
ft^2/person	19.97

Areas ft^2	
Roof	645
Other Roof	645
Ceiling	0
Window	218
Door	0
Wall	429
Below-Grade Wall	0
Other Wall	429
Partition	2,837
Exterior Floor	0
Internal Floor	0
Slab	645
Other Floor	0

DOAS-1 _DOAS_1

Coil Peak — Peak Time (Mo/D/H:M): 9/21/14:00; Outside Air (DB/WB/HR): 96.5 / 75.5 / 0.0
Fan Peak — Peak Time (Mo/D/H:M): 7/21/15:00; Outside Air (DB/WB/HR): 99.7 / 74.9 / 0.0

	Coil Peak Instant Sensible (Btu/h)	Coil Peak Time Delay Sensible (Btu/h)	Coil Peak Latent (Btu/h)	Coil Peak Total (Btu/h)	Coil Peak Percent of Total (%)	Coil Peak Btu/h per ft^2	Fan Peak Instant Sensible (Btu/h)	Fan Peak Time Delay Sensible (Btu/h)	Fan Peak Total Sensible (Btu/h)	Fan Peak Percent of Total (%)	Fan Peak Related Area (ft^2)
Roof	0	2,001	0	2,001	1.0	2.7	0	2,334	2,334	3.8	749
Other Roof	0	0	0	0	0.0	0.0	0	0	0	0.0	749
Glass	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Door	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Below-Grade Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Other Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Partition	0	2,342	0	2,342	1.2	0.6	0	2,393	2,393	3.9	3,728
Exterior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Interior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Slab	0	-12	0	-12	0.0	0.0	0	-11	-11	0.0	749
Other Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Infiltration	1,343	0	1,906	3,248	1.7	0.0	1,533	0	1,533	2.5	0
Envelope Subtotal	1,343	4,331	1,906	7,579	3.9	-	1,533	4,716	6,249	10.2	-
People	1,665	2,032	3,200	6,897	3.6	9.9	1,665	2,034	3,699	6.1	696
Lights	898	1,216	0	2,114	1.1	4.5	898	1,217	2,116	3.5	696
RA Sensible (Lights)	1	0	0	1	0.0	0.0	-	-	-	-	-
Miscellaneous Loads	41,143	166	110	41,419	21.4	59.5	41,143	166	41,309	67.7	696
Internal Subtotal	43,707	3,414	3,310	50,431	26.0	-	43,706	3,418	47,124	77.2	-
Ventilation	59,722	0	63,929	1,23,651	63.8	-	-	-	-	-	-
DOAS Direct to Zone	0	0	0	0	0.0	-			0	0.0	0
Ceiling	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Refrigeration	0	0	0	0	0.0	0.0			0	0.0	696
Service Water	0	0	0	0	0.0	0.0			0	0.0	696
HVAC Equipment Losses	0	0	0	0	0.0	0.0			0	0.0	0
Adj Air Transfer Heat	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Supply Fan Heat	3,085	0	-	3,085	1.6	-	-	-	-	-	-
Time Delay Correction	0	-67	-	-67	0.0	-	0	-66	-66	-0.1	-
Sizing Factor Correction	7,909	-	-	7,909	4.1	-	7,996	-	7,996	13.1	-
Over/Undersizing	397	0	864	1,262	0.7	-	-271	-	-271	-0.4	-
Grand Total	1,16,163	7,677	70,009	1,93,849	100.0		52,964	8,068	61,032	100.0	

Temperatures

Airflows cfm	
Main Fan	2,230
Ventilation	2,230
Infiltration	58
Min Stop / Reheat	2,230

Engineering Checks	
% OA	114.53
cfm/ft^2	2.80
Btu/h-ft^2	278.56
cfm/ton	120.55
ft^2/ton	43.11
People	16
ft^2/person	43.52

Areas ft^2	
Roof	749
Other Roof	749
Ceiling	0
Window	0
Door	0
Wall	0
Below-Grade Wall	0
Other Wall	0
Partition	3,728
Exterior Floor	0
Internal Floor	0
Slab	749
Other Floor	0

DOAS-1 _DOAS_1

Coil Peak — Peak Time (Mo/D/H:M): 1/21/01:00; Outside Air (DB/WB/HR): 27.1 / 21.0 / 0.0
Fan Peak — Peak Time (Mo/D/H:M): 7/21/15:00; Outside Air (DB/WB/HR): 99.7 / 74.9 / 0.0

	Coil Peak Instant Sensible (Btu/h)	Coil Peak Time Delay Sensible (Btu/h)	Coil Peak Latent (Btu/h)	Coil Peak Total (Btu/h)	Coil Peak Percent of Total (%)	Coil Peak Btu/h per ft^2	Fan Peak Instant Sensible (Btu/h)	Fan Peak Time Delay Sensible (Btu/h)	Fan Peak Total Sensible (Btu/h)	Fan Peak Percent of Total (%)	Fan Peak Related Area (ft^2)
Roof	0	-1,155	0	-1,155	1.0	-1.5	0	2,334	2,334	3.8	749
Other Roof	0	0	0	0	0.0	0.0	0	0	0	0.0	749
Glass	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Door	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Below-Grade Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Other Wall	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Partition	0	-1,630	0	-1,630	1.4	-0.4	0	2,393	2,393	3.9	3,728
Exterior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Interior Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Slab	0	159	0	159	-0.1	0.2	0	-11	-11	0.0	749
Other Floor	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Infiltration	-6,028	0	0	-6,028	5.3	0.0	1,533	0	1,533	2.5	0
Envelope Subtotal	-6,028	-2,626	0	-8,654	7.7	-	1,533	4,716	6,249	10.2	-
People	0	0	0	0	0.0	0.0	1,665	2,034	3,699	6.1	696
Lights	0	0	0	0	0.0	0.0	898	1,217	2,116	3.5	696
RA Sensible (Lights)	0	0	0	0	0.0	0.0	-	-	-	-	-
Miscellaneous Loads	0	0	0	0	0.0	0.0	41,143	166	41,309	67.7	696
Internal Subtotal	0	0	0	0	0.0	-	43,706	3,418	47,124	77.2	-
Ventilation	-1,01,173	0	0	-1,01,173	89.6	-	-	-	-	-	-
DOAS Direct to Zone	0	0	0	0	0.0	-			0	0.0	0
Ceiling	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Refrigeration	0	0	0	0	0.0	0.0			0	0.0	696
Service Water	0	0	0	0	0.0	0.0			0	0.0	696
HVAC Equipment Losses	0	0	0	0	0.0	0.0			0	0.0	0
Adj Air Transfer Heat	0	0	0	0	0.0	0.0	0	0	0	0.0	0
Supply Fan Heat	0	0	0	0	0.0	-	-	-	-	-	-
Time Delay Correction	0	-3	0	-3	0.0	-	0	-66	-66	-0.1	-
Sizing Factor Correction	-433	-	0	-433	0.4	-	7,996	-	7,996	13.1	-
Over/Undersizing	-2,709	0	0	-2,709	2.4	-	-271	-	-271	-0.4	-
Grand Total	-1,10,342	-2,629	0	-1,12,971	100.0		52,964	8,068	61,032	100.0	

Temperatures

Airflows cfm	
Main Fan	2,230
Ventilation	2,230
Infiltration	133
Min Stop / Reheat	2,230

Engineering Checks	
% OA	136.28
cfm/ft^2	2.35
Btu/h-ft^2	-162.34
cfm/ton	-173.84
ft^2/ton	-73.97
People	16
ft^2/person	43.52

Areas ft^2	
Roof	749
Other Roof	749
Ceiling	0
Window	0
Door	0
Wall	0
Below-Grade Wall	0
Other Wall	0
Partition	3,728
Exterior Floor	0
Internal Floor	0
Slab	749
Other Floor	0

FLAME BROILER

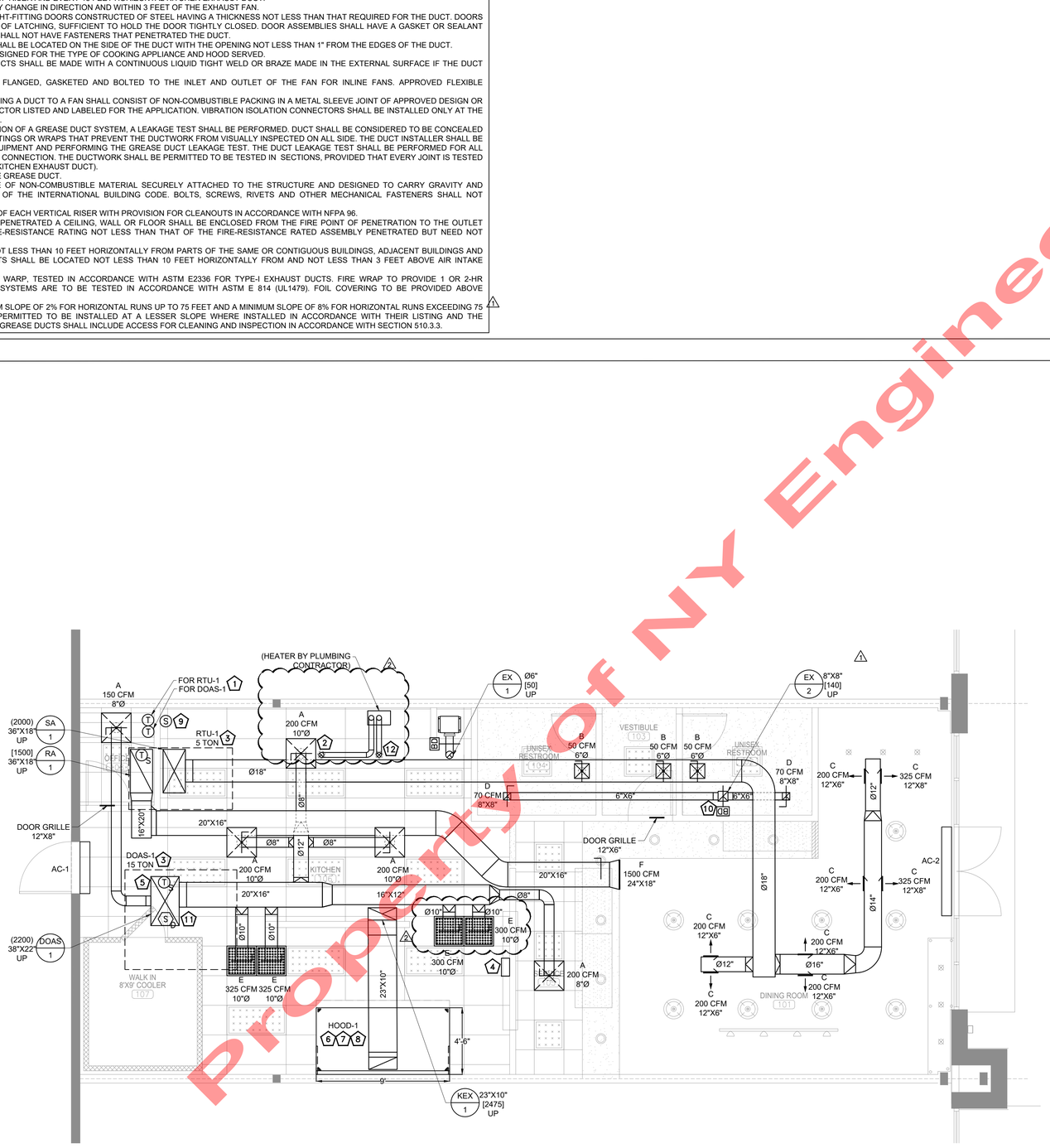
MECHANICAL SPECIFICATIONS

M002

COMMERCIAL KITCHEN NOTES

1. PROVIDE CLEAN OUT AT ALL ELBOWS AND BOTTOM OF RISER AND EVERY 15 FEET HORIZONTAL KITCHEN EXHAUST DUCT.
2. CLEANOUT OPENINGS SHALL BE PROVIDED AT EVERY CHANGE IN DIRECTION AND WITHIN 3 FEET OF THE EXHAUST FAN.
3. CLEANOUT OPENINGS SHALL BE EQUIPPED WITH TIGHT-FITTING DOORS CONSTRUCTED OF STEEL HAVING A THICKNESS NOT LESS THAN THAT REQUIRED FOR THE DUCT. DOORS SHALL BE EQUIPPED WITH A SUBSTANTIAL METHOD OF LATCHING, SUFFICIENT TO HOLD THE DOOR TIGHTLY CLOSED. DOOR ASSEMBLIES SHALL HAVE A GASKET OR SEALANT THAT IS NON-COMBUSTIBLE AND LIQUID TIGHT AND SHALL NOT HAVE FASTENERS THAT PENETRATED THE DUCT.
4. THE CLEANOUTS FOR HORIZONTAL GREASE DUCT SHALL BE LOCATED ON THE SIDE OF THE DUCT WITH THE OPENING NOT LESS THAN 1" FROM THE EDGES OF THE DUCT.
5. COMMERCIAL KITCHEN GREASE DUCTS SHALL BE DESIGNED FOR THE TYPE OF COOKING APPLIANCE AND HOOD SERVED.
6. JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS SHALL BE MADE WITH A CONTINUOUS LIQUID TIGHT WELD OR BRAZE MADE IN THE EXTERNAL SURFACE IF THE DUCT SYSTEMS.
7. DUCT TO EXHAUST FAN CONNECTIONS SHALL BE FLANGED, GASKETED AND BOLTED TO THE INLET AND OUTLET OF THE FAN FOR INLINE FANS. APPROVED FLEXIBLE CONNECTIONS MAY BE PROVIDED.
8. A VIBRATION ISOLATION CONNECTOR FOR CONNECTING A DUCT TO A FAN SHALL CONSIST OF NON-COMBUSTIBLE PACKING IN A METAL SLEEVE JOINT OF APPROVED DESIGN OR SHALL BE A COATED-FABRIC FLEXIBLE DUCT CONNECTOR LISTED AND LABELED FOR THE APPLICATION. VIBRATION ISOLATION CONNECTORS SHALL BE INSTALLED ONLY AT THE CONNECTION OF A DUCT TO A FAN INLET OR OUTLET.
9. PRIOR TO THE USE OR CONCEALMENT OF ANY PORTION OF A GREASE DUCT SYSTEM, A LEAKAGE TEST SHALL BE PERFORMED. DUCT SHALL BE CONSIDERED TO BE CONCEALED WHERE INSTALLED IN SHAFTS OR COVERED BY COATINGS OR WRAPS THAT PREVENT THE DUCTWORK FROM VISUALLY INSPECTED ON ALL SIDE. THE DUCT INSTALLER SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY EQUIPMENT AND PERFORMING THE GREASE DUCT LEAKAGE TEST. THE DUCT LEAKAGE TEST SHALL BE PERFORMED FOR ALL THE DUCT SYSTEMS, INCLUDING THE DUCT-TO-DUCT CONNECTION. THE DUCTWORK SHALL BE PERMITTED TO BE TESTED IN SECTIONS, PROVIDED THAT EVERY JOINT IS TESTED (IF TEST IS FAILED, CONTRACTOR TO PROVIDE NEW KITCHEN EXHAUST DUCT).
10. PROVIDE SMOKE TEST TO PROVE TIGHTNESS OF THE GREASE DUCT.
11. GREASE DUCT BRACING AND SUPPORTS SHALL BE OF NON-COMBUSTIBLE MATERIAL SECURELY ATTACHED TO THE STRUCTURE AND DESIGNED TO CARRY GRAVITY AND SEISMIC LOADS WITHIN THE STRESS LIMITATIONS OF THE INTERNATIONAL BUILDING CODE. BOLTS, SCREWS, RIVETS AND OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE DUCT WALLS.
12. A RESIDUE TRAP SHALL BE PROVIDED AT THE BASE OF EACH VERTICAL RISER WITH PROVISION FOR CLEANOUTS IN ACCORDANCE WITH NFPA 96.
13. A GREASE DUCT SERVING THE TYPE-1 HOOD THAT PENETRATED A CEILING, WALL OR FLOOR SHALL BE ENCLOSED FROM THE FIRE POINT OF PENETRATION TO THE OUTLET TERMINAL. DUCT ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THAT OF THE FIRE-RESISTANCE RATED ASSEMBLY PENETRATED BUT NEED NOT EXCEED 2 HOURS.
14. KITCHEN-EXHAUST OUTLETS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM PARTS OF THE SAME OR CONTIGUOUS BUILDINGS, ADJACENT BUILDINGS AND ADJACENT PROPERTY LINE. THIS EXHAUST OUTLETS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM AND NOT LESS THAN 3 FEET ABOVE AIR INTAKE OPENINGS INTO ANY BUILDING.
15. PROVIDE UL LISTED 2 LAYERS OF 1.5" THICK FIRE WARP, TESTED IN ACCORDANCE WITH ASTM E2336 FOR TYPE-I EXHAUST DUCTS. FIRE WRAP TO PROVIDE 1 OR 2-HR ENCLOSURE. THROUGH PENETRATION FIRE STOP SYSTEMS ARE TO BE TESTED IN ACCORDANCE WITH ASTM E 814 (UL1479). FOIL COVERING TO BE PROVIDED ABOVE INSULATION.
16. GREASE DUCTS SHALL BE INSTALLED WITH A MINIMUM SLOPE OF 2% FOR HORIZONTAL RUNS UP TO 75 FEET AND A MINIMUM SLOPE OF 8% FOR HORIZONTAL RUNS EXCEEDING 75 FEET. FACTORY-BUILT GREASE DUCTS SHALL BE PERMITTED TO BE INSTALLED AT A LESSER SLOPE WHERE INSTALLED IN ACCORDANCE WITH THEIR LISTING AND THE MANUFACTURER'S INSTRUCTIONS. ALL HORIZONTAL GREASE DUCTS SHALL INCLUDE ACCESS FOR CLEANING AND INSPECTION IN ACCORDANCE WITH SECTION 510.3.3.

3 COMMERCIAL KITCHEN NOTES



1 MECHANICAL FLOOR PLAN

SCALE: ¼"=1'-0"

Property of NY Engineers

GENERAL NOTES:

1. ALL WORK SHALL COMPLY WITH ALL LOCAL AND STATE CODES AND AUTHORITIES HAVING JURISDICTION.
2. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND ARRANGE ALL REQUIRED INSPECTIONS.
3. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS AND TRADES.
4. THESE DRAWINGS, AS PREPARED, ARE DIAGRAMMATIC BUT SHALL BE FOLLOWED AS CLOSELY AS CONSTRUCTION OF THE PROJECT AND THE WORK OF THE TRADES WILL PERMIT. EQUIPMENT LOCATIONS INDICATED ARE APPROXIMATE. COORDINATE EXACT LOCATIONS AND REQUIRED CLEARANCES WITH EQUIPMENT SUPPLIER AND ALL TRADES PRIOR TO INSTALLATION.
5. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL THE EQUIPMENT INDICATED WITHIN THE MECHANICAL DRAWINGS UNLESS OTHERWISE NOTED. ALL EQUIPMENT SHALL BE UL LISTED. VERIFY LOCATION AND DIMENSIONS IN THE FIELD PRIOR TO FABRICATION AND / OR INSTALLATION.
6. EACH UNIT GENERATING CONDENSATE SHALL BE PROVIDED WITH A CONDENSATE DRAIN WITH EXTERNAL, 4" DEEP P-TRAP. EXTEND DRAIN TO A ROOF MOUNTED SPLASH PAD OR AN ACCEPTABLE LOCATION REQUIRED BY CODE.
7. DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSION.
8. ALL METAL DUCT AND AIR DISTRIBUTION DEVICES SHALL BE INSULATED WITH R-6, 75 DENSITY FOIL-BACKED INSULATION WITH FIRE AND SMOKE RATING 25-50).
9. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, SEALED, AND INSULATED PER THE LATEST ISSUE OF SMACNA LOW-VELOCITY DUCT MANUAL.
10. ALL FLEX DUCT SHALL BE UL LISTED, R-6. FOIL-BACKED, CLASSIFIED AS A CLASS 1 AIR DUCT.
11. THE CONTRACTOR SHALL COORDINATE DIFFUSER LOCATIONS ON SITE WITH THE MOST RECENT REFLECTED CEILING PLAN.
12. THE CONTRACTOR IS TO MAKE ALL LOW-VOLTAGE WIRING CONNECTIONS FOR ALL HVAC EQUIPMENT INCLUDING TEMPERATURE CONTROLS, ROOF TOP UNITS, SMOKE DETECTORS AND CONTRACTOR PANEL.
13. PROVIDE AND INSTALL SMOKE DUCT DETECTORS IN EACH AIR CONDITIONING UNIT SUPPLY DUCT GREATER THAN 2000 CFM. CONTRACTOR SHALL PROVIDE INTERCONNECTION AND WIRE TO THE FIRE ALARM CONTROL PANEL IF REQUIRED. DUCT DETECTORS SHALL HAVE REMOTE TEST STATIONS LOCATED IN THE OFFICE NEAR THE RESPECTIVE THERMOSTATS. VERIFY CODE REQUIREMENTS FOR DUCT DETECTORS IN BOTH THE SUPPLY AND RETURN AIR STREAMS.
14. THE ENTIRE INSTALLATION SHALL BE GUARANTEED FREE OF DEFECTS AND CONTRACTOR SHALL REPAIR AND / OR REPLACE ANY DEFECTIVE MATERIALS OR EQUIPMENT AT NO COST TO THE OWNER FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY ARCHITECT OR ENGINEER.
15. ALL WORK SHALL BE SUBJECT TO THE ACCEPTANCE AND APPROVAL OF THE ARCHITECT AND OWNER. THE ARCHITECT SHALL BE NOTIFIED OF ANY AND ALL DISCREPANCIES BETWEEN FIELD CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE OF PROPER NOTIFICATION DOES NOT RELIEVE THE CONTRACTOR. THE CONTRACTOR SHALL CORRECT ANY AND ALL WORK ARISING FROM SUCH FAILURE TO COORDINATE DISCREPANCIES TO THE SATISFACTION OF THE ARCHITECT WITHOUT ADDITIONAL COST TO THE OWNER.
16. THE CONTRACTOR SHALL, UPON COMPLETION OF PROJECT, PERFORM A COMPLETE TEST AND BALANCE OF ALL EQUIPMENT. PROVIDE A WRITTEN REPORT TO THE ARCHITECT. ALL CAPACITIES MUST BE SET TO WITHIN ±10% OF AMOUNTS INDICATED ON THE FLOOR PLAN AND SCHEDULES.
17. 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/ROOFS.
18. CONTRACTOR TO PROVIDE CORD OPERATED DAMPERS IN INACCESSIBLE CEILINGS.
19. PROVIDE FIRE OR FIRE/SMOKE DAMPERS WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATING OF THE WALLS.

KEY NOTES:

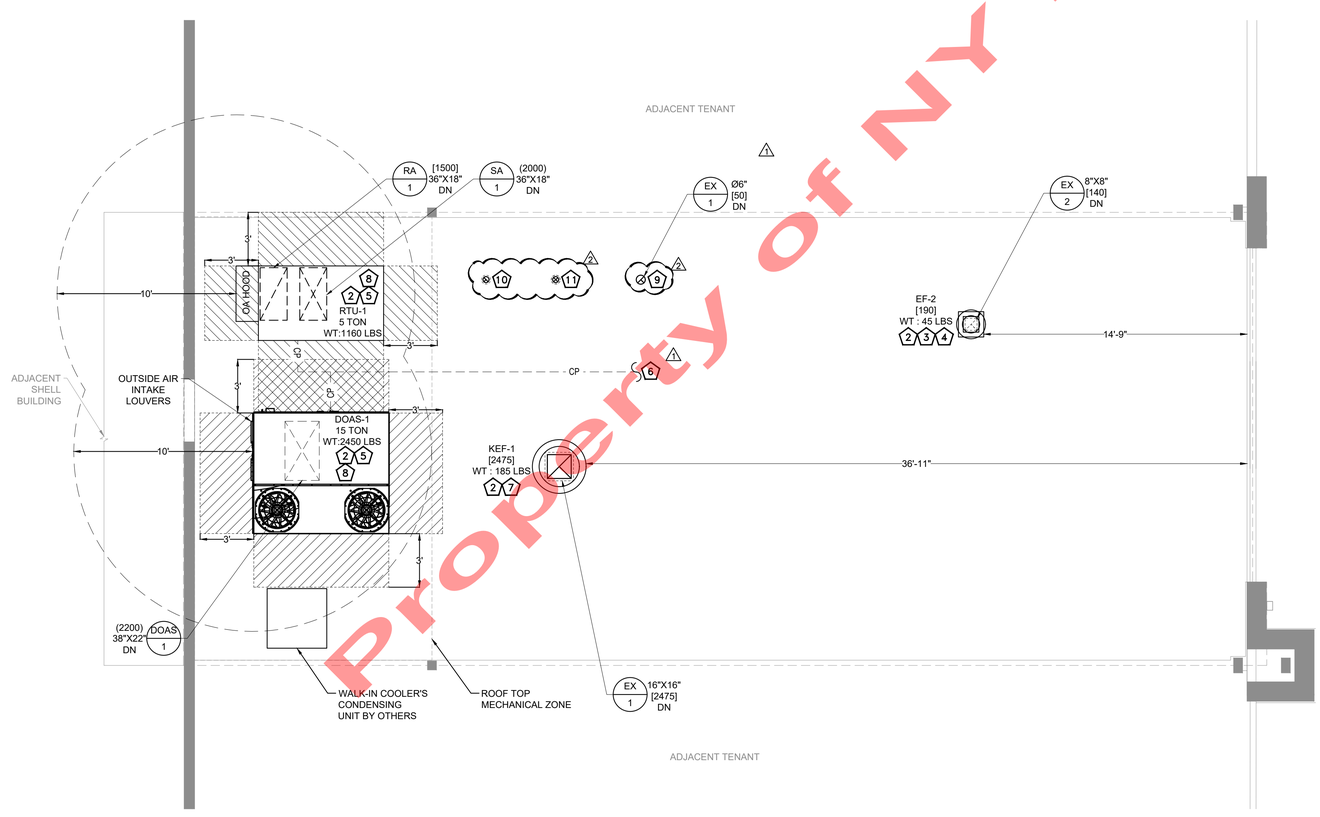
1. PROVIDE PROGRAMMABLE THERMOSTAT FOR RTU-1 WITH LOCKING COVER. COORDINATE FINAL LOCATION OF THERMOSTAT WITH ARCHITECT/OWNER. SEAL WALL OPENINGS WITH CAULK. COORDINATE LOCATION ON SITE WITH GENERAL CONTRACTOR AND EQUIPMENT. AVOID LOCATING NEAR OR ABOVE SOURCES OF HEAT. PROVIDE REMOTE SENSOR IN RETURN AIR DUCT OF RTU & WIRE BACK TO T-STAT.
2. CONTRACTOR SHALL PROVIDE Ø5" STAINLESS STEEL (NON-COMBUSTIBLE) VENTING FOR EXHAUST FROM GAS-FIRED WATER HEATERS TO ROOF TERMINATION AS PER MANUFACTURER'S RECOMMENDATION. ROUTE PIPING FROM RESPECTIVE UNIT TO LOCATION INDICATED ON ROOF PLAN. ROUTE PIPING WITH MINIMAL AMOUNT OF BENDS AND MINIMUM LENGTH AS REQUIRED BY RESPECTIVE UNIT MANUFACTURER'S REQUIREMENTS.
3. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM RTU-1 AND SUPPLY DUCT FROM THE DOAS-1 TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
4. HOOD CONTROL PANEL AND FIRE SUPPRESSION SYSTEM FURNISHED BY HOOD SUPPLIER AND INSTALLED ON WALL BY HVAC CONTRACTOR. HOOD FIRE SUPPRESSION SYSTEM FURNISHED AND INSTALLED BY LICENSED FIRE SUPPRESSION CONTRACTOR. F.S. CONTRACTOR TO SUBMIT PLAN AND OBTAIN APPROVAL UNDER SEPARATE PERMIT APPLICATION PRIOR TO COMMENCEMENT OF WORK. CONTRACTOR TO COORDINATE & CONFIRM FINAL LOCATION OF CONTROL & FIRE SUPPRESSION PANEL ON FIELD.
5. PROVIDE PROGRAMMABLE THERMOSTAT FOR DOAS-1 WITH LOCKING COVER. SEAL WALL OPENINGS WITH CAULK. COORDINATE LOCATION ON SITE WITH GENERAL CONTRACTOR AND EQUIPMENT. AVOID LOCATING NEAR OR ABOVE SOURCES OF HEAT. PROVIDE REMOTE SENSOR IN SUPPLY AIR DUCT OF DOAS-1 & WIRE BACK TO T-STAT.
6. INSTALL TYPE-1 GREASE HOOD OVER APPLIANCES AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. REFER TO HOOD DETAIL SHEETS, THIS SET. CONFIRM LOCATION ON SITE WITH MOST RECENT KITCHEN EQUIPMENT PLANS.
7. PROVIDE GREASE DUCT WITH KITCHEN EXHAUST EQUIPMENT, INSTALLED BY MECHANICAL CONTRACTOR. DUCT SHALL EXTEND CONTINUOUSLY FROM HOOD TO EXHAUST FAN/TERMINATION. DUCT SHALL BE FACTORY-BUILT UL 1978/UL 2221 LISTED OR FIELD-BUILT CARBON STEEL 16 GAUGE / STAINLESS STEEL 18 GAUGE, WITH ALL SEAMS AND JOINTS LIQUID-TIGHT.
8. INSTALL IN ACCORDANCE WITH MANUFACTURER, LISTING, AND, PROVIDE CLEANOUTS AS REQUIRED, AND PROTECT DUCTS THROUGH FIRE-RATED ASSEMBLIES WITH CONTINUOUS SHAFT OR LISTED FIRESTOP SYSTEM.
9. PROVIDE AND INSTALL EMERGENCY MANUAL HOOD SUPPRESSION ACTIVATION DEVICE. DEVICE SHALL BE READILY ACCESSIBLE OUTSIDE COOKING AREA, MOUNTED AT ACCESSIBLE HEIGHT, AND CLEARLY LABELED TO IDENTIFY THE HAZARD PROTECTED. VERIFY WITH G.C. LOCAL AUTHORITY NUMBER OF PULLS, FINAL LOCATION(S,) AND HEIGHT ABOVE FINISH FLOOR.
10. ROUTE 8"x8" EXHAUST DUCT UP TO THE ROOF & CONNECT TO ROOF MOUNTED EXHAUST FAN EF-2. PROVIDE NECESSARY TRANSITION PIECE FOR FAN CONNECTION. CONTRACTOR TO FIELD VERIFY FIRE RATING OF ROOF. PROVIDE FIRE DAMPER AT ROOF PENETRATION AS/IF REQUIRED BY LOCAL CODES.
11. PROVIDE NEW DUCT SMOKE DETECTOR (IN SUPPLY AIR DUCT) & IT SHALL BE FURNISHED / INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL/ FIRE ALARM CONTRACTOR TO SHUT DOWN CORRESPONDING UNIT UNDER ALARM CONDITIONS. ALL WIRING SHALL BE IN CONDUIT PER NEC SMOKE DETECTOR SHALL BE SYSTEM SENSOR MODEL DH100ACDCLP OR EQUAL.
12. CONTRACTOR SHALL PROVIDE Ø4" COMBUSTION INTAKE VENT FOR GAS-FIRED WATER HEATERS TO ROOF AS PER MANUFACTURER'S RECOMMENDATION. CONTRACTOR SHALL PROVIDE VULCAN VENT MODEL: VER4 (OR EQUIVALENT W.U.I. COMPLIANT) FOR WATER HEATER COMBUSTION AIR INTAKE ON ROOF.

2 MECHANICAL GENERAL NOTES & FLOOR PLAN KEYNOTES

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MECHANICAL FLOOR PLAN

M101



1 MECHANICAL ROOF PLAN

GENERAL NOTES

1. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
2. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
3. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
4. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
5. PROVIDE A NEW CURB TO ENSURE THE PROPER INSTALLATION OF THE NEW ROOFTOP UNIT (RTU) AND DOAS UNIT.
6. 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.

KEY NOTES:

1. NOT USED
2. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS.
3. BATHROOM & MOP SINK EXHAUST FAN (EF-2). INTERCONNECT FAN WITH RTU-1. VERIFY EXACT LOCATION ON THE ROOF PRIOR TO INSTALLATION.
4. BATHROOM & MOP SINK EXHAUST SHALL TERMINATE 3 FEET FROM THE PROPERTY LINE, 3 FEET FROM THE EXTERIOR WALL AND ROOFS, 3 FEET FROM THE OPERABLE OPENING INTO THE BUILDING AND 10 FEET FROM THE OUTSIDE AIR INTAKE OPENINGS.
5. CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE SHOULD BE AT LEAST 10' AWAY FROM THE RTU & MAU'S OUTSIDE AIR INTAKE.
6. CONTRACTOR SHALL INSTALL CONDENSATE DRAIN PIPING FROM RTU-1 AND DOAS-1 TO THE NEAREST SCUPPER OR OTHER APPROVED POINT OF DISPOSAL. PROVIDE CONTINUOUS PIPING WITH A MINIMUM HORIZONTAL SLOPE IN THE DIRECTION OF DISCHARGE OF NOT LESS THAN 1/8 INCH VERTICAL PER 12 INCHES HORIZONTAL (1% SLOPE). CONDENSATE SHALL NOT DISCHARGE ONTO STREETS, ALLEYS, OR OTHER AREAS WHERE IT MAY CREATE A NUISANCE OR HAZARDOUS CONDITION. COORDINATE THE EXACT DISCHARGE LOCATION IN THE FIELD.
7. KITCHEN EXHAUST TERMINATION SHALL TERMINATE 10 FEET FROM PROPERTY LINE, 40 INCH ABOVE ROOF, 3 FEET ABOVE ANY AIR INTAKE OPENING INTO BUILDING AND 10 FEET AWAY FROM ANY OUTSIDE AIR INTAKES.
8. PROVIDE HAIL GUARD FOR RTU-1 & DOAS-1 PROTECTING CONDENSER COIL FROM GREASE.
9. CONTRACTOR SHALL PROVIDE VULCAN VENT MODEL: VER6 (OR EQUIVALENT W.U.I. COMPLIANT) FOR Ø6" TOILET EXHAUST TERMINATIONS ON ROOF. INSTALL VENT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. PER ZONE C WUIC 506.5, VENT IS NON-COMBUSTIBLE, CORROSION-RESISTANT, AND FEATURES A 1/8" MESH WITH AN INTUMESCENT CORE FOR EMBER RESISTANCE.
10. CONTRACTOR SHALL PROVIDE Ø5" STAINLESS STEEL (NON-COMBUSTIBLE) VENTING FOR EXHAUST FROM GAS-FIRED WATER HEATERS TO ROOF TERMINATION. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS. EXHAUST TERMINATION SHALL USE A STAINLESS STEEL BIRD SCREEN PER MANUFACTURER SAFETY STANDARDS.
11. CONTRACTOR SHALL PROVIDE VULCAN VENT MODEL: VER4 (OR EQUIVALENT W.U.I. COMPLIANT) FOR WATER HEATER COMBUSTION AIR INTAKE ON ROOF. INSTALL VENT IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. PER ZONE C WUIC 506.5, VENT IS NON-COMBUSTIBLE, CORROSION-RESISTANT, AND FEATURES A 1/8" MESH WITH AN INTUMESCENT CORE FOR EMBER RESISTANCE.

SCALE: ¼"=1'-0"

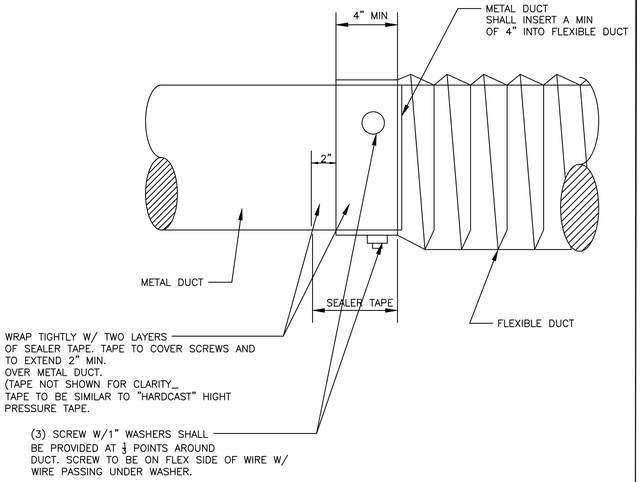
2 MECHANICAL GENERAL NOTES & ROOF PLAN KEYNOTES

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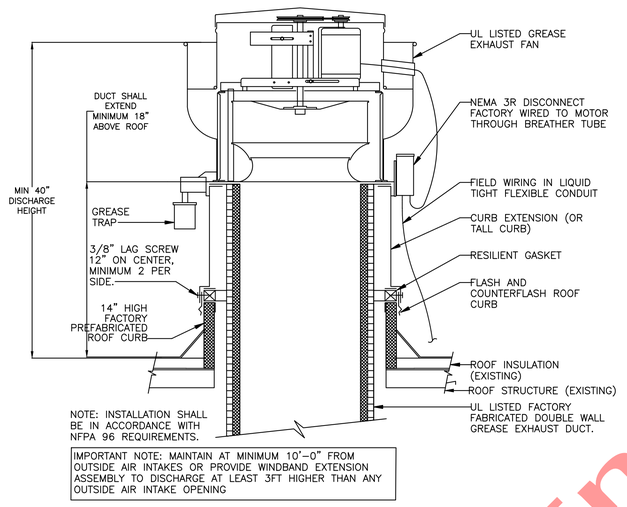
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MECHANICAL ROOF PLAN

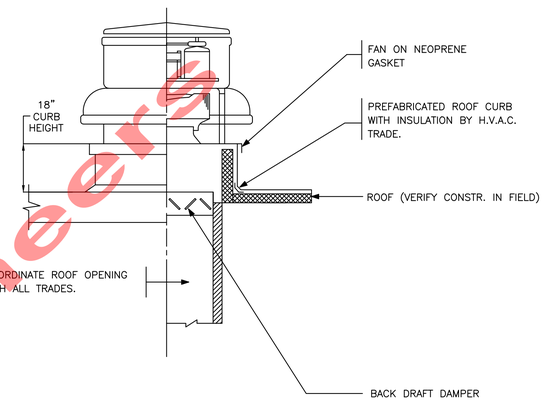
M102



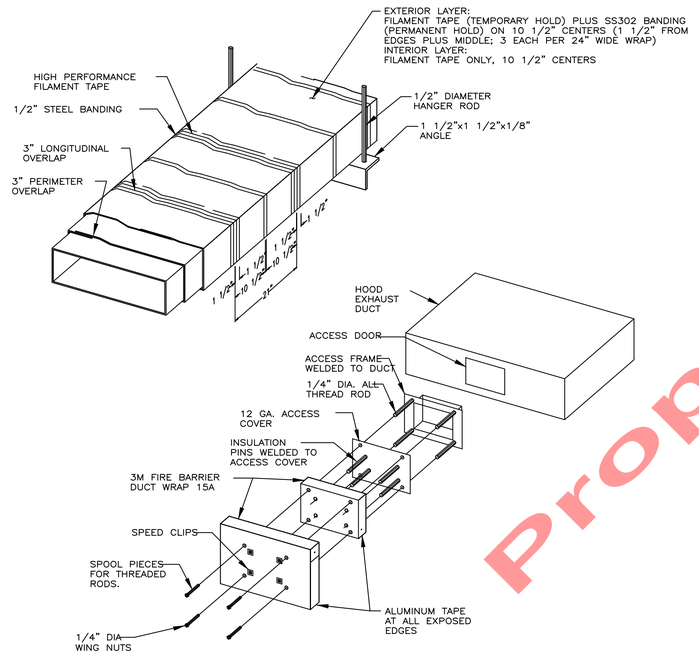
1 FLEXIBLE DUCT/RIGID DUCT CONNECTION DETAIL N.T.S



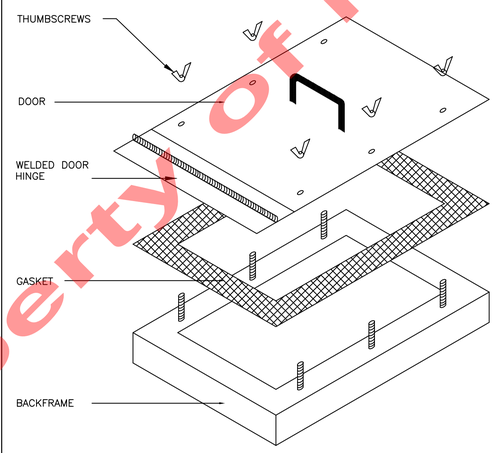
2 KITCHEN EXHAUST FAN (UP BLAST) DETAIL N.T.S



3 DOWN BLAST FAN N.T.S



4 GREASE DUCT WRAP DETAIL N.T.S

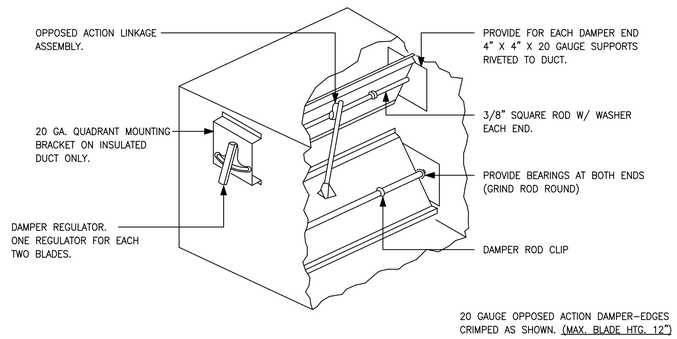


NOTES:

1. ACCESS DOOR IS TO BE DUCTMATE ULTIMATE DOOR II OR EQUAL.
2. ACCESS DOOR IS TO BE U.L. LISTED # 65X3.
3. ACCESS DOOR IS TO MEET OR EXCEED THE REQUIREMENTS OF NFPA 96, 2008 EDITION

AT ALL LOCATIONS REQUIRED BY LOCAL CODE.

5 GREASE DUCT ACCESS DOOR DETAIL N.T.S



20 GAUGE OPPOSED ACTION DAMPER-EDGES
CRIMPED AS SHOWN. (MAX. BLADE HTG. 12")

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

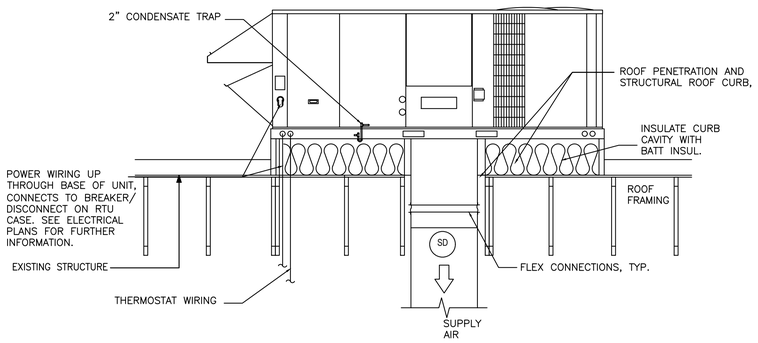
6 LOW PRESSURE BALANCING DAMPER N.T.S

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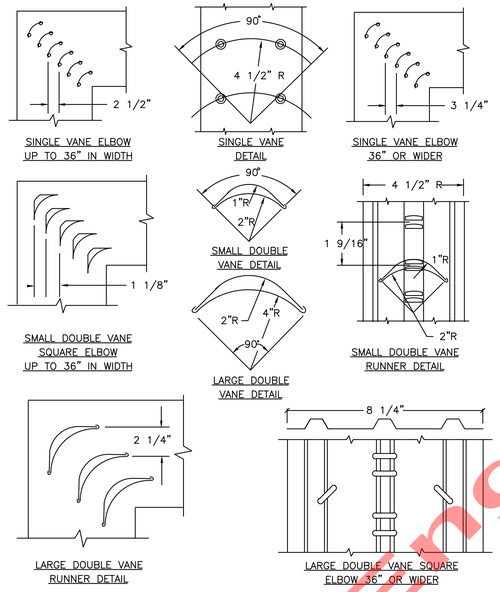
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MECHANICAL
DETAILS(01 OF 03)

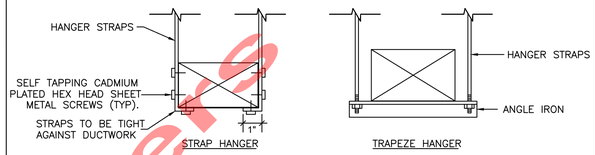
M501



1 TYPICAL DOAS UNIT DETAIL N.T.S



2 LOW VELOCITY DUCTWORK ELBOWS N.T.S



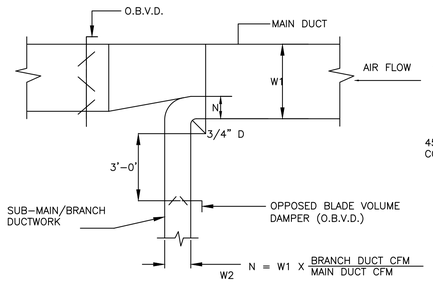
NOTE:
NO POP RIVETS ALLOWED, USE SELF-TAPPING SHEETMETAL SCREWS ONLY.

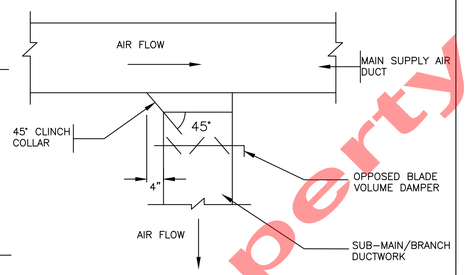
HANGER SIZES*

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"

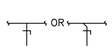
* FOR RECTANGULAR DUCTS

3 METHOD OF HANGING DUCTWORK N.T.S

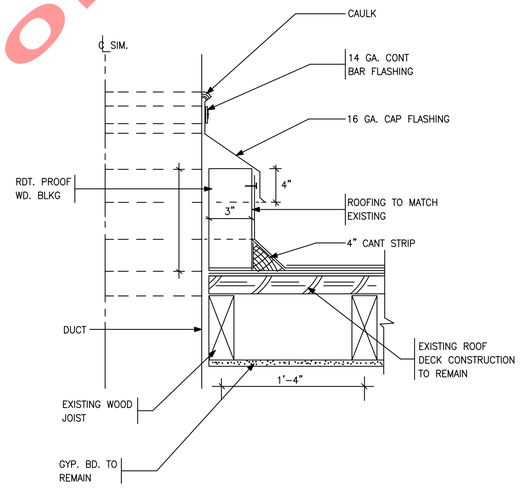




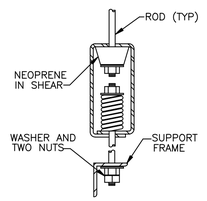
NOTE:
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE DUCTWORK IS INDICATED AS THIS



4 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION N.T.S



5 DUCT PENETRATION THRU ROOF N.T.S



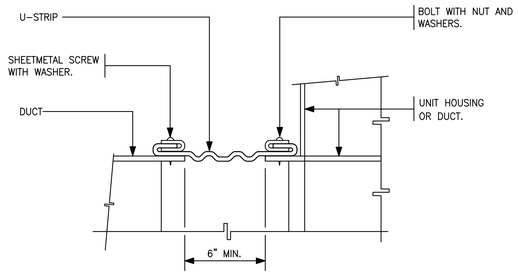
6 VIBRATION ISOLATOR DETAIL N.T.S

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MECHANICAL DETAILS(02 OF 03)

M502



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

NOTES:
DUCTS TO BE ACOUSTICALLY LINED SHALL BE DESIGNATED BY THE SYMBOL IN FIG. "C" TO THE EXTENT OF LINING. THICKNESS SHALL BE AS SPECIFIED.
DUCTS LINED WITH ACOUSTICAL MATERIAL SHOULD BE FASTENED WITH CLIPS, ADHESIVE, OR PINS

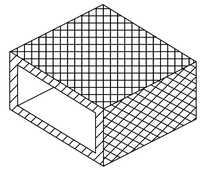


FIG. A

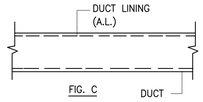


FIG. C

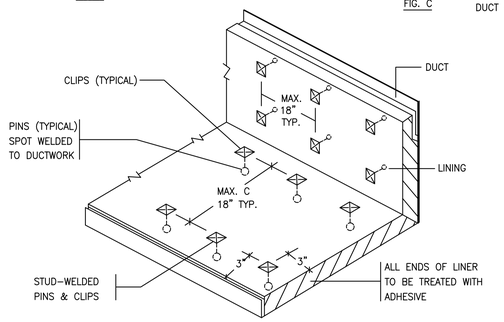
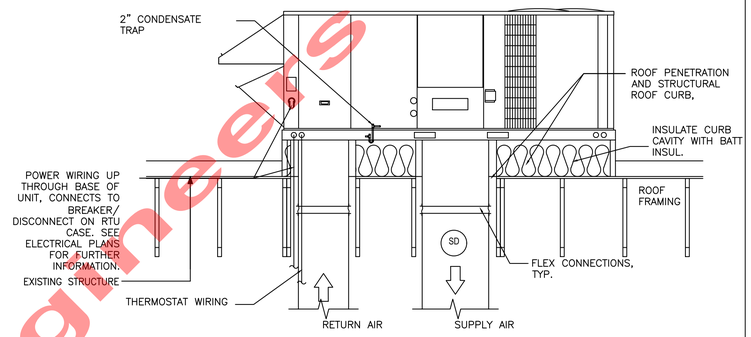
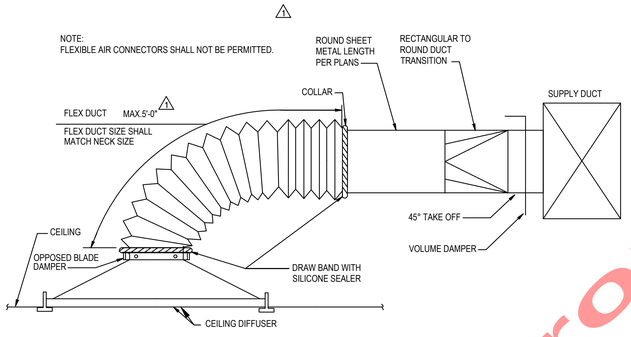


FIG. B

2 ACOUSTIC TREATMENT DUCT LINING N.T.S



3 RTU UNIT INSTALLATION DETAIL N.T.S



4 TYPICAL DIFFUSER CONNECTION N.T.S

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MECHANICAL DETAILS(03 OF 03)

M503

HOOD INFORMATION – JOB#2620018

HOOD NO	TAG	MODEL	MANUFACTURER	LENGTH	MAX # OF TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL CFM	EXHAUST PLENUM WIDTH	LONG HEIGHT	SHORT HEIGHT	DIM.	STYLE	KEL	SW	HOOD CONSTRUCTION	HOOD CONFIG. ISLAND	ROW
1	#10	5424 (64+96+64)	ADVANCED HOOD	9' 0"		I	HEAVY	275	2475	12"	23"	4"	24"	5TR	1350	0.45 W	430 SS WHERE EXPOSED	ALONE	ALONE

HOOD INFORMATION

HOOD NO	TAG	FILTER(S) TYPE	QTY	HEIGHT	LENGTH	EFFICIENCY @ 7 MICRONS	QTY	UTILITY COMPONENTS FIRE SUPPRESSION TYPE	WIRE GUARD	LOCATION	SIZE	SYSTEM(S) TYPE	SIZE	SWITCHES(S) MODEL #	QUANTITY	FIRE DAMPER(S) PIPING	HOOD WEIGHT
1	#10	CAPTIVATE SOLID FILTER	6	20"	144"	85% SEE FILTER SPEC	3	RECESSED ROUND	NO							YES	446 LBS

HOOD OPTIONS

HOOD NO	TAG	OPTION
1	#10	FIELD WRAPPED 18.50" HIGH FRONT, LEFT, RIGHT BACKSPLASH - 122.50" HIGH X 144.00" LONG - AISI 304 - VERTICAL LEFT - QUARTER TAN PANEL - 12" TOP WIDTH - 0" BOTTOM WIDTH - 23" HIGH - #430 SS RIGHT - QUARTER TAN PANEL - 12" TOP WIDTH - 0" BOTTOM WIDTH - 23" HIGH - #430 SS

CLEARANCE TO COMBUSTIBLES

HOOD #	SURFACE	CLEARANCE
1	TOP	18"
	FRONT	0"
	BACK	18"
	LEFT	18"
	RIGHT	18"

– 18" CLEARANCE TO COMBUSTIBLES CONFORMS TO UL710 STANDARDS.

SPECIFICATION: CAPTIVATE GREASE-STOP SOLID FILTER

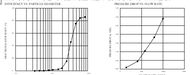
THE CAPTIVATE GREASE-STOP SOLID FILTER IS A SINGLE-STAGE FILTER FEATURING A UNIQUE 3-BAFFLE DESIGN IN CONJUNCTION WITH A SLOTTED REAR BAFFLE DESIGN, TO DELIVER 85% FILTRATION EFFICIENCY.

– MADE OF STAINLESS STEEL CONSTRUCTION, AND SIZED TO FIT INTO STANDARD 2-INCH DEEP HOOD CHANNELS.

– EACH SHALL INCLUDE STAINLESS STEEL HANDLES AND A FASTENING DEVICE TO SECURE THE TWO FILTERS TOGETHER AT THE CENTER.

– GREASE EXTRACTION EFFICIENCY PERFORMANCE SHALL REMOVE AT LEAST 70% OF GREASE PARTICLES FIVE MICRONS IN SIZE AND ABOVE GREASE PARTICLES SEVEN MICRONS IN SIZE AND ABOVE SHALL BE REMOVED AT AN EFFICIENCY RATE OF 85% AS TESTED BY ASTM METHOD E1294-89, WATER GAUGE.

– THE CAPTIVATE GREASE-STOP SOLID WAS TESTED TO ASTM STANDARD ASTM F2519-05 BY MANUFACTURER APPROVED FOR USE IN SOLID FUEL APPLICATIONS AS A SPARK ARRESTER.

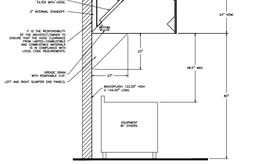


CAPTIVATE FILTERS ARE BUILT IN COMPLIANCE WITH:
– NSF/ANSI 2
– NOT STANDARD #1,
UL STANDARD #1046,
– CSA C22.2 NO. 0.
– ULC-S645.

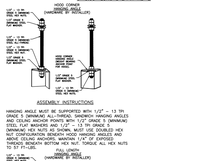
PATENT NUMBERS

EXHAUST HOODS NO-2/BD-2/BHD-2 (CANADA) – CA PATENT 2520435 C.

CLEARANCE TO COMBUSTIBLES

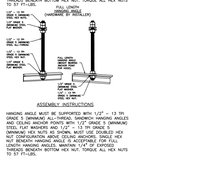


PLAN VIEW – HOOD #1 (#10)
5424 – (64+96+64)



ASSEMBLY INSTRUCTIONS

HANGING ANGLE MUST BE SUPPORTED WITH 1/2" – 13 TPI GRADE 5 DARKAMAC ALL-THREAD, SANDWICH HANGING ANGLES AND CEILING ANCHOR POINTS WITH 1/2" GRADE 5 DARKAMAC STEEL FLAT WASHERS AND 1/2" – 13 TPI GRADE 5 DARKAMAC HEX NUTS AS SHOWN. MUST USE DOUBLED HEX NUT CONFIGURATION ABOVE CEILING ANCHORS. SINGLE HEX NUT BENEATH HANGING ANGLE IS ACCEPTABLE FOR FULL THREADS. BENEATH BOTTOM HEX NUT. TORQUE ALL HEX NUTS TO 57 FT-LBS.

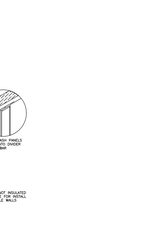


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SECTION VIEW – MODEL 5424AH-BD-2 (BHD-2 – #1 (#10))



BACKSPLASH



– BACKSPLASH IS NOT INSULATED AND IS UNSUITABLE FOR INSTALL AGAINST COMBUSTIBLE WALLS

AHS HOODS ARE BUILT IN COMPLIANCE WITH

NFPA #96
UL 710 & UL2221O STANDARDS
ETL LISTED 3054854-001

IMC 2021 SECTIONS 507, 508, & 509

FOR ANY QUESTIONS RELATED TO THE EQUIPMENT CONTAINED IN THIS DRAWING, PLEASE CONTACT ADVANCED HOOD SYSTEMS @ 954-571-2339.

REVISIONS

DESCRIPTION	DATE
1	
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ADVANCED HOOD SYSTEMS
Advanced Hoods Systems, LLC
FL. PHONE: 954-571-2339 | EMAIL: INFO@ADVANCEDHOODSYSTEMS.COM | WEB: WWW.ADVANCEDHOODSYSTEMS.COM

DATE: 9/30/2025
DWG.#: R263018
DRAWN BY: SPD'-140
SCALE: 3/4" = 1'-0"
MASTER DRAWING
SHEET NO. 1

FIRE SYSTEM INFORMATION – JOB#2620018

SYSTEM NO	TAG	TYPE	SIZE	MAX FT	DESIGN FT	INSTALLATION SYSTEM	LOCATION ON HOOD
1		TANK 7.5	K.0	20	20	UNINSTALLED	N/A

GAS VALVE(S)

SYSTEM NO	TAG	TYPE	SIZE	SUPPLIED BY
1		SC ELECTRICAL	2.000	ADVANCED HOOD SYSTEMS, LLC

FIRE SYSTEM PARTS LIST KEY

FIRE SYS NO	TAG	KEY NUMBER – PART DESCRIPTION	QTY. BY FACTORY	QTY. BY DIST
1		0 – 0 – TANK FIRE SUPPRESSION POST-DISCHARGE PROCEDURE UTILITY CABINET LABEL SHEET.	1	0
		0 – 0 – TANK FIRE SUPPRESSION DISCHARGE PROCEDURE LABEL SHEET.	1	0
		0 – 0 – TV-LV2021-12144-01" 360 DUCT FIRE THERMOSTAT WITH 12 FOOT WIRE LEADS. "NO-CLOSE ON TEMP RISE AT 360°F. (M2E3A310)	1	0
		0 – 0 – 4426-0125 1/2" MALE NPT TO 1/2" FEMALE NPT ELBOW, BRASS.	1	0
		0 – 0 – 1/4" MALE NPT TO 1/4" FEMALE NPT ELBOW, BRASS.	1	0
		1 – 0 – 75526, 1/2" BY PRO-PRESS ELBOW WITH 1/2 NPT FEMALE CONNECTION, VEGA.	1	0
		1 – 0 – 75666 1/2" X 1/2" PRO-PRESS 183 X 1/2 NPT FEMALE CONNECTION, VEGA.	1	0
		1 – 0 – 87-300001-001 TANK – PRESSURIZED TANK USED FOR TANK FIRE SUPPRESSION.	1	0
		1 – 0 – 87-300002-001 SYSTEM SUPERVISION, NORMALLY OPEN, PRESSURE RELEASE SOLENOID ASSEMBLY, FOR MODELS FOR FIRE SYSTEM SUPERVISION, NON-FIRE SUPPRESSION.	1	0
		2 – 0 – 87-300003-001 12in CONNECTOR, UNAPPLIED PART #SJ0451-201-EUSA, TANK FIRE SUPPRESSION, NON-FIRE SUPPRESSION, 12in CONNECTOR, UNAPPLIED	1	0
		3 – 0 – 87-300102-001 HARDWARE, SIA BOLTS, TANK FIRE SUPPRESSION.	4	0
		3 – 0 – 99934415 HARDWARE, DATAMCLICK LOCKING BRACKET SQUARE NUTS 5/16" ZNC, TANK FIRE SUPPRESSION.	2	0
		3 – 0 – AD23432 JUNCTION BOX FOR MANUAL PULL STATION, 4.13" DEEP BACK BOX, RED COLOR.	1	0
		3 – 0 – AD23433 MANUAL PULL STATION, SURFACE MOUNT, DPT, JB INDUSTRIES, 1/4" FLARE X 1/4" NPT HALF COUPLING, ADD 3A 10AH DEFAULT VALUE	1	0
		3 – 0 – DATAMCLICK DISCHARGE ADAPTER TANK LOCKING PLATE FOR FIRE SYSTEM TANK INSTALLATION	1	0
		3 – 0 – TANK STRAP, TANK FIRE SUPPRESSION	2	0
		3 – 0 – TANK STRAP, TANK STRAP – USED FOR TANK FIRE SUPPRESSION	2	0
		3 – 0 – TFS-UTILITYBRACKET TANK BRACKET FOR FIRE SYSTEM TANK INSTALLATION IN UTILITY CABINET, TANK FIRE SUPPRESSION	1	0
		3 – 1 – 99-1287452-000 DISCHARGE ADAPTER, TANK FIRE SUPPRESSION	1	0
		3A – M – AD23431 RED COLOR – 2WAY, SINGLE ACTION MANUAL ACTUATION DEVICE (PUSH/PULL CENTERS) WITH PROTECTIVE COVER, ONE C/O NORMALLY OPEN CONTACT.	1	0

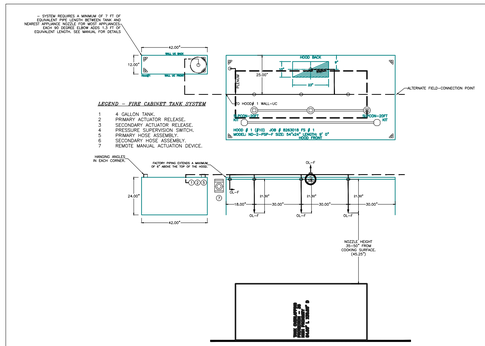
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MASTER DRAWING
SHEET NO. 2

– SYSTEM REQUIRES A MINIMUM OF 7 FT OF EQUIVALENT PIPE LENGTH BETWEEN TANK AND NEAREST APPLIANCE NOZZLE FOR MOST APPLIANCES. EACH 90 DEGREE ELBOW ADDS 5.5 FT OF EQUIVALENT LENGTH. SEE MANUAL FOR DETAILS.



LEGEND – FIRE CABINET TANK SYSTEM

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

NOTES:
– FIELD PIPE DROPS AS SHOWN.
– PIPING, ELBOWS, TEES, AND NOZZLES SUPPLIED BY CAS.
– FIELD INSTALLER SHALL CUT ALL PIPING TO FIT. 2 SIZES LONG PIECES OF CHROME PIPE ARE SHIPPED LOOSE TO BE FIELD-INSTALLED.
– SHIP LOOSE DROP FACTORY WILL PROVIDE THE EXACT CHROME PIPE LENGTH NEEDED BEFORE NOZZLES TO BE FIELD-INSTALLED.
– SECONDARY NOZZLES SHALL NOT BE BLOCKED BY SHELVING, SALAMANDERS, ETC.
– OVERHEAD CLEARANCE SHALL NOT BE USED ON ANY APPLIANCE WITH AN OBSTRUCTION, SUCH AS A SHELF, THAT IS LOCATED ABOVE THE COOKING SURFACE.
– 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 PRE-ENGINEERED FIRE SYSTEM COMPLIES WITH U.L. 300 REQUIREMENTS.
– OL-F NOZZLE PART NUMBER REPLACES 3070-3/8H-10-SS

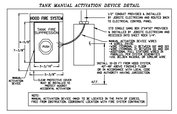
JOB #: R263018
JOB NAME: FLAME BROILER – AUSTIN TX– – REV1.

SYSTEM SIZE: TANK–SP–1–HC DESIGN FP: 20, MAXIMUM FP: 20.
HOOD # 1 9' 0.00" LONG x 54" WIDE x 24" HIGH.
HOOD # 1 1 SUPPLY RUN.
HOOD # 1 METAL BLOW-OFF CAPS INCLUDED.

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

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

TANK MANUAL ACTIVATION DEVICE DETAIL

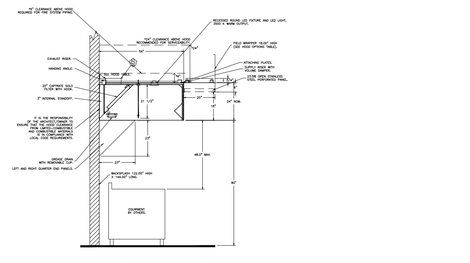


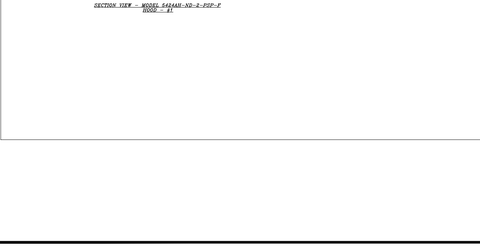
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SHEET NO. 3





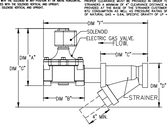
SECTION VIEW – MODEL 5424AH-BD-2-PSP-F
HOOD – #1

GAS VALVES AND STRANDERS

GAS VALVE SIZING											INSTALLATION		PART NUMBERS	
TYPE	SIZE	VOLTAGE	MIN. PRESS. W.C. (IN.W.C.)	MAX. PRESS. W.C. (IN.W.C.)	FLOW AT 1 W.C. (CFH)	FLOW AT 1 PSI (CFH)	DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E"	VALVE ORIENTATION	GAS STRAINER PART NUMBER	GAS SOLENOID KIT
GAS VALVE FOR FLAME BROILER	ELECTRICAL	2"	7.00 W.C.	10.5 W.C.	3,000 CFH	11,000 CFH	5"-1/4"	5"-1/4"	11"-1/4"	10-1/4"	11"-1/4"	HORIZONTAL OPENING	621-0800	621-0800-KIT

NOTE: GAS VALVES REQUIRING ASSEMBLY
1. ALL GAS VALVES MUST BE INSTALLED WITH THE SOLENOID IN AN UPRIGHT POSITION (+ OR – 45° FROM VERTICAL). 2. A MINIMUM STRAIGHT RUN OF 4" CLEARANCE REQUIRED MUST BE MAINTAINED BEFORE AND AFTER THE GAS VALVE. 3. ALL GAS VALVES MUST BE INSTALLED WITH THE FLOW IN THE DIRECTION SHOWN ON THE VALVE BODY. 4. ALL GAS VALVES MUST BE INSTALLED WITH THE SOLENOID ON THE INLET SIDE OF THE VALVE. 5. ALL GAS VALVES MUST BE INSTALLED WITH THE SOLENOID VERTICAL AND UPRIGHT.

CALCULATIONS
GAS FLOW CFH (CUBIC FEET PER HOUR) = BTU/HR / PRESSURE (INCH W.C.) X SPECIFIC GRAVITY
NEW BTU/HR = EXISTING BTU X (NEW PRESSURE (INCH W.C.) / EXISTING PRESSURE (INCH W.C.)) X (EXISTING SPECIFIC GRAVITY / NEW SPECIFIC GRAVITY)
NEW BTU/HR = EXISTING BTU X (NEW PRESSURE / EXISTING PRESSURE) X (EXISTING SPECIFIC GRAVITY / NEW SPECIFIC GRAVITY)
NEW BTU/HR = EXISTING BTU X (NEW PRESSURE / EXISTING PRESSURE) X 1 (SAME SPECIFIC GRAVITY)



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FLAME BROILER

HOOD DETAILS(01 OF 04

M504

EXHAUST FAN INFORMATION — JOB#8263018

FAN NO.	TAG	QTY	FAN UNIT MODEL #	MANUFACTURER	CFM	ESP	RPM	MOTOR SPEED	HP	BHP	PHASE	VOLT	FLA	DISCHARGE VELOCITY	WEIGHT (LBS)	ZONE(S)
1	EXT-1	1	AH-GI1836XFA	ADVANCED HOOD	2475	1.000	1077	DDP/PROM	1.500	0.8750	3	208	4.6	572 FPM	178	11.8

DOAS/RTU FAN SCHEDULE — JOB#8263018

FAN NO.	TAG	QTY	DOAS/RTU MODEL #	MANUFACTURER	BLOWER	AIR INFORMATION: RETURN AIR CFM	MIN OUTSIDE AIR CFM	TOTAL CFM	WEIGHT (LBS)	ESP	ELECTRICAL INFORMATION: HP	PHASE	VOLT	MCA	MOCP	COOLING INFORMATION: OUTSIDE AIR DB	OUTSIDE AIR WB	LEAVING AIR DB	LEAVING AIR WB	CAPACITY: TOTAL TONS	TOTAL MBH	EER	SHR(%)	HEATING INFORMATION: DISCHARGE AIR DB	HEATING MBH	MINIMUM TURNDOWN (MBH)	GAS INFORMATION: GAS TYPE	GAS LINE	INPUT BTUH	OUTPUT BTUH	EFF. %	REQUIRED INPUT GAS PRESSURE	AIR MINIMUM ROOM VOLUME: MAKE-UP AIR CFM	RETURN AIR CFM	TOTAL CFM	NOTES
2	DOAS-1	1	AHRTU3-I.150-15-15T-DOAS	ADVANCED HOOD	15P-3	0	2200	2200	2425	1.000	2.00	3	460	28.44	30A	88.4°F	76.7°F	53.5°F	52.0°F	50.9°F	204.7	448.8	81.2	48%	75.0°F	58.0°F	34.5 MBH	29.8 MBH	NATURAL	140,000	129999	88%	7" IN. W.C. – 14 IN. W.C.	572.7	1031	7.2	2,3,5,6,5,7,8,9,10,11,12,13,14,15,16,17

NOTES:
1. SCREW SCROLL COMPRESSOR WITH INTEGRATED OIL SENSOR. DIGITAL OR STAGED SCROLL NOT AN APPROVED EQUAL
2. DIRECT DRIVE PLENUM BLOWERS. BELT DRIVEN BLOWERS ARE NOT ACCEPTABLE
3. REFRIGERANT PIPING: TYPE L CECULAR CONNECTION BY MANUFACTURER
4. REFRIGERATION PRESSURE SWITCHES: ON THE HIGH PRESSURE SIDE OF SYSTEM INCLUDED THROUGH DIGITAL INTERFACE
5. ELECTRONIC EXPANSION VALVE - TXV NOT ACCEPTABLE
6. ELECTRONIC EXPANSION VALVE - TXV NOT ACCEPTABLE
7. SUCTION LINE ACCUMULATOR
8. ALL REFRIGERANT COMPONENTS HAVE 5 YEAR PARTS WARRANTY, 25 YEAR WARRANTY ON STAINLESS STEEL HEAT EXCHANGER
9. REFRIGERANT PIPING, EVAP AND DISCHARGE TEMPERATURE SENSORS (DISCHARGE SENSOR TO BE FACTORY MOUNTED WITH UNIT)
10. 2" EXTERIOR DUAL WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 14GA SKID
11. 2" INTERIOR DUAL WALL CONSTRUCTION W/ R-13 INSULATION-MINIMUM 20GA EXTERIOR W/ 16GA SKID. EXCEEDS FIRING RANGE, 4:1 TURNDOWN WITH NO AND 5:1 TURNDOWN WITH LP
12. DUCT SIZE MONITORING INTERFACE TO UNIT WITH CFM MEASUREMENT INCLUDED THROUGH DIGITAL INTERFACE
13. 15 DEGREE LOW AMBIENT OPERATION
14. 15 DEGREE LOW AMBIENT OPERATION
15. MINIMUM ROOM AREA ASSUMED 7.5' SUPPLY DIFFUSER HEIGHT AND IS CALCULATED PER UL8535-2-40 4TH ED. VALUES BASED ON FACTORY CHARGE, ACTUAL SITE CHARGE MAY DIFFER.
16. 2" SLOPE BOTTOM OF "DUMP"

FAN ACCESSORIES

FAN NO.	TAG	DOAS/RTU	EXHAUST			SUPPLY		
			DISCHARGE CLIP	GRAVITY DAMPER	WALL MOUNT	SIDE DISCHARGE	GRAVITY DAMPER	MOTORIZED DAMPER	WALL MOUNT
1	EXT-1	YES							

CURB ASSEMBLIES

NO	FAN NO.	TAG	R-VALUE	WEIGHT	ITEM	SIZE
1	#	EXT-1		34 LBS	CURB	28.500"W x 28.000"L x 24.000"H - VENTED - HINGED.
2	#	DOAS-1	4.2	130 LBS	CURB	126.500"W x 91.000"L x 20.000"H - INSULATED

1" #4.3 FOIL FACED FIBERGLASS INSULATION. COMPLIES WITH UL/ULC/ASTM, & ASHRAE STANDARDS.

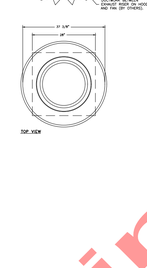
Property of JY Engineers

FAN OPTIONS

FAN NO.	QTY	DESCRIPTION
1	EXT-1	1 GREASE BOX
		1 FAN BASE CERAMIC SEAL – SILVERBOND® – INSTALLED AT PLANT – FOR GREASE DUCTS
		1 2 YEAR PARTS WARRANTY
		1 FAILT PRESSURE GAUGE, 0-25"
		1 MANITOLD PRESSURE GAUGE, 0 TO 10" WC, 1 FURNACE
		1 COOLING OVERRIDE
		SINGLE POINT ELECTRICAL CONNECTION FOR RTU, 150VA TRANSFORMER USED, 9" X NON-DEV SHEET METAL BASE WITH 1" RIGID CONDUIT STUB UP, 24VAC POWER OPTION, MUST BE SELECTED, DOES NOT PROVIDE EXPELT STARTER IN PACKAGE
		1 RTU BLOWER DOOR SWITCH
		1 2" MERV 13 FILTERS FOR RTUS (QTY. 4)
		1 2" MERV 8 FILTERS FOR RTUS (QTY. 4)
		1 OVERHEAT STAT
		1 TOTAL CFM MONITORING
		1 RTU FACTORY MOUNTED AND WIRED IN RTU COMMERCIAL CONTROL VESTIBULE
		1 15 TON MODULATING COOLING OPTION, R401A/B/D, R454B REFRIGERANT, VARIABLE SPEED COMPRESSOR, MODULATING HOT GAS
		1 FREON LEAK DETECTOR OPTION FOR RTUS
		1 LOW AMBIENT COOLING OPERATION – DOWN TO 0° AMBIENT
		1 RTU FIXED 100% OA MIXING CONTROL
		1 RTUS CURB DUCT HANGER
2	DOAS	1 SMV PACKAGE W/ MINUALTOC CONTROL (S71 MFD INCLUDED)
		1 LOAD REACTOR MOUNTED IN FAN
		1 COMMERCIAL SMOKE DETECTOR/ALARM INTERLOCK – ALARM SUPPLIED BY OTHERS
		1 OCCUPIED SCHEDULING
		1 DIRTY FILTER ALARM – NOTIFICATION ON HMI
		1 RTUS CONVENIENCE OUTLET (GFCI), 15 AMP – REQUIRES SEPARATE 120V CONNECTION, INCLUDES RECEPTACLE, COVER AND J-BOX
		1 INTAKE FIRESTAT SET TO 135°F
		1 FREEZESTAT
		1 EXHAUST FIRESTAT SET TO 240°F
		1 CYCLONE BUILDING MONITORING SYSTEM – INTERNET OR CELLULAR CONNECTION REQUIRED
		1 15 TON MODULATING REHEAT OPTION – SPACE DEWPOINT CONTROL – R454B
		1 RTUS NO RETURN – 100% OA
		1 2" METAL MESH FILTERS FOR RTUS OUTDOOR INTAKE
		1 5 YEAR COMPRESSOR PARTS WARRANTY, 10 YEAR ALUMINUM UNIT PARTS WARRANTY WITH REMOTE MONITORING, 25 YEAR WARRANTY ON STAINLESS STEEL PLENUM & HEAT EXCHANGER PARTS WARRANTY (SEE ADDITIONAL DETAILS)
		1 OUTDOOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET

HMI SCHEDULE				
UNIT NUMBER	HMI #	HMI LOCATION	TEMP AVERAGING	INTERIOR ACCESS
FAN #1	HMI #1 = UNIT	IN UNIT	NOT AVERAGED	YES
FAN #1	HMI #1 = SPACE		AVERAGED	NO

(ON #1 AH-GI1836XFA – EXHAUST FAN (EXT-1))



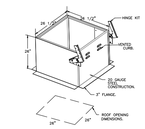


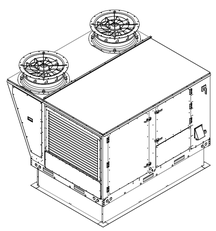
FEATURES:
- DIRECT DRIVE CONSTRUCTION (NO BELTS/PULLEYS).
- ROOF MOUNTED TYPE.
- ULTRA LOW NOISE.
- ULTRA EFF. ULTRA MID SIZE ECM.
- 1" RIGID CURB (STEEL).
- INTERNAL WIRING.
- 115V, 1PH, 60HZ MOTOR PROTECTION (SINGLE PHASE).
- HIGH HEAT OPERATING SOFT START).
- CANADA CLASSIFICATION TESTING.
- MAIN DISCONNECT SWITCH.

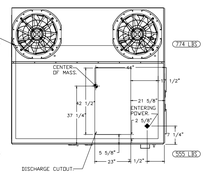
NORMAL TEMPERATURE: 200°
ROOF MOUNTED EXHAUST FAN CONTINUOUSLY RATED OPERATING AIR AT 400°F (204°C) FOR A MINIMUM OF 15 MINUTES WITH THERMAL DISCONNECT, AND WITHOUT ANY MECHANICAL DAMAGE TO THE FAN WHEEL OR HOUSING SHOULD CAUSE GREASE OPERATION.

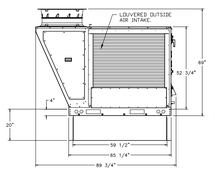
OPTIONAL FLAME-UP 300°
ROOF MOUNTED EXHAUST FAN CONTINUOUSLY RATED OPERATING AIR AT 300°F (149°C) FOR A MINIMUM OF 15 MINUTES WITH THERMAL DISCONNECT, AND WITHOUT ANY MECHANICAL DAMAGE TO THE FAN WHEEL OR HOUSING SHOULD CAUSE GREASE OPERATION.

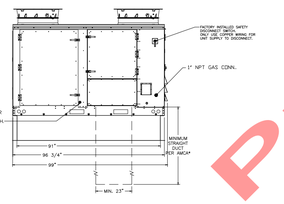
OPTIONS
- GREASE BOX.
- 1" RIGID CURB (STEEL) – CUSTOM BOXES
- 5 YEARS OF PLUS 5 YEARS ON ENGINE
- 2 YEARS OF PLUS 3 YEARS WARRANTY.

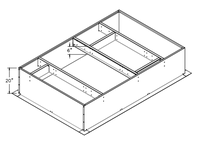


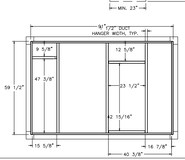


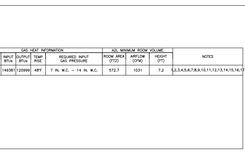












FAN #2 AHRTU3-I.150-15-15T-DOAS – HEATER (DOAS-1)

NOTES:
1. DO NOT OBSTRUCT OUTSIDE AIR INLET, OUTSIDE AIR COIL OR OUTSIDE AIR FAN.
2. ( ) DENOTES CORNER WEIGHT.
3. ROOF OPENING MUST BE 2" SMALLER THAN CURB DIMENSIONS IN BOTH DIRECTIONS.
4. CONNECTION FROM BREAKER TO UNITS SAFETY DISCONNECT SWITCH TO BE COPPER WIRE ONLY.
5. EXTERIOR GAS CONNECTION PROVIDED BY FACTORY WITH QUICK SEAL AND ANTI-ROTATION BRACKET.

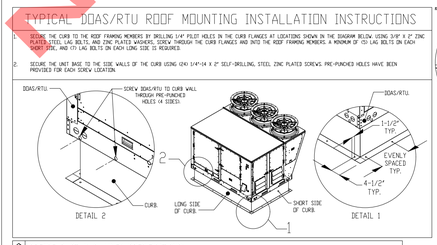
*NOTE: INTEGRAL CO2 MONITORING AND CONTROL CAPABILITIES FOR ALL SPACE MOUNTED THERMOSTATS.

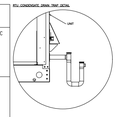
***NOTE: THIS UNIT IS INTENDED TO SERVE IN PLACE OF THE KITCHEN HVAC ROOF TOP UNIT (RTU) IN ADDITION TO PROVIDING APPROPRIATE MAKE-UP AIR FOR THE KITCHEN HOOD(S). RTU AND ASSOCIATED DUCTWORK SHALL BE REMOVED FROM SCOPE UNLESS REQUIRED FOR INTERNAL LOAD ESTIMATES. FINAL DESIGN SHALL BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD.**

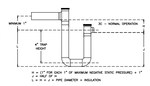
*NOTE: SUPPLY DUCT MUST BE INSTALLED TO MEET SMACNA STANDARDS. A MINIMUM STRAIGHT DUCT LENGTH MUST BE MAINTAINED DOWNSTREAM OF UNIT DISCHARGE AS OUTLINED IN AMCA PUBLICATION 201. WHEN USING RECTANGULAR DUCTWORK, ELBOWS MUST BE RADIUS THROAT, RADIUS BACK WITH TURNING VANES. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECT WHICH SIGNIFICANTLY INCREASES STATIC PRESSURE IN THE DUCTWORK WILL CAUSE SYSTEM EFFECT. SYSTEM EFFECT WILL SIGNIFICANTLY INCREASE STATIC PRESSURE AND REDUCE AIRFLOW. DO NOT RELY ON UNIT TO SUPPORT DUCT IN ANY WAY. FAILURE TO PROPERLY SIZE DUCTWORK MAY CAUSE SYSTEM EFFECTS AND REDUCE PERFORMANCE OF THE EQUIPMENT. SUGGESTED SUPPLY STRAIGHT DUCT SIZE IS 23" x 39".

TYPICAL DOAS/RTU ROOF MOUNTING INSTALLATION INSTRUCTIONS

1. LOCATE THE CURB TO THE ROOF FRAMING MEMBERS BY DRILLING 1/4" PILOT HOLES IN THE CURB FLANGES AT LOCATIONS SHOWN IN THE DIAGRAM BELOW. USING 3/8" X 2" ZINC PLATED BOLTS, LAG BOLTS, AND ZINC PLATED WASHERS, SCREW THROUGH THE CURB FLANGES AND INTO THE ROOF FRAMING MEMBERS. A MINIMUM OF TEN LAG BOLTS ON EACH SHORT SIDE, AND TEN LAG BOLTS ON EACH LONG SIDE IS REQUIRED.
2. SECURE THE UNIT BASE TO THE SIDE WALLS OF THE CURB USING (24) 1/4"-14 X 2" SELF-DRILLING, STEEL ZINC PLATED SCREWS. PRE-PUNCHED HOLES HAVE BEEN PROVIDED FOR EACH SCREW LOCATION.







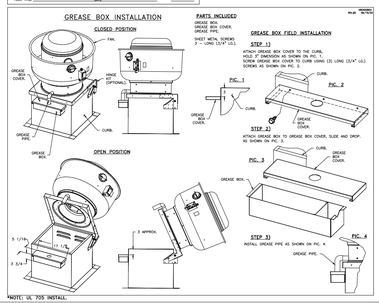
GREASE DUCT & CHIMNEY SPECIFICATIONS:
PROVIDE GREASE DUCT EQUAL TO ADVANCED HOOD SYSTEMS, LLC MODEL "DW" ROUND 20 GAUGE 430 STAINLESS STEEL DUCTWORK. MODEL "DW" IS LISTED TO UL-1978 AND IS INSTALLED USING "V" CLAMP LOCKING CONNECTIONS SEALED WITH 3M FIRE BARRIER 2000 PLUS. MODEL "DW" DOES NOT REQUIRE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

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

CUSTOMER APPROVAL TO MANUFACTURE:

APPROVED AS NOTED ☐
APPROVED WITH NO EXCEPTION TAKEN ☐
REVISE AND RESUBMIT ☐
SIGNATURE _____
YOUR TITLE _____ DATE _____

GREASE BOX INSTALLATION



PARTS INCLUDED
GREASE BOX
GREASE BOX COVER.
GREASE PIPE.
SHEET METAL SCREWS
3 – LONG (3/4" LG.)

GREASE BOX FIELD INSTALLATION

STEP 1)
ATTACH GREASE BOX COVER TO THE CURB, USING (3) LONG (3/4" LG.) SHEET METAL SCREWS. SCREW GREASE BOX COVER TO CURB USING (3) LONG (3/4" LG.) SCREWS AS SHOWN ON PIC. 2.

STEP 2)
ATTACH GREASE BOX TO GREASE BOX COVER, SLIDE AND DROP, AS SHOWN ON PIC. 3.

STEP 3)
INSTALL GREASE PIPE AS SHOWN ON PIC. 4.

*NOTE: UL 705 INSTALL

FLAME BROILER

HOOD DETAILS (02 OF 04)

M505

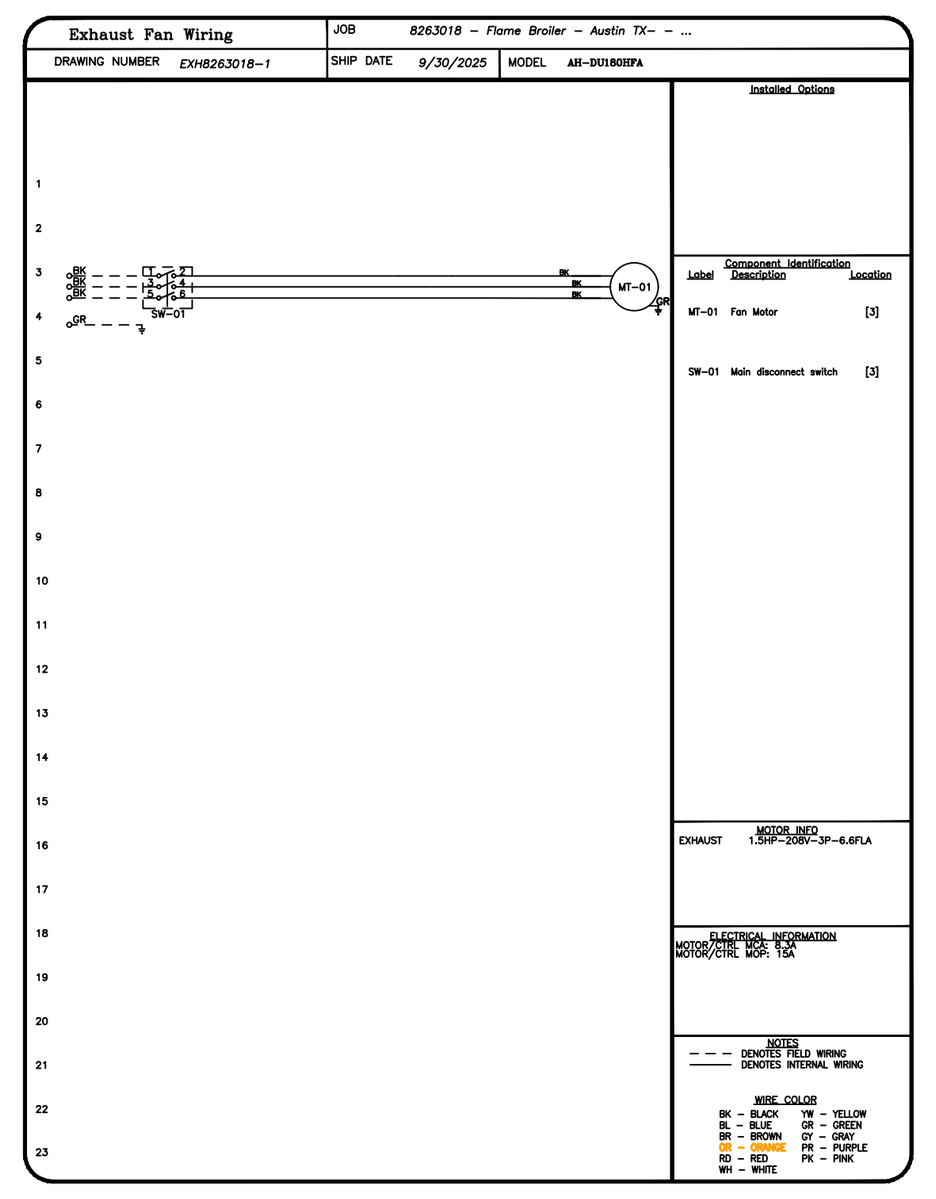
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ADVANCED HOOD SYSTEMS

Advanced Hood Systems, LLC
FL PHONE: 786.953.1333 | EMAIL: info@advancedhoodsystems.com
1111 KENNEDY DRIVE, KEY WEST, FLORIDA 33040 | WWW.ADVANCEDHOODSYSTEMS.COM

DATE: 9/30/2025
DWG.#: 8263018
DRAWN BY: SPG'-140
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO. 5 | 6 | 7 | 8

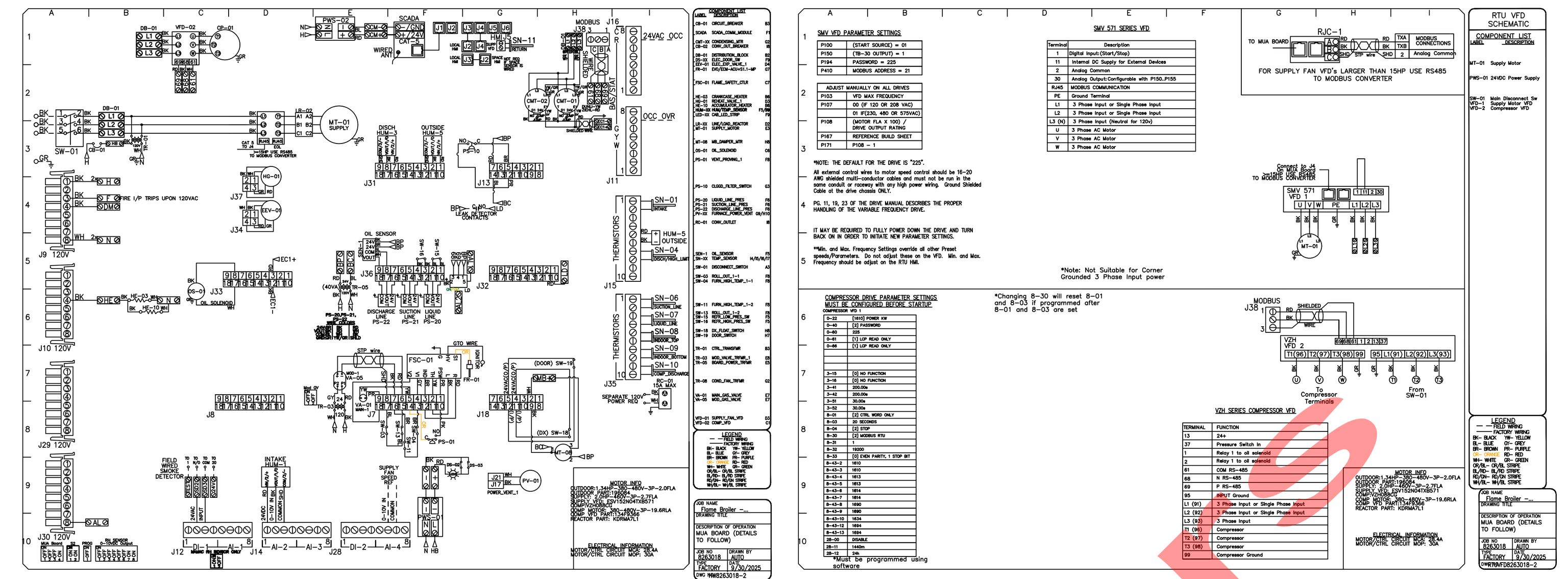


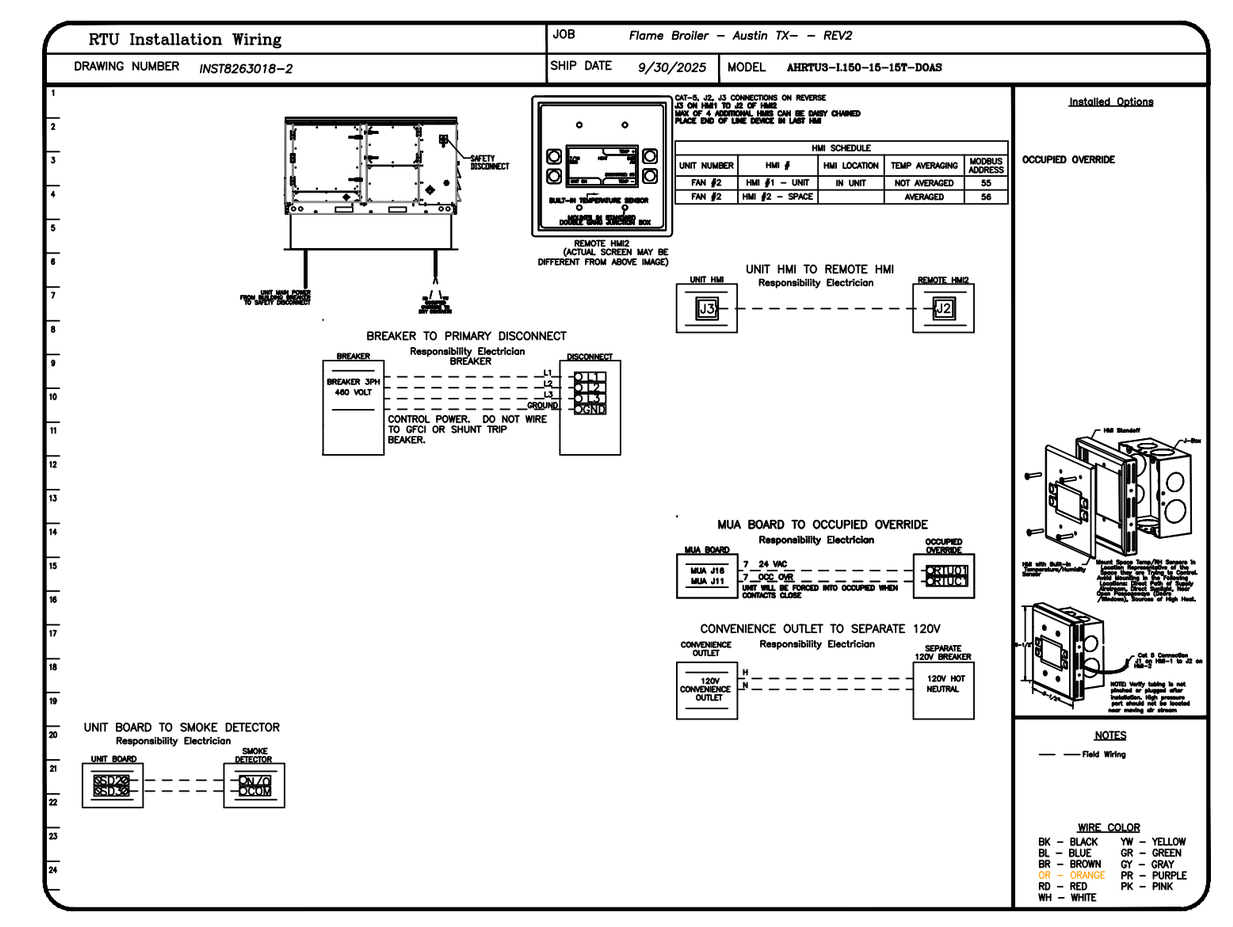
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Advanced Hoods Systems, LLC
HOOD SYSTEMS
., FL. PHONE: FAX: 9192275974 EMAIL: nescobar@advancedhoodsystems.com

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DWG.#: 8263018
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SCALE: 3/4" = 1'–0"
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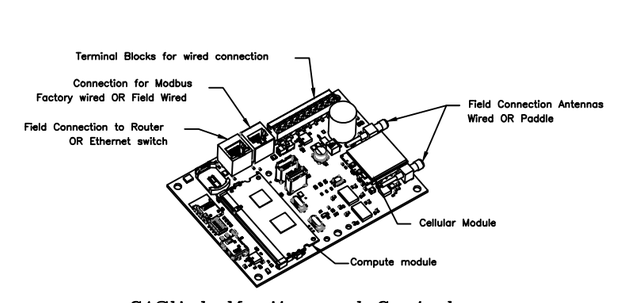
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ELECTRICAL PACKAGE – JOB#8263018

NO	TAG	PACKAGE #	LOCATION	SWITCHES LOCATION	SWITCHES QUANTITY	OPTION	FANS CONTROLLED TYPE	Φ	HP	VOLT	FLA
1		DCV–1111	WALL MOUNT IN SS BOX	SS WALL MOUNT BOX	1 LIGHT 1 FAN	SMART CONTROLS DCV	EXHAUST	3	0.250	208	1.2
							SUPPLY	3	0.250	208	1.2



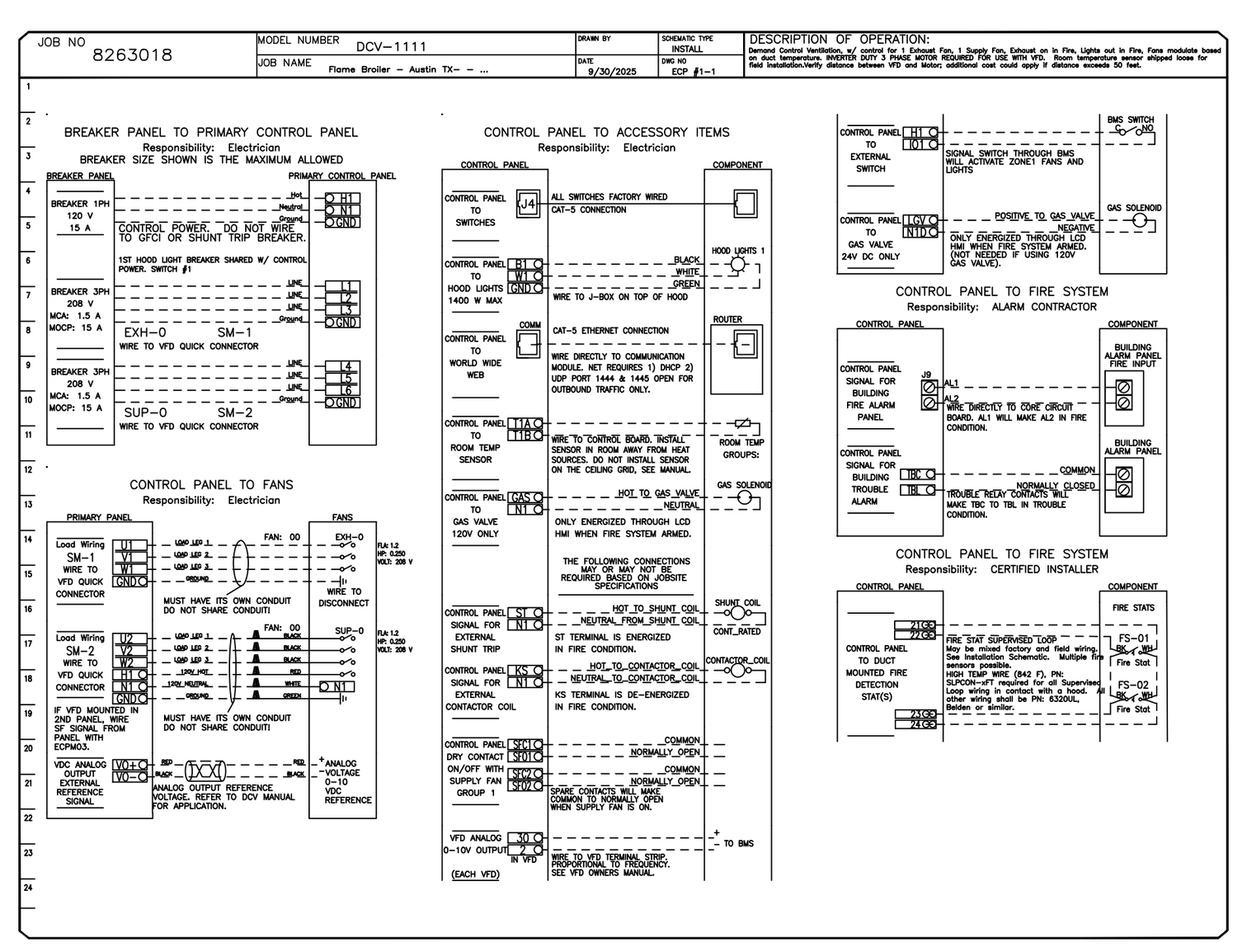
CASlink Monitor and Control

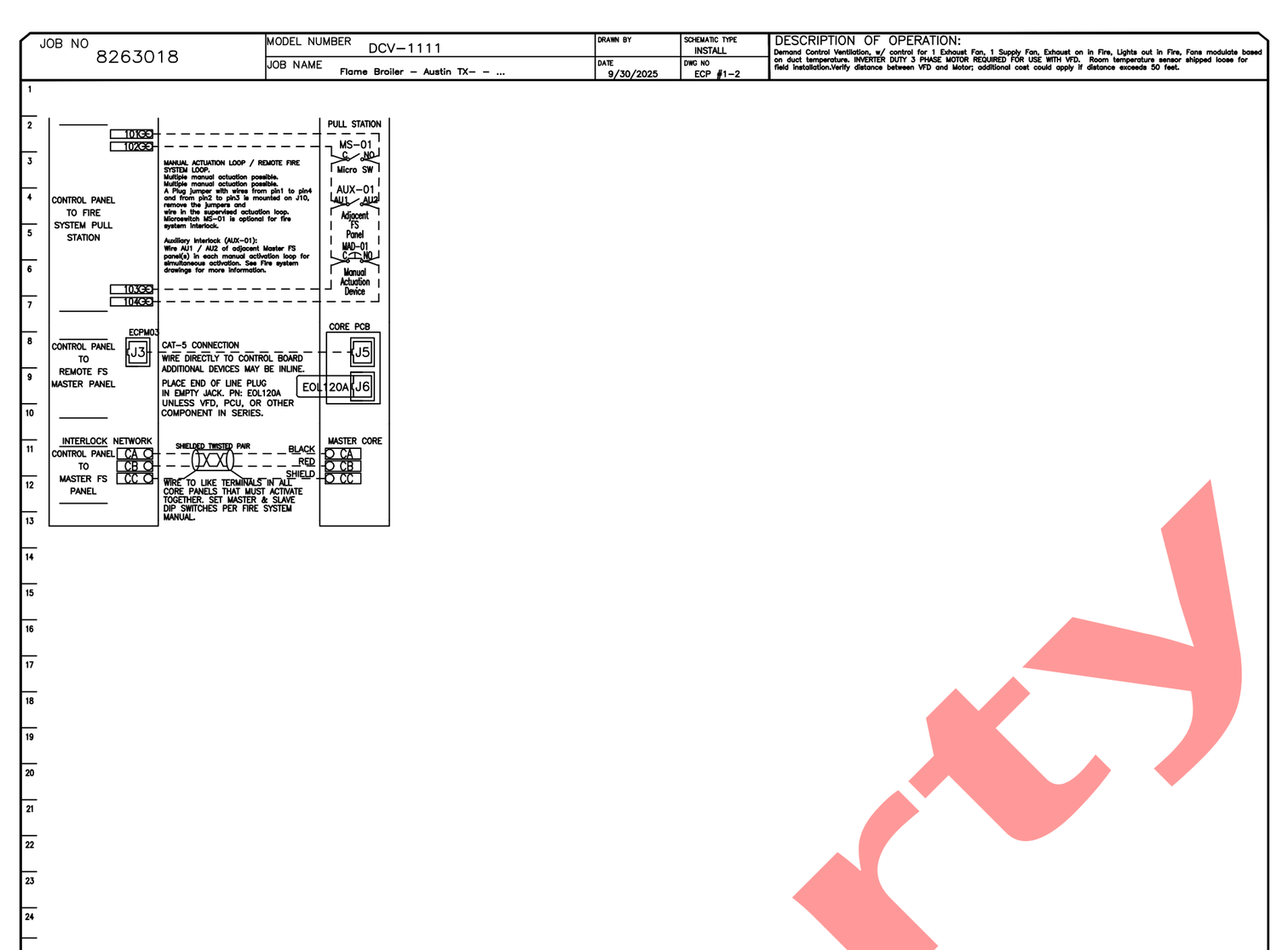
– Hood control panel to support communications to cloud-based Building Management System.
– Hood Control Panel to allow cloud-based Building Management System to monitor real time parameters outlined as MONITOR in the points list.
– Hood Control Panel to allow cloud-based Building Management System to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

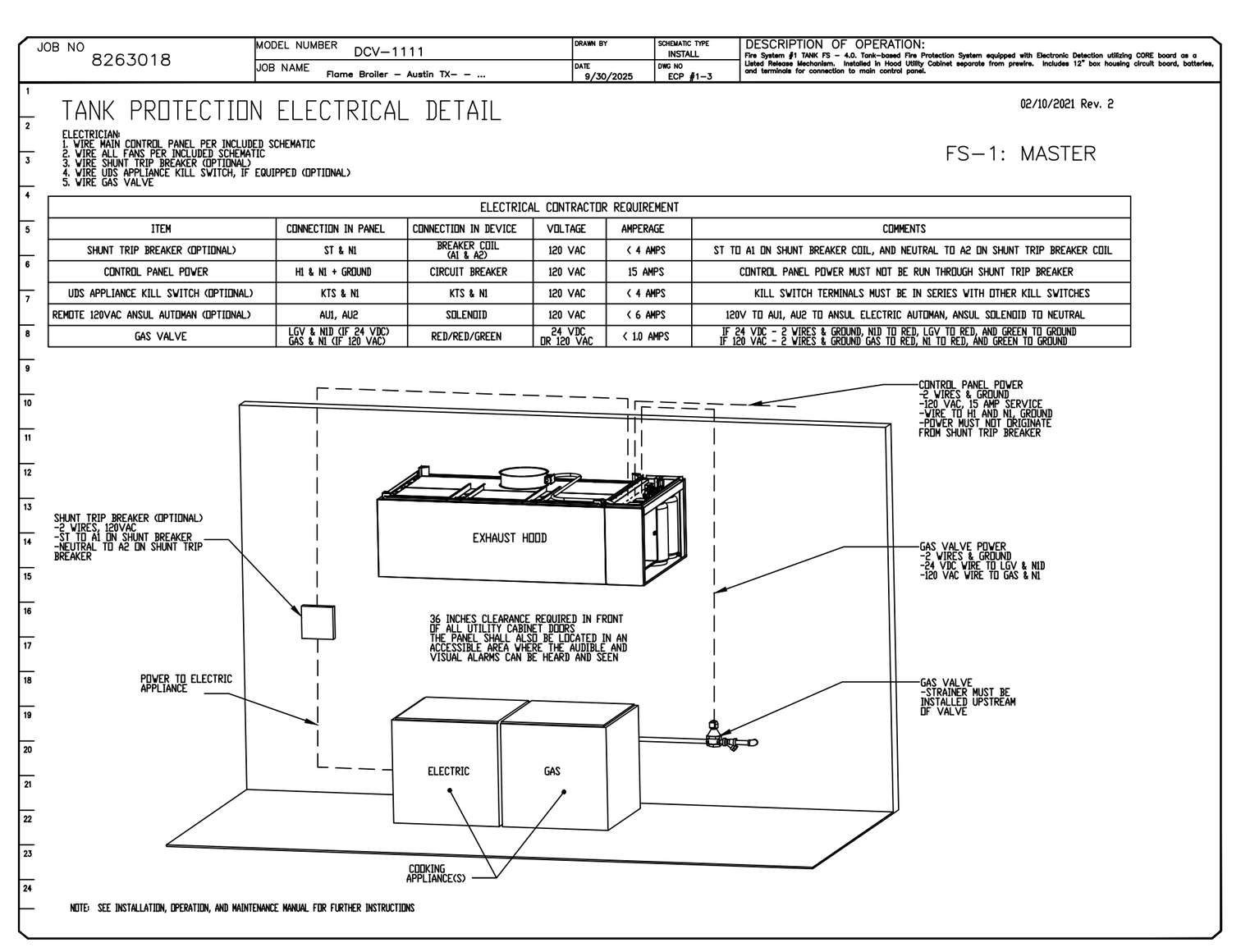
MONITORING AND CONTROL POINTS LIST

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

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



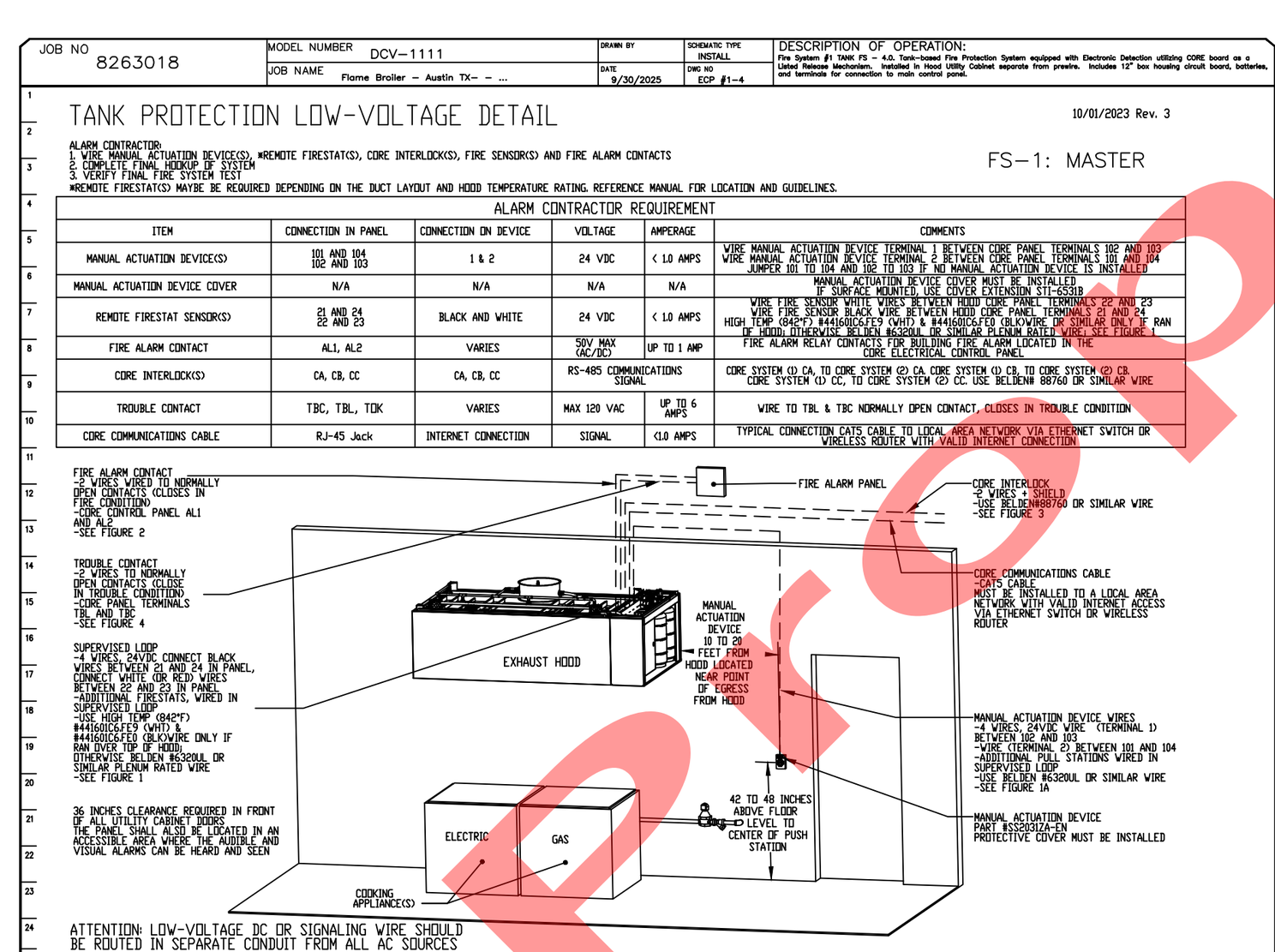




ELECTRICIAN:
1. WIRE MAIN CONTROL PANEL PER INCLUDED SCHEMATIC
2. WIRE ALL FANS PER INCLUDED SCHEMATIC
3. WIRE SHUNT TRIP BREAKER (OPTIONAL)
4. WIRE UDS APPLIANCE KILL SWITCH, IF EQUIPPED (OPTIONAL)
5. WIRE GAS VALVE

ELECTRICAL CONTRACTOR REQUIREMENT

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



ALARM CONTRACTOR:
1. WIRE MANUAL ACTUATION DEVICE(S), #REMOTE FIRESTAT(S), CORE INTERLOCK(S), FIRE SENSOR(S) AND FIRE ALARM CONTACTS
2. COMPLETE FINAL HOOKUP OF SYSTEM
3. VERIFY FINAL FIRE SYSTEM TEST
#REMOTE FIRESTAT(S) MAYBE BE REQUIRED DEPENDING ON THE DUCT LAYOUT AND HOOD TEMPERATURE RATING. REFERENCE MANUAL FOR LOCATION AND GUIDELINES.

ALARM CONTRACTOR REQUIREMENT

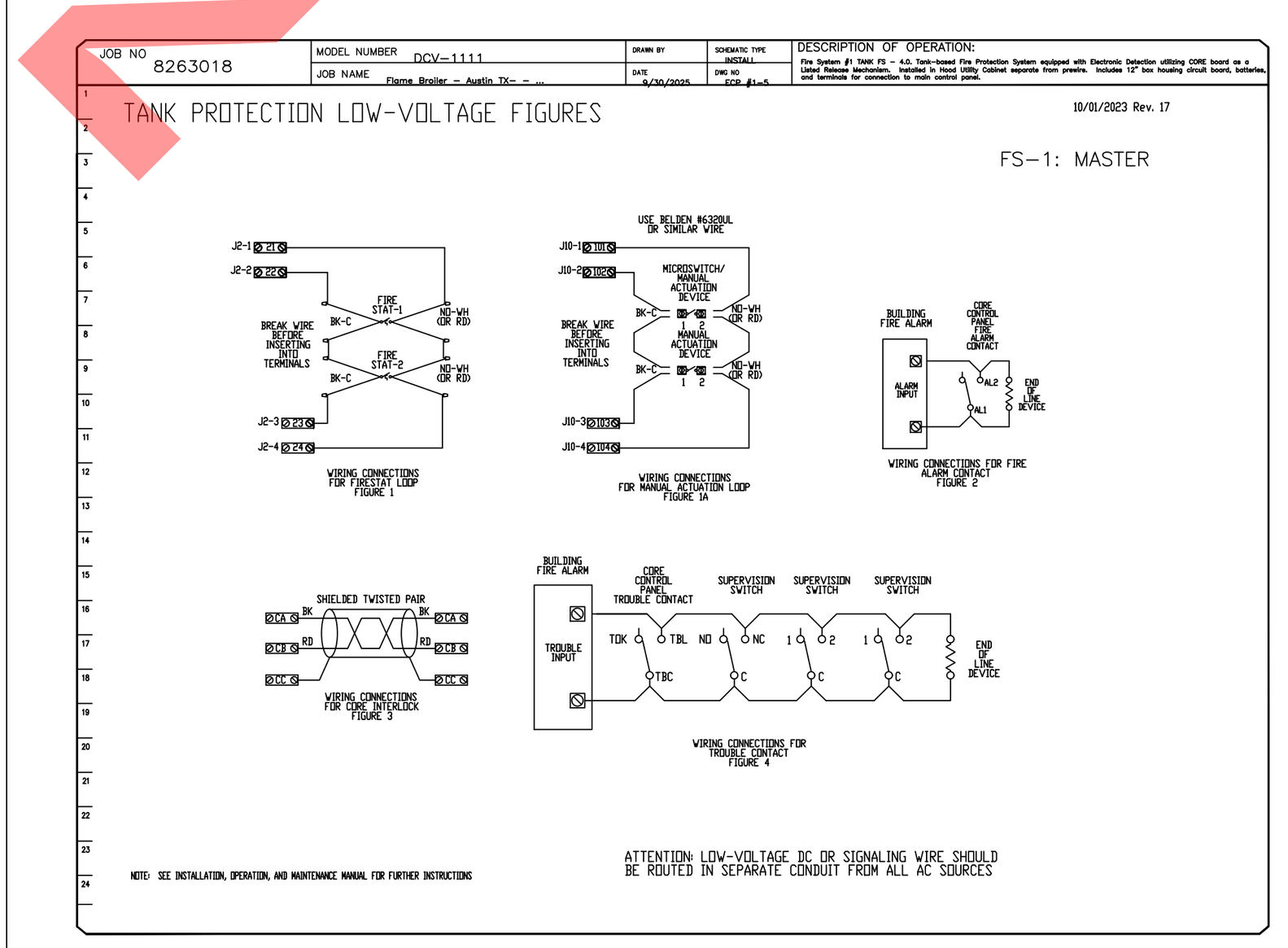
ITEM	CONNECTION IN PANEL	CONNECTION IN DEVICE	VOLTAGE	AMPERAGE	COMMENTS
MANUAL ACTUATION DEVICE(S)	101 AND 104 102 AND 103	1 & 2	24 VDC	< 1.0 AMPS	WIRE MANUAL ACTUATION DEVICE TERMINAL 1 BETWEEN CORE PANEL TERMINALS 102 AND 103 WIRE MANUAL ACTUATION DEVICE TERMINAL 2 BETWEEN CORE PANEL TERMINALS 101 AND 104 JUMPER 101 TO 104 AND 102 TO 103 IF NO MANUAL ACTUATION DEVICE IS INSTALLED
MANUAL ACTUATION DEVICE COVER	N/A	N/A	N/A	N/A	MANUAL ACTUATION DEVICE COVER MUST BE INSTALLED IF SURFACE MOUNTED, USE COVER EXTENSION STI–6530
REMOTE FIRESTAT SENSOR(S)	21 AND 24 22 AND 23	BLACK AND WHITE	24 VDC	< 1.0 AMPS	WIRE FIRE SENSOR WHITE WIRE BETWEEN HOOD CORE PANEL TERMINALS 22 AND 23 WIRE FIRE SENSOR BLACK WIRE BETWEEN HOOD CORE PANEL TERMINALS 21 AND 24 HIGH TEMP (842°F) [illegible]
FIRE ALARM CONTACT	AL1, AL2	VARIES	50V MAX (AC/DC)	UP TO 1 AMP	FIRE ALARM RELAY CONTACTS FOR BUILDING FIRE ALARM LOCATED IN THE CORE ELECTRICAL CONTROL PANEL
CORE INTERLOCK(S)	CA, CB, CC	CA, CB, CC	RS–485 COMMUNICATIONS SIGNAL		CORE SYSTEM (1) CA, TO CORE SYSTEM (2) CA, CORE SYSTEM (1) CB, TO CORE SYSTEM (2) CB, CORE SYSTEM (1) CC, TO CORE SYSTEM (2) CC. USE BELDEN 88760 OR SIMILAR WIRE
TROUBLE CONTACT	TBC, TBL, TDK	VARIES	MAX 120 VAC	UP TO 6 AMPS	WIRE TO TBL & TBC NORMALLY OPEN CONTACT, CLOSES IN TROUBLE CONDITION
CORE COMMUNICATIONS CABLE	RJ–45 Jack	INTERNET CONNECTION	SIGNAL	<1.0 AMPS	TYPICAL CONNECTION CAT5 CABLE TO LOCAL AREA NETWORK VIA ETHERNET SWITCH OR WIRELESS ROUTER WITH VALID INTERNET CONNECTION

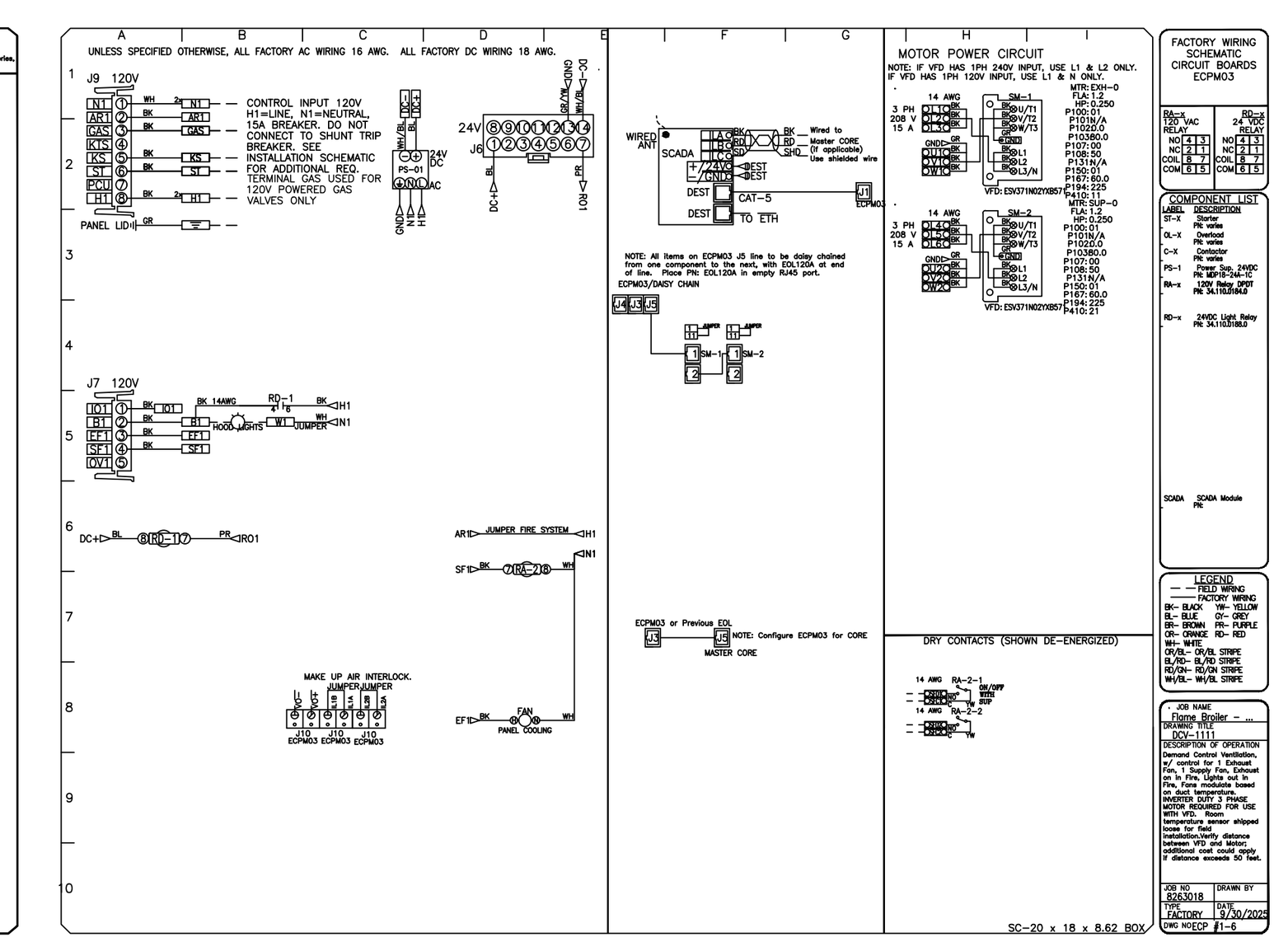
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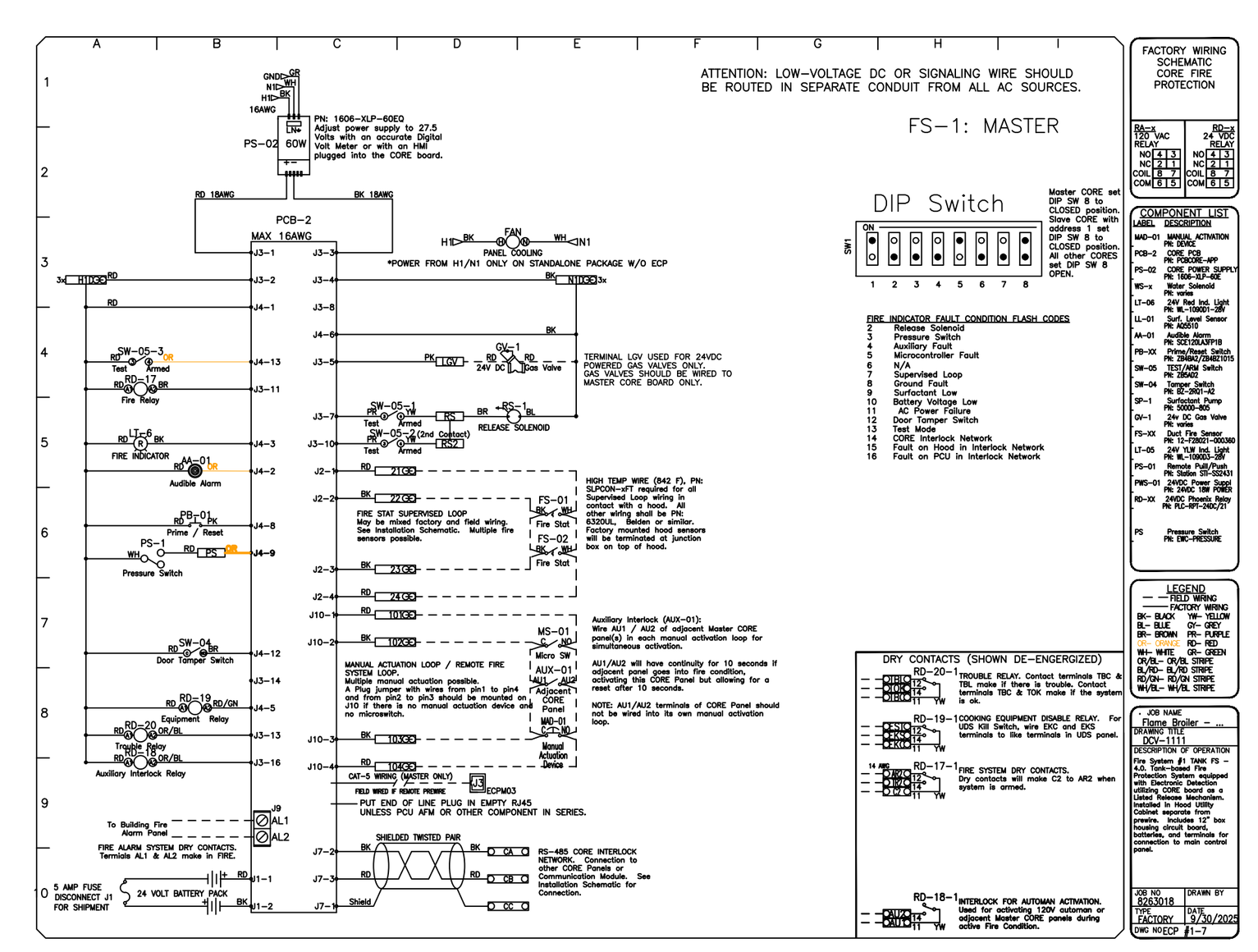
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Advanced Hoods Systems, LLC
HOOD SYSTEMS
., FL. PHONE: FAX: 9192275974 EMAIL: nescobar@advancedhoodsystems.com

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Property of NY Engineers

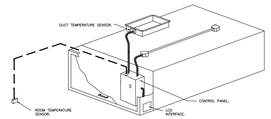
FLAME BROILER

HOOD DETAILS(03 OF 04

M506

DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROLS SHALL BE LISTED BY ETL (UL 508A) AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURNDOWN REQUIREMENTS OUTLINED IN ECC 403.7.5 (2021).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBE(S) LOCATED IN THE EXHAUST DUCT RISER(S) SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A FIXED DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURES SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IMC 507.1.1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCES HAVE BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFDS) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFDS BETWEEN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 0% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AFTER COOKING OPERATIONS HAVE COMPLETED; OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FAN(S), ACTIVATE THE EXHAUST FAN(S), ACTIVATE THE APPLIANCE SHUNT TRIP, AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COVERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL BMS FAN CONTROL VIA DRY CONTACT (EXTERNAL CONTROL SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE).
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
  A. ON/OFF SWITCH FOR EACH FAN (HAND-OFF-AUTO).
  B. DESIGNATED DUB VALVE RELAY FOR ELECTRONIC GAS VALVES (NO RESET RELAY REQUIRED).
  C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  E. MS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
  F. A SINGLE LOW VOLTAGE CAT-5 RJ45 WIRING CONNECTION.
  G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KWH FROM THE VFDS.



TYPICAL HOOD CONTROL PANEL INSTALLATION

SEQUENCE OF OPERATIONS:
THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME:

- AUTOMATIC: THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD CANTY OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD, DEPENDING ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE SPEED FAN IS USED. A FAN ZONE DEFINED AS "STATIC" WILL RUN AT A SET SPEED. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DEFINED AS "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DEFINED AS "STATIC", FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN ECC 403.7.5 (2021).
- MANUAL: THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
- SCHEDULE: A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATION MODE AND FOLLOW THE FAN PROCEDURE ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. SCHEDULE MODE CAN BE USED TO ENSURE THAT THE SYSTEM IS NOT UNINTENTIONED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER: THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARD-WIRED INTERLOCK).
- FIRE: UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO TO RUN, THE HOOD MAKEUP AIR WILL SHUTDOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUNT TRIP BREAKER PROVIDED BY THE ELECTRICIAN. FUEL GAS WILL SHUT OFF VIA A MECHANICAL/ELECTRICAL GAS VALVE ACTUATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

SYSTEM DESIGN VERIFICATION (SDV)

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

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

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

REVISIONS	
DESCRIPTION	DATE

FLAME BROILER
HOOD SYSTEMS
FL, PHONE: 800.695.4911 FAX: 800.695.4912 EMAIL: sales@flamebroiler.com

DATE: 9/30/2025

DWG.#: 8253018

DRAWN BY: SPD'-140

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

MASTER DRAWING

SHEET NO. 13

Property of NY Engineers

FLAME BROILER

HOOD
DETAILS(04 OF 04)

M507

ROOF TOP UNIT SCHEDULE

UNIT ID	MANUFACTURER	EFFICIENCY	MODEL	AREA SERVED	NOMINAL TONS	REFRIGERANT	SUPPLY FAN			GAS HEAT		COOLING				STAGES	ELECTRICAL				EER2	SEER2/IEER	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)		VOLTS	PHASE	MCA(A)	MOCP(A)				
RTU-1	TRANE	HIGH	YHK060A4S0	SEE PLAN	5.0	R-454B	2000	500	1.0	80	64.8	61.42	48.19	100	75.1/61.8	2	460	3	17	20	12.2	16.4	1160	1-14

NOTES / ACCESSORIES :

1. ALL EQUIPMENT MUST BE HIGH EFFICIENT, MEETING OR EXCEEDING THE BRANDS MINIMUM REQUIREMENTS.
2. ELECTRICAL CONNECTION TO BE SINGLE POINT AND TO BE THROUGH THE BOTTOM OF THE UNIT.
3. PROVIDE DISCONNECT SWITCH AND AN UNPOWERED GFIC RECEPTACLE.
4. CONDENSATE DRAIN WITH 2" DEEP VENTED TRAP DISCHARGE TO MOP SINK DRAIN WITH AIR GAP FITTINGS.
5. UNIT SHALL BE COMPLETE WITH GAS HEATING SECTION. GAS REGULATOR TO RECEIVE (4.5-14)" GAS PRESSURE FROM MAIN.
6. PROVIDE 8-WIRE, 24 VAC, AUTOMATIC CHANGEOVER, 2-STAGE HEAT / COOL, REMOTELY PROGRAMMABLE THERMOSTAT.
7. REMOTE SENSORS SHALL BE PROVIDED IN RETURN DUCT & WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.
8. ANTI SHORT CYCLE TIMER.
9. THROWAWAY 2" FILTERS (MERV 8).
10. PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
11. VFD SUPPLY FAN.
12. PROVIDE HOT GAS REHEAT WITH ASSOCIATED CONTROLS AND SENSORS FOR DEHUMIDIFICATION CONTROL.
13. WHERE REQUIRED, PROVIDE LOW AMBIENT COOLING CAPABILITY DOWN TO 0 DEGREES F.
14. ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF / 25% MANUAL OUTSIDE AIR DAMPER ASSEMBLY WITH HOOD. PROVIDE FDD.

AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1	SEE PLAN	2000	500	1500	-
DOAS-1	KITCHEN	-	2200	0	-
KEF-1	HOOD-1	-	-	-	2475 CFM
EF-1	SEE PLAN	-	-	-	140 CFM
EF-2	SEE PLAN	-	-	-	50 CFM
TOTAL:		2000 CFM	2700 CFM	1500 CFM	2665 CFM
BUILDING PRESSURE:		.....		35 CFM	**POSITIVE**

VENTILATION CALCULATION

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER UMC 2024	NUMBER OF PEOPLE AS PER UMC 2024	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER UMC 2024		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					
DINING AREA	422	70	30	30	7.5	0.18	301	500	0	0	0
WOMEN'S RESTROOM	56	0	0	0	0	0	0		70	70	70
VESTIBULE	35	0	0	0	0	0.06	2		0	0	0
MEN'S RESTROOM	56	0	0	0	0	0	0		70	70	70
SERVICE AREA	140	15	3	3	7.5	0.12	39	2200	0	0	0
OFFICE	33	5	1	1	5	0.06	7		0	0	0
KITCHEN	588	20	12	12	7.5	0.12	161		0.7	412	2475
MOP SINK	-	-	-	-	-	-	-		-	50	50
TOTAL	1330	-	-	46	-	-	349	2700	-	-	2665

HOODS

UNIT ID	MANUFACTURER	LENGTH (FEET-INCH)	MODEL	SERVICE	EXHAUST AIRFLOW (CFM)	EXHAUST COLLAR (INCH)	CONSTUCTION	WEIGHT (LBS)
HOOD-1	ADVANCE HOOD	9'	5424 AH-ND-2	KITCHEN	2475	23"X10"	430 STAINLESS STEEL	450

NOTES:

1. INSTALL HOOD AS PER MANUFACTURER'S RECOMMENDATION. REFER TO HOOD DRAWINGS FOR SPECIFICATIONS AND MORE DETAILS. SCHEDULES SHOWN FOR REFERENCE ONLY.
2. PROVIDE DRY CONTACT FOR HOOD FIRE SUPPRESSION SYSTEM & ANSUL SYSTEM.
3. CONNECT TO BUILDING MAIN FIRE ALARM PANEL FOR ALARM INITIATING SWITCH.
4. COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER SUPPLY AND INTEGRATION.
5. INCLUDE HOOD CONTROLLER WITH CONTROL PANEL FOR CONTROL OF HOOD, EXHAUST FAN. THE CONTROLLER SHOULD INTEGRATE AND CONTROL KITCHEN EXHAUST FAN AND UNITS CONNECTED TO HOOD.

DOAS UNIT SCHEDULE - GAS HEAT

MARK	MANUFACTURER	MODEL	SERVICE	COOLING DATA						HEATING DATA				FAN		MAU ELECTRICAL DATA			MAX WEIGHT
				ENTERING DBT /WBT DEG F	LEAVING DBT /WBT DEG F	TOTAL CAPACITY MBH	SENSIBLE CAPACITY MBH	IEER	ISMRE2	FUEL TYPE	INPUT CAPACITY MBH	OUTPUT CAPACITY MBH	STEADY STATE EFFICIENCY	AIR (CFM)	E.S.P (IN. W.G.)	V-P-H	MCA (A)	MOCP (A)	(LBS)
DOAS-1	ADVANCE HOOD	AHRTU3-I.150-15-15T-DOAS	SEE PLANS	88.4/79.7	53.5/52.0	204.7	80.2	18.8	8.3	NATURAL GAS	150	121	81%	2200	1.00	460-3-60	28.40	30.00	2450

NOTES/ACCESSORIES:

1. DOAS SHALL BE STANDARD EFFICIENCY
2. PROVIDE LOW LEAK ECONOMIZER WITH BAROMETRIC RELIEF. PROVIDE FDD.
3. ELECTRICAL CONNECTION TO BE SINGLE POINT AND TO BE THROUGH THE BOTTOM OF THE UNIT
4. PROVIDE UNIT MOUNTED NON-FUSED DISCONNECT SWITCH AND UN-POWERED CONVINIENCE OUTLET.
5. 14" ROOF CURB - CONTRACTOR SHALL FIELD INSULATE. SHIP ASAP AHEAD OF THE UNIT.
6. CABINET WITH 1/2" FIBERGLASS INSULATION.
7. PROVIDE 8-WIRE, 24 VAC, AUTOMATIC CHANGEOVER, 2-STAGE HEAT / COOL, REMOTELY PROGRAMMABLE THERMOSTAT.
8. REMOTE SENSORS SHALL BE PROVIDED IN SPACE WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.
9. ANTI SHORT CYCLE TIMER, CLOGGED FILTER SWITCH, CONDENSATE OVERFLOW SWITCH, FAN FAILURE SWITCH, HINGED ACCESS PANEL.
10. PROVIDE 2" FILTERS (MERV 8), COMPLETE COAT (MICRO CHANNEL CONDENSER COIL).
11. PROVIDE HOT GAS REHEAT WITH ASSOCIATED CONTROLS AND SENSORS FOR DEHUMIDIFICATION CONTROL.
12. PROVIDE SUPPLY AIR SMOKE DETECTOR FOR DOAS - UNIT MOUNTED.
13. PROVIDE MOTORIZED DAMPER FOR FRESH AIR INTAKE.
14. PROVIDE VARIABLE SPEED COMPRESSOR FOR ALL RTUs.
15. DOAS TO HAVE R-454B REFRIGERANT.
16. PLUMBING CONTRACTOR TO CORDINATE EXACT GAS REQUIREMENTS OF DOAS-1 INSTALLED ON SITE.

AIR CURTAIN SCHEDULE

MANUFACTURER	UNIT ID	MODEL	LENGTH (IN.)	HEIGHT (IN.)	WEIGHT (LBS)	TYPE	CFM	MAX VELOCITY (FPM)	MOTOR HP	V/PH/HZ	MCA	dBA
MARS	AC-1	LPV242-1UA-OB	42"	8"	35	UNHEATED	1050	1800	1/6	115/1/60	2.4	49
MARS	AC-2	LPV272-1UA-OB	72"	8"	60	UNHEATED	1800	1800	1/6	115/1/60	2.6	49

NOTES / ACCESSORIES:

1. PROVIDE MANUFACTURER RECOMMENDED ACCESSORIES.
2. COORDINATE WITH ELECTRICAL CONTRACTOR FOR EXACT POWER REQUIREMENT.
3. COORDINATE COLOR CODE WITH CLIENT/ARCHITECT.
4. CONTRACTOR SHALL COORDINATE WITH ARCHITECT/OWNER FOR PROPER INTEGRATION OF AIR CURTAIN WITH DOOR SENSORS OR OTHER CONTROL MECHANISMS. CONTROL SHALL BE PROVIDED TO OPERATE THE AIR CURTAIN IN SYNCHRONIZATION WITH THE OPENING AND CLOSING OF THE DOOR.

FAN SCHEDULE

UNIT ID	MANUFACTURER	MODEL	CFM	TYPE	DRIVE	FAN RPM	WEIGHT (LBs)	E.S.P. (IN. W.G.)	H.P	MOTOR MCA	MOTOR VOLTS	MOTOR PHASE	SERVICE	INTERLOCKED WITH	NOTES / ACCESSORIES
KEF-1	ADVANCE HOOD	AH-DU180HFA	2475	ROOF	DIRECT	1077	180	1.0	1.5	-	208	3	HOOD-1	HOOD-1	1,2,3,4,5,6,7
EF-1	GREENHECK	SP-LP0511-1	50	ROOF	DIRECT	685	10	0.5	-	0.4 A	115	1	MOP SINK	RTU-1	1,2,3,4,5,6
EF-2	GREENHECK	G-095-VG	140	ROOF	DIRECT	1219	55	0.5	-	4.8 A	115	1	REST ROOM/MOP	RTU-1	1,2,3,4,5,6

NOTES / ACCESSORIES:

1. WEATHER PROOF DISCONNECT SWITCH.
2. VARIABLE SPEED CONTROL.
3. SPEED CONTROL SWITCH.
4. THERMAL OVERLOAD PROTECTION.
5. ROOF CURB.
6. AMCA SEAL & UL CERTIFIED.
7. THERMAL OVERLOAD PROTECTION.

DIFFUSER AND REGISTER SCHEDULE

UNIT ID	MANUFACTURER	MODEL	SIZE	DESCRIPTION	REMARKS
A	METALAIRE	570006-AL (01) WHITE 570006-AL (03) BLACK	24"x24"	ALUMINUM, 2-CONE SQUARE FACE DIFFUSER WITH ROUND NECK. ALUMINUM, WITH ADJUSTABLE DISCHARGE AND RADIAL OPPOSED BLADE DAMPER, MODEL D3.	1,2,3,4,5
B	METALAIRE	570006-AL (01) WHITE 570006-AL (03) BLACK	12"x12"	ALUMINUM, 2-CONE SQUARE FACE DIFFUSER WITH ROUND NECK. ALUMINUM, WITH ADJUSTABLE DISCHARGE AND RADIAL OPPOSED BLADE DAMPER, MODEL D3.	1,2,3,4,5
C	METALAIRE	4004P	SEE PLANS	DUCT MOUNTED GRILLE	1,2
D	METALAIRE	CC5 CC15	6"x6"	ALUMINUM, SQUARE FACE GRILLE. ALUMINUM, WITH ADJUSTABLE AND OPPOSED BLADE DAMPER.	1,2,4
E	METALAIRE	7000-6(01) WHITE 7000-6(03) BLACK	24"X24"	ALUMINUM PERFORATED SUPPLY DIFFUSER WITH CURVED BLADE PATTERN CONTROLLER, VOLUME CONTROL OPPOSED BLADE DAMPERS,MODEL D3.	1,2,3,4,5
F	METALAIRE	S80H	24"X18"	STEEL, SQUARE FACE GRILLE. ALUMINUM, WITH ADJUSTABLE AND OPPOSED BLADE DAMPER.	1,2,4

NOTES:

1. MAXIMUM NOISE CRITERION RATING < 35 DBA.
2. BAKED ENAMEL FINISH, COLOR TO BE SELECTED BY ARCHITECT.
3. DIFFUSERS SHALL BE 4-WAY BLOW UNLESS OTHERWISE INDICATED ON PLANS.
4. MOUNTING FRAME TYPE SHALL BE COORD. WITH CEILING / WALL CONSTRUCTION TYPE.
5. NECK SIZE SHALL BE AS SCHEDULED.

NECK SIZES:	
Up To 100 CFM	- 6" DIA
101 To 250 CFM	- 8" DIA
200 To 400 CFM	- 10" DIA
400 To 600 CFM	- 12" DIA
400 To 800 CFM	- 14" DIA
500 To 900 CFM	- 16" DIA

Property of NY Engineers

FLAME BROILER

MECHANICAL SCHEDULES

M601

Mechanical Compliance Certificate

Project Information

Energy Code:	2024 IECC
Project Title:	Flame Broiler
Location:	Austin, Texas
Climate Zone:	2a
Project Type:	New Construction

Construction Site: **Owner/Agent:** **Designer/Contractor:**

Mechanical Systems List

Quantity	Component	Description
HVAC Systems		
1	RTU-1 (Single Zone w/ PerimeterSystem):	Heating: 1 each - Central Furnace (Heating Equip), Gas, Capacity = 80 kBtu/h Proposed Efficiency = 81.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE Cooling: 1 each - Single Package DX Unit (Cooling Equip), Capacity = 61 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 16.40 SEER2, Required Efficiency = 13.40 SEER2 Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00 Fan System: Unspecified
1	DOAS-1 (Single Zone):	Heating: 1 each - Central Furnace (Heating Equip), Gas, Capacity = 150 kBtu/h Proposed Efficiency = 81.00% Et, Required Efficiency: 80.00 % Et or 80% AFUE Cooling: 1 each - DX DOAS (Dehumidification), Capacity = 205 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 8.30 ISMRE, Required Efficiency = 4.00 ISMRE Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00 Fan System: Unspecified
Water Heaters		
1	WH-1:	Gas Instantaneous Water Heater, Capacity: 0 gallons, Input Rating: 300 kBtu/h w/ Circulation Pump Proposed Efficiency: 96.00 Et, Required Efficiency: 80.00 Et

Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2024 IECC requirements in COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title **Signature** **Date**

Inspection Checklist

Energy Code: 2024 IECC

Requirements: 100% were addressed directly in the COMcheck software

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

Plan Review

Section & Req.ID	Plan Review	Complies?	Comments/Assumptions
C155.2 [PR2]*	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical equipment and systems and the building envelope where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

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

Footing / Foundation Inspection

Section # & Req.ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C403.14.2, C403.14.3 [FO7]*	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit servicp for pavement temperature above 50F and outdoor temperature above 40F.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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

Plumbing Rough-In Inspection

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2* [PL1]*	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.6.1, C404.EF1 [PL2]*	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.6.1, C404.6.2 [PL3]*	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.6.3 [PL4]*	Pumps that circulate water between a heater and storage tank have controls that limit operation from start-up to <= 5 minutes after end of heating cycle.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.7 [PL5]*	Drain water heat recovery (DWHR) units comply with CSA B55.2 with pressure loss < 10 psi at maximum flow. Group R occupancies have DWHR efficiencies in accordance with CSA B55.1.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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

Mechanical Rough-In Inspection

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.3 [ME1]*	HVAC equipment efficiency verified.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	*See the Mechanical Systems list for values*
C403.12.3, C403.12.3.1, C403.12.3.2 [ME1.0]*	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in conditioned spaces. Walk-in coolers and freezers that comply with Sections C403.12.3.1 and refrigeration compressor systems that comply with C403.12.3.2.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.14.1 [ME14]*	Systems that heat outside the building envelope are radiant heat systems controlled by an occupancy sensing device or timer switch.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.13.1, C403.13.2 [ME15]*	HVAC ducts and plenums insulated in accordance with C403.13.1 and constructed in accordance with C403.13.3, verification may need to occur during Foundation Inspection.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.2.2 [ME16]*	Natural or mechanical ventilation is provided in accordance with International Mechanical Code Chapter 4. Mechanical ventilation has capability to reduce outdoor air supply to minimum per IMC Chapter 4.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.3.3 [ME20]*	Hot gas bypass limited to: <=240 kBtu/h - 50% >240 kBtu/h – 25%	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.1.3 [ME24]*	Where thermostatic control setpoints are adjustable by occupants or HVAC operators, the heating setpoint is independent for heating and cooling setpoint.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.1.5 [ME26]*	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperature > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 85F.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.9 [ME3]*	Large diameter fans where installed shall be tested and labeled in accordance with AMCA 205 and meet efficacy requirements of Table C403.9.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.7 [ME30]*	Doors or operable openings from conditioned spaces to outdoors > 40 sq ft controlling static controls interlocked with the heating and cooling system.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.8.1 [ME36]*	Dehumidification controls do not use mechanical cooling to reduce humidity < 60% or a dew point < 55F	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.4.8.2 [ME37]*	Humidity controls do not use fossil fuel or electricity for a humidify > 30% in warmest zone.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.4.8.3 [ME38]*	Zones served by systems with both humidification and dehumidification prevent simultaneous operation.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.5, C403.5.1, C403.5.2 [ME39]*	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer controls, and relief of excess outdoor air. Relieve excess outside air during operation.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.5.2 [ME40]*	Economizer operation will not increase heating energy use during normal operation.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.2 [ME4]*	Service water heating equipment meets efficiency requirements.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.5.3.3 [ME41]*	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.5.3.4 [ME42]*	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.5.3.5 [ME43]*	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.5.5 [ME45]*	Fault detection and diagnostics installed with air-cooled unitary DX units or VRF units having economizers.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.7.1 [ME56]*	Demand control ventilation provided for spaces > 500 ft2 and > 15 people > 100 ft2 per person design occupancy in systems with air side economizer, auto modulating outside air damper control, or design airflow >3,000 cfm.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.7.2 [ME57]*	Enclosed parking garage ventilation has separate ventilation systems for each section, can reduce airflow < 0.05 cfm/sq ft of floor area and >20% of design capacity.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.4 [ME59]*	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.7.5 [ME60]*	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria. Type I exhaust hoods contain demand ventilation systems in ventilation with > 50% reduction in exhaust.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.7.6 [ME61]*	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint in accordance with the sections C403.7.6.1 and C403.7.6.2.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.7.8, C403.7.8.1 [ME63]*	Classrooms, training rooms, conference and multipurpose rooms, lounges, enclosed offices, open office areas and conference contain occupied standby ventilation controls.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.8.1 [ME64]*	HVAC fan systems at design conditions do not exceed allowable fan system motor nameplate hp or fan system bhp.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	*See the Mechanical Systems list for values*
C403.8.3 [ME66]*	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Fans integral to equipment listed under Section C403.3.2.
C403.8.3 [ME66]*	Fans have a fan energy index (FEI) >= 1.00. Variable volume fans will have an FEI >= 0.95.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Fans integral to equipment listed under Section C403.3.2.
C403.15 [ME69]*	Dehumidification systems for plant growth and maintenance are tested in accordance with DOE 10 CFR 430, has on-site heat recovery > 75% of dehumidification energy or has a solid or liquid desiccant.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C403.16 [ME70]*	Service water pressure boost systems contain pressure sensors for pump control, no devices used to reduce pressure and booster pumps do not operate when there is no service water flow.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.17 [ME71]*	Clean water pumps achieve a pump energy index (PEI) <= 1.0.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.2.1 [ME73]*	Air outlets and zone terminal devices have means for air balancing.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

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

Property of NY Engineers

FLAME BROILER

ENERGY COMPLIANCE (01 OF 02)

M701

Rough-In Electrical Inspection

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.7 [EL3]	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.8 [EL4]	Electric motors meet the minimum efficiency requirements of Table C405.8(1) through C405.8(4). Electronically enabled motors with certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.10 [EL1]	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C405.10.1, C405.10.2 [EL5]	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.12, C405.12.1 [EL6]	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and > 25% of branch circuit feeders for modular furniture will have automatic receptacle control in accordance with C405.11.1.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

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

Final Inspection

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C403.1.1 [FI12]	HVAC systems and equipment design loads calculated in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.3.1 [FI13]	HVAC systems and equipment capacity does not exceed calculated loads.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.1 [FI14]	Heating and cooling to each zone is controlled by a thermostat cyclind. Minimum one humidity control device per installed humidification/dehumidification system.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.1.2 [FI16]	Thermostatic controls have a 5 °F deadband.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.1.4 [FI17]	Temperature controls have setpoint overlap restrictions.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.2 [FI18]	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C403.4.2.1, C403.4.2.2 [FI19]	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.3 [FI2]	Heat traps installed on supply and discharge piping of non-circulating systems.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.4 [FI3]	All service water heating piping meets the thickness requirements of Table C404.4.1.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C404.6.1 [FI21]	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C405.15.1, C405.15.2 [FI25]	Buildings in climate zones 0 - 7 comply with the on-site and/or off-site renewable energy requirements of Section C405.15.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.1.1 [FI58]	Building operations and maintenance documents will be provided to the owner. Documents will cover manufacturers' information, specifications, programming software, and sequences of operation. The new building, equipment and systems are intended to be installed, maintained, and operated.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.1 [FI59]	Commissioning plan developed by registered design professional or approved agency.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.3.1 [FI60]	HVAC equipment, systems and system-to-system relationships have been tested to ensure proper operation.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.3.2 [FI74]	HVAC and service water heating control systems have been tested to ensure proper operation, calibration and adjustment of controls.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.3.3 [FI75]	Economizers have been tested to ensure proper operation.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.4 [FI61]	Preliminary commissioning report completed and certified by registered design professional or approved agency.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.5 [FI75]	Furnished HVAC as-built drawings submitted within 90 days of system acceptance.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.5.1 [FI62]	An air and/or hydronic system balancing report is provided for HVAC systems.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.5.2 [FI76]	Final commissioning report due to building owner within 90 days of receipt of certificate of occupancy.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.3.2.2 [FI77]	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.3.2.2 [FI63]	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

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

Property of NY Engineers

FLAME BROILER

ENERGY COMPLIANCE (02 OF 02)

M702

PLUMBING SYMBOLS LIST

- SANITARY PIPING
- VENT PIPING
- COLD WATER PIPING
- HOT WATER PIPING
- EXISTING COLD WATER PIPING
- EXISTING HOT WATER PIPING
- HOT WATER RETURN PIPING
- SAN - UNGD. SANITARY PIPING
- GSAN - UNGD. GREASE WASTE PIPING
- EXISTING UNGD. SANITARY PIPING
- G - GAS PIPING
- EXISTING GAS PIPING
- P-TRAP
- PIPE UP
- PIPE DROP
- PLUGGED OUTLET/CLEANOUT
- SHUT-OFF VALVE
- CHECK VALVE
- BACK FLOW PREVENTER
- SLEEVE
- GAS PLUG VALVE
- BALANCING VALVE
- PRESSURE RELIEF VALVE
- POINT OF NEW CONNECTION
- POINT OF DISCONNECTION

PLUMBING ABBREVIATIONS

FCO	FLOOR CLEAN OUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
V	VENT
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST.	EXISTING
G	GAS
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
SQ. FT.	SQUARE FEET
BFP	BACK FLOW PREVENTER
WH	HOT WATER HEATER
ET	EXPANSION TANK
RCP	RE-CIRCULATION PUMP
GSAN	GREASE SANITARY

BUILDING DEPARTMENT PLUMBING NOTES:

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT & WATER DISTRIBUTION PIPING SYSTEMS) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF UNIFORM PLUMBING CODE 2024.
2. INSTALLATION OF UNDERGROUND SANITARY DRAINAGE AND VENT PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IN PC 701.2
3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION IN PC 312.
4. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION IN PC 314.
5. RODENT PROOFING AS PER IN PC 312.12.
6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION IN PC301, PC604, PC 701,PC803, PC903, PC1003.
7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER PC 1005, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 707.
9. GREASE INTERCEPTORS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 1014.
10. BUILDING HOUSE TRAPS SHALL BE PROVIDED AS PER SECTION PC 1008.
11. DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 707.
12. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 313.
13. 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
14. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF PC CHAPTER 7 SECTIONS PC 701 THROUGH PC 710.
15. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912.
16. INSPECTION AND TESTING OF GAS PIPING SYSTEM SHALL BE IN ACCORDANCE WITH CHAPTER 12 SECTION 1213.0 OF UPC 2024.

PLUMBING DRAWING LIST

P001 PLUMBING SYMBOLS, ABBREVIATIONS, NOTES & SPECIFICATIONS.

P002 PLUMBING SPECIFICATIONS

P101 PLUMBING WATER SUPPLY AND GAS FLOOR PLAN

P102 PLUMBING SANITARY AND VENT FLOOR PLAN

P501 PLUMBING DETAILS-1

P502 PLUMBING DETAILS-2

P601 PLUMBING ISOMETRIC RISERS AND SCHEDULE

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.

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

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

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

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

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

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

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

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

1.03 SUBSTITUTIONS

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

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

1.04 DEFINITIONS

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

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

C. PROVIDE: TO FURNISH AND INSTALL.

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

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

1.05 DRAWINGS

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

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

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

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

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

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

1.06 PRODUCTS

A. SANITARY AND VENT PIPING:

1. ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
3. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.
4. PVC PIPING IS PROHIBITED WITHIN PLENUM SPACE.

B. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2024 INTERNATIONAL ENERGY CONSERVATION CODE, SECTION C403.11.3 REFER BELOW TABLE.

MINIMUM PIPE INSULATION THICKNESS

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

7. WATER DISTRIBUTION SYSTEM AS PER 2024 INTERNATIONAL ENERGY CONSERVATION CODE, C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
   a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
   b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).
8. AS PER 2024 INTERNATIONAL ENERGY CONSERVATION CODE 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 2024 INTERNATIONAL ENERGY CONSERVATION CODE, C404.5.1. THE HOT WATER 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'	43'
¾"	0.5'	21'
1"	0.5'	13'
1¼"	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. GAS FIRED INSTANTANEOUS WATER HEATER:

1. PROVIDE HIGH EFFICIENCY GAS FIRED, INSTANTANEOUS WATER HEATERS SIZE, LOCATION AND CAPACITY SHALL BE AS AS INDICATED ON THE DRAWINGS.
2. FACTORY-INSTALLED TEMPERATURE AND PRESSURE RELIEF VALVE EXTEND DISCHARGE PIPE, FULL SIZE, TO WITHIN 6" ABOVE THE MOP SINK OR FLOOR DRAIN.
3. PROVIDE POTABLE WATER EXPANSION TANK AS SPECIFIED EQUAL PRODUCTS BY WATTS, AMTROL, OR BELL & GOSSETT MAY BE PROVIDED AT THE CONTRACTOR'S OPTION

D. MIXING VALVES

1. VALVE BODY SHALL BE MADE OF CAST BRASS. THE INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.
2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM, AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 105°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 5GPM @ 45 PSIG DIFFERENTIAL.
3. TYPES OF VALVES: TYPE A- THERMOSTATICALLY OPERATED BY MEANS OF BI-METALLIC STRIP, OR EXPANSION BELLOWS; TYPE B- SINGLE HANDLE MECHANICAL MIXER, OR INDIVIDUAL HOT AND COLD CONTROL VALVES; TYPE C- PRESSURE BALANCING SHOWER VALVE/PISTON OPERATED MIXING VALVE; TYPE D- BALANCED PRESSURE OPERATION, WITH INTEGRAL DIAL THERMOMETER INDICATING DELIVERED WATER TEMPERATURE.
4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

E. HOT WATER RE-CIRCULATING PUMP

1. IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.
2. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON-OVERLOADING AT ANY POINT ON PUMP CURVE.
3. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP-PROOF, SLEEVE-BEARING, QUIET OPERATING, RUBBER-MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT-IN THERMAL OVERLOAD PROTECTION.
4. INSTALL IN-LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS, BOTH SIDES OF IN-LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.

F. GAS PIPING:

1. ALL GAS PIPING WORK SHALL COMPLY WITH UNIFORM PLUMBING CODE 2024, LOCAL UTILITY GAS REQUIREMENTS AND NFPA 54, ANSI Z223.1.
2. FURNISH AND INSTALL ALL NECESSARY GAS PIPING TO ALL EQUIPMENT REQUIRING GAS SUPPLY INCLUDING RECONNECTION TO EXISTING ACTIVE GAS BURNING EQUIPMENT
3. PROVIDE A LUBRICATED GAS VALVE AT ALL CONNECTIONS TO EQUIPMENT.
4. ALL GAS PIPING AND INSTALLATION SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF LOCAL UTILITY GAS COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.
5. PROVIDE ADEQUATE SUPPORT FOR ALL PIPING.
6. GAS PIPING SHALL BE BLACK STEEL SCHEDULE 40 THREADED PIPE CONFORMING TO ANSI B36-20.
7. FITTINGS SHALL BE MALLEABLE IRON.
8. VALVES SHALL BE NORDSTROM IRON PLUG VALVES FIG. 142.
9. PIPING UNDERGROUND BENEATH BUILDING SHALL COMPLY WITH UNIFORM PLUMBING CODE 2024.

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PLUMBING SYMBOLS, ABBREVIATIONS, NOTES AND SPECIFICATION

P001

G. HANGERS AND SUPPORTS:

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

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

3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.

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

5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION, THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.8.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2-1/2" AND LARGER (1-1/4" AND LARGER INBOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.

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

H. VALVES:

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

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

3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.
4. ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.

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

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

I. SLEEVES AND ESCUTCHEONS:

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

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

J. DRAINAGE ACCESSORIES

1. GENERAL:

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

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

2. DEVICES:

   a. CLEANOUT & CLEANOUT PLUG

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

   b. CLEANOUT WALL PLATE

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

   c. CLEANOUT DECK PLATE

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

K. 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.

L. VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES.

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.

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

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

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

P. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

R. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

T. 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.

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

V. 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.

W. 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.

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

Y. CONNECT GAS PIPING TO ALL GAS-FIRED EQUIPMENT WITH GAS COCK, DIRT LEG AND UNION.

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

AA. ALL PIPING INSTALLED ON THE ROOF SHALL BE SUPPORTED BY "PILLOW BLOCK" PIPE STANDS AS MANUFACTURED BY MIRO INDUSTRIES, OR APPROVED EQUAL. WOOD PIPE SUPPORTS SHALL NOT BE ACCEPTABLE. PROVIDE TRAFFIC/WALK PADS BELOW ALL PIPE STANDS.

AB. 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.

AC. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK-CLOSING VALVES.

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

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

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

2. INSTALLATION

2.01 GENERAL

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

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

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

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

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

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

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

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

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

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

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

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

2.02 ABOVE GRADE

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

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

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

2.03 INSULATION

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 1¼" AND 1½" THICK FOR PIPE SIZE 1½" AND GREATER WITH MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH ½" THICK FOR PIPE SIZE UP TO 1¼" AND 1" THICK FOR PIPE SIZE 1½" AND GREATER WITH 1" MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED WITH MANVILLE ZESTON 2000 PVC INSULAT-ED FITTING COVERS. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE INTERNATIONAL BUILDING CODE REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2024 INTERNATIONAL ENERGY CONSERVATION CODE.

3. TESTING

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

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

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

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

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

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

G. 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.

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

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

J. ALL EQUIPMENT WILL BE FACTORY TESTED.

K. 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.

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

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

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

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

4. WARRANTY

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.

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PLUMBING SPECIFICATIONS

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GENERAL NOTES:

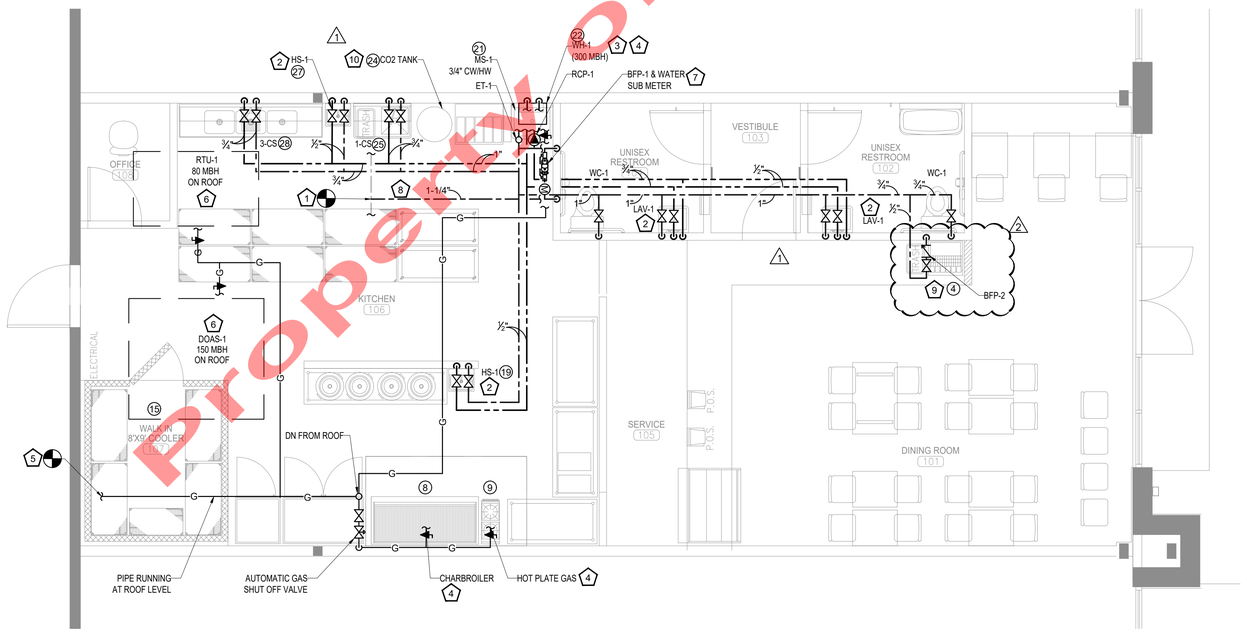
1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2024 INTERNATIONAL ENERGY CONSERVATION NOTES(REFER SHEET P001)
2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
6. WATER HEATER DRAIN SPILLS TO THE MOP SINK.

WATER HEATER CALCULATION:

SR. NO.	FIXTURE	QUANTITY	FLOW RATE (GPM)	
			PER FIXTURE	TOTAL
01	3 COMP. SINK,FAUCET	01	2	2.0
02	HAND SINK	02	0.5	1.0
03	LAVATORY	02	0.5	1.0
04	MOP SINK	01	2	2.0
05	1 COMP PREP SINK	01	2	2.0
		TOTAL FLOW RATE (GPM)		8.0

WATER AND GAS KEYED NOTES:

1. EXTEND AND CONNECT NEW 1-1/4" CW PIPING TO EXISTING 2" CAPPED DOMESTIC CW MAIN LINE STUBBED INTO THE SPACE. CONTRACTOR TO FIELD VERIFY SIZE AND LOCATION OF EXISTING WATER MAIN LINE ON SITE.
2. PROVIDE THERMOSTATIC MIXING VALVES AT ALL LAVATORIES AND HAND SINKS. SET AT 110° F MAX.
3. WALL MOUNTED INSTANTANEOUS GAS FIRED WATER HEATER (WH-1) ABOVE MOP SINK (MS-1) WITH EXPANSION TANK (ET-1) & RE-CIRCULATION PUMP (RCP-1).
4. CONTRACTOR TO FIELD VERIFY GAS PRESSURE AND MAKE SURE TO PROVIDE ADEQUATE INLET PRESSURE FOR GAS EQUIPMENTS.
5. EXTEND AND CONNECT NEW 2" GAS LINE TO THE EXISTING GAS LINE WITH THE EXISTING METER. CONTRACTOR SHALL FIELD-VERIFY THE LOCATION, CAPACITY OF THE EXISTING GAS METER AND THE SIZE OF THE GAS SERVICE. PROVIDE A NEW GAS METER IF THE EXISTING METER CAPACITY IS LESS THAN 1000 MBH, IF THE OUTLET PRESSURE IS BELOW 14" W.C., OR IF NO EXISTING METER IS AVAILABLE. BASE BID ACCORDINGLY. COORDINATE WITH TEXAS GAS SERVICE FOR SUITE SPECIFIC GAS SERVICE.
6. EXTEND GAS PIPE TO CONNECT TO HVAC EQUIPMENT. PROVIDE GAS SUPPLY CONNECTION WITH SHUT-OFF VALVE, SEDIMENT TRAP AND FLEXIBLE CONNECTION.
7. PROVIDE NEW 1" WATER SUB-METER AND 1-1/4" BACKFLOW PREVENTER AS SHOWN ON PLAN, IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL JURISDICTION. SUB-METER TO BE BY BADGER RECORDALL MODEL M-70 WITH VL9 REMOTE READER. INSTALL REMOTE READER IN AN EASILY ACCESSIBLE LOCATION. CONTRACTOR SHALL INFORM OWNER IF WATER PRESSURE AT TIE-IN POINT IS BELOW 40 PSI.
8. NO TAP OFF BEFORE BFP.
9. PROVIDE WITH WATER FILTER AND BACK FLOW PREVENTER. CONTRACTOR TO FIELD VERIFY AND INSTALL BACK FLOW PREVENTER AT ACCESSIBLE LOCATION FOR THE TESTING, MAINTENANCE AND REPAIR AS PER THE LOCAL CODE AHJ.
10. THE CONTRACTOR SHALL COORDINATE THE FINAL CARBON DIOXIDE (CO_2) TANK SIZE AND TOTAL STORAGE VOLUME WITH THE OWNER PRIOR TO INSTALLATION. WHERE THE TOTAL CO_2 QUANTITY EXCEEDS 100 POUNDS, THE INSTALLATION SHALL COMPLY WITH THE 2024 INTERNATIONAL FIRE CODE (IFC) SECTION 5307.3. FOR TOTAL CO_2 QUANTITIES OF 101 POUNDS OR GREATER, AN AUSTIN FIRE DEPARTMENT ABOVEGROUND HAZARDOUS MATERIALS PERMIT SHALL BE OBTAINED IN ACCORDANCE WITH 2024 IFC SECTION 105.5.22 (CITY OF AUSTIN AMENDMENT).



2 PLUMBING WATER SUPPLY AND GAS FLOOR PLAN

SCALE: ¼"=1'-0"

1 WATER AND GAS KEY NOTES

SCALE:NTS

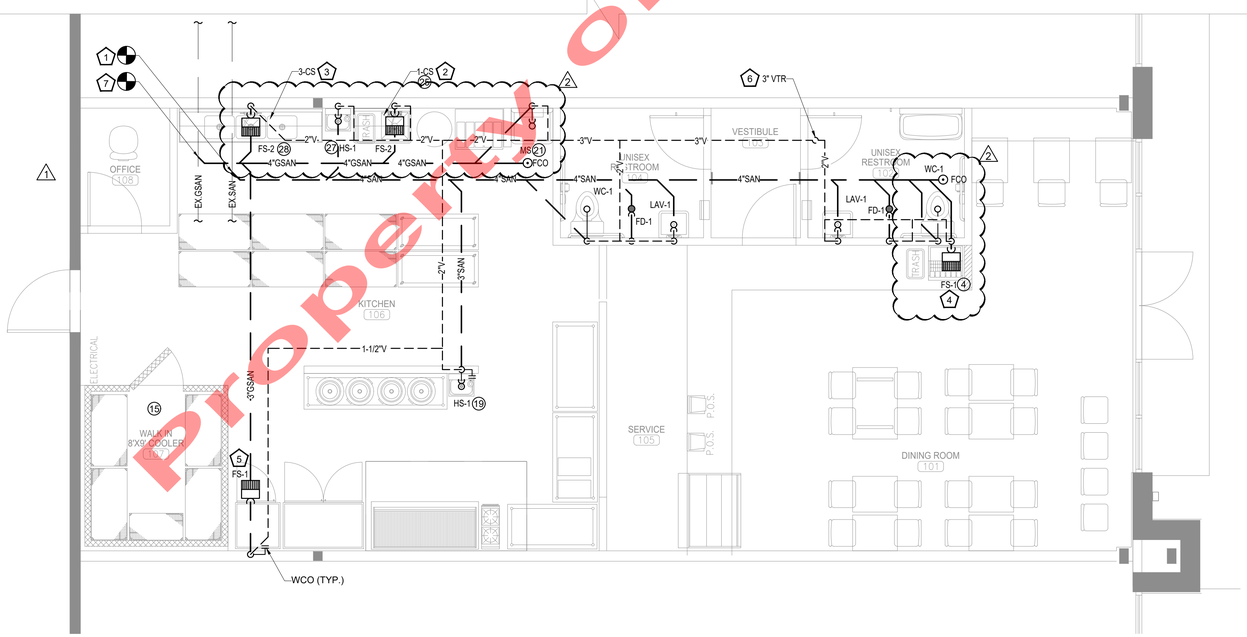
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PLUMBING WATER SUPPLY AND GAS FLOOR PLAN

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GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
2. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
3. PROVIDE TRAP PRIMER FOR FLOOR DRAINS.

SANITARY KEYED NOTES:

1. EXTEND AND CONNECT NEW 4" SANITARY PIPING TO EXISTING SANITARY MAIN LINE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION, INVERT AND DIRECTION OF FLOW OF EXISTING SANITARY MAIN LINE ON SITE.
2. ROUTE INDIRECT WASTE FROM 1 COMPARTMENT SINK UNIT TO FLOOR SINK (FS-2) WITH APPROVED AIR GAP.
3. ROUTE INDIRECT WASTE FROM 3 COMPARTMENT SINK UNIT TO FLOOR SINK (FS-2) WITH APPROVED AIR GAP.
4. ROUTE INDIRECT WASTE FORM SODA DISPENSER TO NEAREST FLOOR SINK (FS-1) WITH APPROVED AIR GAP.
5. ROUTE CONDENSATE LINE FROM WALK-IN COOLER AND WALK IN FREEZER TO FLOOR SINK (FS-1) WITH APPROVED AIR GAP.
6. PROVIDE 3" V.T.R THROUGH ROOF.
7. CONNECT NEW 4" GREASE WASTE LINE TO EXISTING 4" GREASE WASTE LINE/STUB OUT CONNECT TO NEW 750 GALLON GREASE INTERCEPTOR (GI-1). CONTRACTOR TO FIELD VERIFY AND COORDINATE WITH CIVIL ENGINEER TO CONFIRM THE LOCATION OF THE 750 GALLON GREASE INTERCEPTOR.
8. GI-1 GRAVITY GREASE INTERCEPTOR (PARK-GTF-BG-750) 750 GALLONS CAPACITY. INSTALL GREASE INTERCEPTOR AS PER MANUFACTURER RECOMMENDATION AND LOCAL GUIDELINES. CONTRACTOR TO FIELD VERIFY GREASE INTERCEPTOR LOCATION AS PER SITE CONDITION PRIOR TO BID AND COORDINATE WITH ARCHITECT/LANDLORD/CIVIL FOR FINAL GREASE INTERCEPTOR LOCATION. BASE BID ACCORDINGLY. NOTIFY ENGINEER IF ANY DISCREPANCIES.
9. FOR SAMPLING PORT COORDINATE WITH THE CIVIL CONTRACTOR. IF NOT PRESENT, PROVIDE A NEW SAMPLING PORT IN ACCORDANCE WITH LOCAL CODES AND JURISDICTIONAL REQUIREMENTS.

1

FLAME BROILER

PLUMBING SANITARY AND VENT FLOOR PLAN

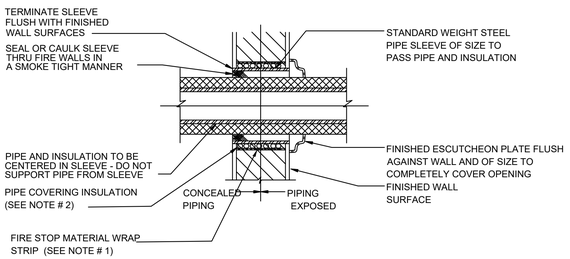
P102

2 PLUMBING SANITARY AND VENT FLOOR PLAN

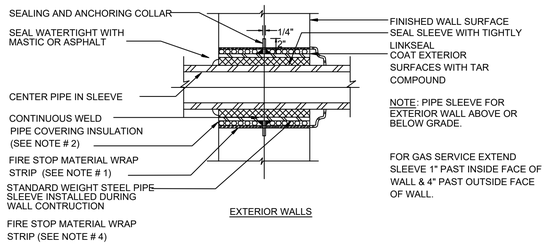
SCALE: ¼"=1'-0"

1 SANITARY KEY NOTES

SCALE:NTS



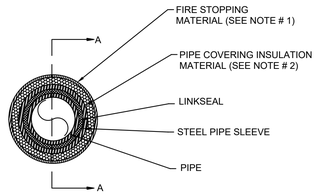
INTERIOR WALLS



EXTERIOR WALLS

NOTE: PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE.

FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL & 4" PAST OUTSIDE FACE OF WALL.

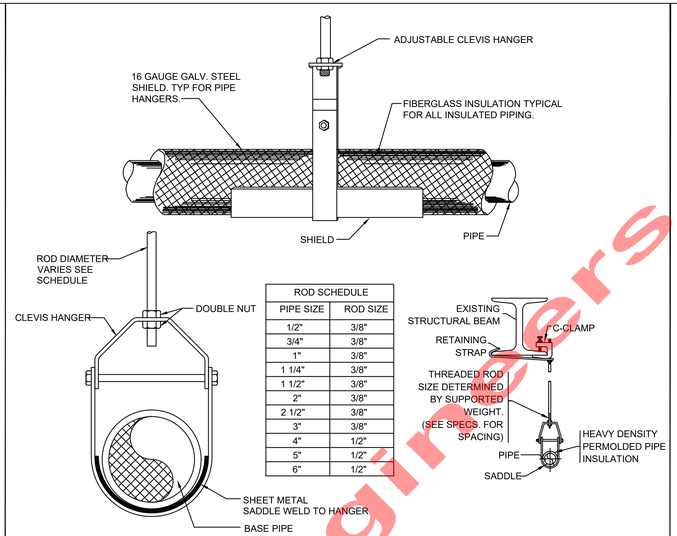


PIPE SLEEVE VIEW

NOTES:

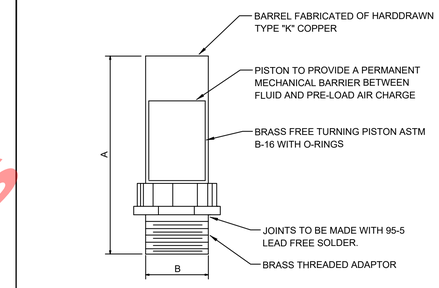
1. FIRESTOP MATERIAL WRAP STRIP SHALL BE ¼" THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL SUPPLIED IN 2 IN. WIDE STRIPS AND WRAP AROUND THE PIPE AS PER UL MATERIAL LISTED3M COMPANY FS-195+ OR FILL CAVITY WITH CAULK OR SEALANT MIN. ¼" DIA. CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED OF THE WRAP STRIP LAYER APPROX. 3/4" FROM WALL SURFACE. AS PER UL LISTED 3M COMPANY CP25WB+, IC 15WB+, FIRE DAM 150+CAULK.
2. PIPE COVERING INSULATION SHALL BE 2" THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKETED. AS PER UL CLASSIFICATION AND MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

1 PIPE SLEEVE THRU SECTION N.T.S



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

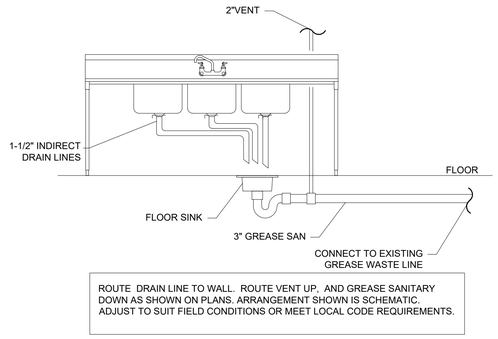
2 HANGER DETAIL N.T.S



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

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

3 WATER HAMMER ARRESTOR DETAIL N.T.S

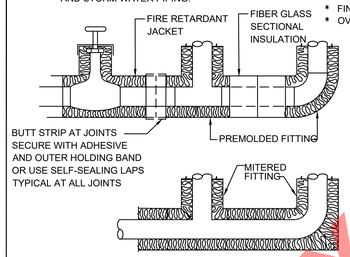


ROUTE DRAIN LINE TO WALL. ROUTE VENT UP, AND GREASE SANITARY DOWN AS SHOWN ON PLANS. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS OR MEET LOCAL CODE REQUIREMENTS.

4 3 COMPARTMENT SINK DETAILS N.T.S

CONCEALED VALVES AND FITTINGS

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

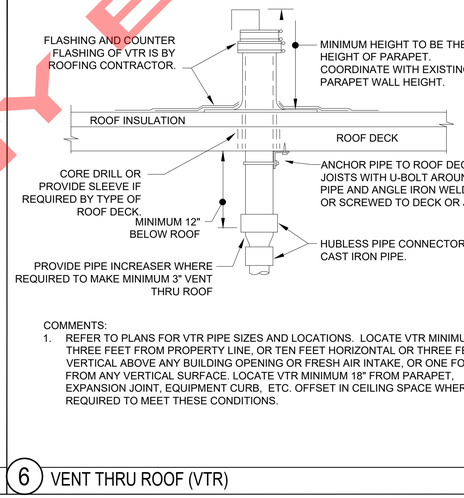


CONCEALED VALVES AND FITTINGS

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



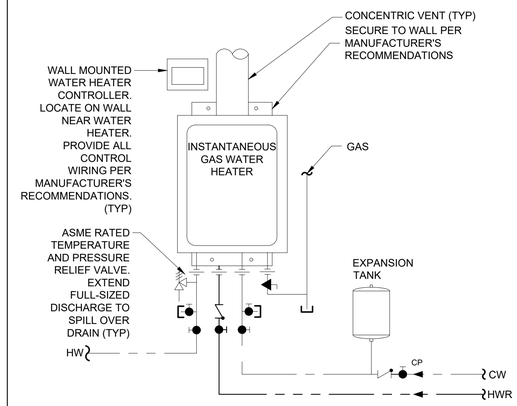
5 INSULATION OF PIPING, VALVES AND FITTINGS DETAILS N.T.S



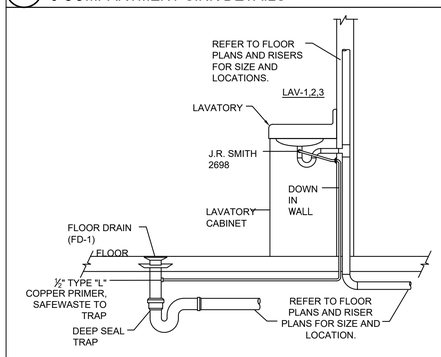
COMMENTS:

1. REFER TO PLANS FOR VTR PIPE SIZES AND LOCATIONS. LOCATE VTR MINIMUM THREE FEET FROM PROPERTY LINE, OR TEN FEET HORIZONTAL OR THREE FEET VERTICAL ABOVE ANY BUILDING OPENING OR FRESH AIR INTAKE, OR ONE FOOT FROM ANY VERTICAL SURFACE. LOCATE VTR MINIMUM 18" FROM PARAPET, EXPANSION JOINT, EQUIPMENT CURB, ETC. OFFSET IN CEILING SPACE WHERE REQUIRED TO MEET THESE CONDITIONS.

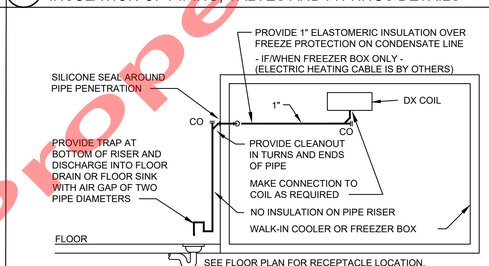
6 VENT THRU ROOF (VTR) N.T.S



7 HOT WATER HEATER INSTALLATION DETAIL N.T.S

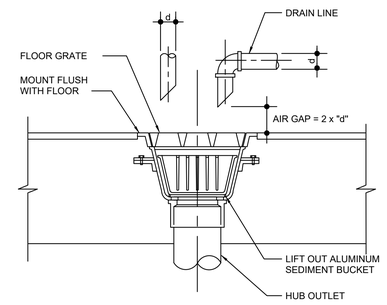


8 FLOOR DRAIN TRAP PRIMER DETAIL N.T.S



INSTALL PIPE HIGH AS POSSIBLE, ANCHORED TO WALL OF BOX WITH SUPPORTS AT MAXIMUM SIX FOOT CENTERS USE TYPE "M" HARD COPPER TUBE AND FITTINGS WITH LEAD-FREE SOLDER JOINTS SLOPE HORIZONTAL PIPE AT MINIMUM TWO PERCENT .REFER TO LOCAL CODE FOR INDIRECT DRAIN REQUIREMENTS.

9 WALK IN COOLER / FREEZER DRAIN N.T.S



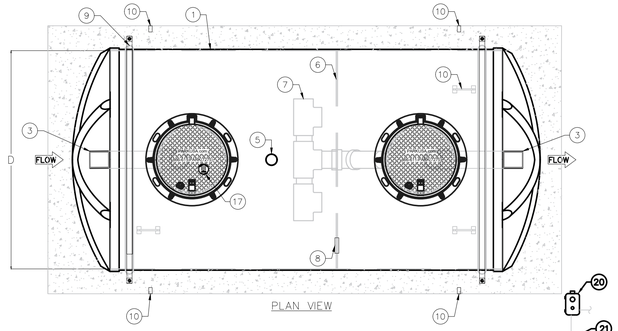
10 FLOOR SINK DETAIL N.T.S

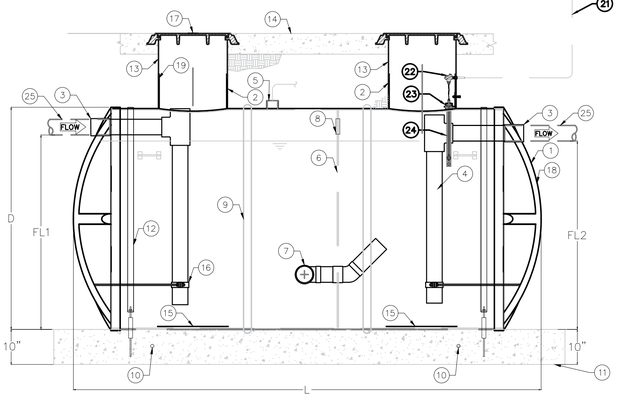
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FLAME BROILER

PLUMBING DETAILS-1

P501

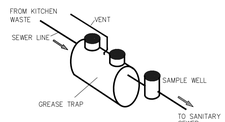




KEYED NOTES		
MARK	QTY	DESCRIPTION
1	1	REINFORCED FIBERGLASS GREASE INTERCEPTOR
2	2	FIBERGLASS MANWAY EXTENSION
3	2	X" PVC COUPLING
4	2	INTERIOR PVC PIPING & CLEANOUT
5	1	X" TANK VENT
6	1	INTERIOR BAFFLE
7	1	4" PVC DOUBLE TEE MANIFOLD
8	1	2" VENT SLEEVE IN BAFFLE
9	-	STRUCTURAL SUPPORT RIB (AS REQ'D)
10	4	LIFTING LUG
11	1	REINFORCED CONCRETE INTEGRATED PAD
12	–	TANK ANCHOR STRAP (AS REQ'D)
13	2	24" DIA MANWAY EXTENSION (SS304) W/ SETSCREWS
14	-	CONCRETE APRON (BY OTHERS)
15	2	24" SQ STRIKER PLATE, SS304
16	2	PIPE SUPPORT BRACKET
17	1	NAMEPLATE INDICATING MFG: PARKUSA WWW.PARKUSA.COM 888-611-PARK MODEL GTF-BG DATE MANUFACTURED
18	–	CARBOTHANE 134HG EXTERIOR COATING
19	–	EXTENSION ANNULUS TO BE SEALED w/SILICON SEALANT (TYP)
20	1	CONTROL PANEL W/ AUDIBLE & VISUAL ALARM FOR SENSORS (NEMA 4X)
21	2	CABLE & CONDUIT ROUTED TO CONTROL PANEL (BY OTHERS)
22	1	ELECTRICAL CONDUIT JUNCTION BOX
23	1	FULL THREAD FLOAT BRACKET
24	1	HIGH GREASE LEVEL SENSOR (NEMA 7)
25	2	X" INLET/OUTLET (BY OTHER)

GREASE INTERCEPTOR
SHELL GTF-BG
SHELL GT-XXXXXX
PARK
INTERCEPTOR

GREASE INTERCEPTOR SCHEDULE						
MODEL NO.	CAPACITY USGal	GREASE CAP (LBS)	DIAMETER, ID (D)	MAX OVERALL LENGTH (L)	INLET FL1	OUTLET FL2
GTF-BG-750	750	1,700	4'-0"	11'-4"	3'-3"	3'-0"



STANDARD APPLICATION

IAPMO
ASPE Member
UPC Uniform Plumbing Code Listed

SPECIFICATIONS

TYPICAL APPLICATIONS INCLUDE COMMERCIAL AND INDUSTRIAL FOOD SERVICE KITCHENS WHERE EXCESSIVE GREASE MAY INTERFERE WITH THE PROPER DRAINAGE OF THE SEWER SYSTEM. THE GREASE INTERCEPTOR IS GENERALLY BURIED BELOW GRADE FOR GRAVITY FLOW SEWER SYSTEMS. A SAMPLE WELL IS UTILIZED ON THE OUTLET SIDE FOR SAMPLING BY THE LOCAL WATER AUTHORITY.

TANK: THE TANK SHELL SHALL BE CONSTRUCTED FROM COMPOSITE REINFORCED FIBERGLASS. TANK SHALL HAVE ONE-PIECE CONSTRUCTION AT SHELL, END CAPS, AND BAFFLE.

ACCESS COVER: MANHOLE FRAMES, COVERS OR GRATES ARE MANUFACTURED OF DUCTILE IRON CONFORMING TO ASTM A536, AASHTO M306, & AASHTO M105 STANDARDS. MANHOLE SHALL BE TRAFFIC DUTY. (W/EXTENSION)

ENGINEERING DATA

THE GREASE INTERCEPTOR IS STRUCTURALLY & HYDRAULICALLY ENGINEERED TO CONFORM TO REGIONAL PLUMBING CODES RECOMMENDED IN MOST CITIES. CONSULT WITH LOCAL AUTHORITIES FOR SPECIFIC APPLICATION REQUIREMENTS.

CONSULT WITH PARKUSA FOR EXACT INSTALLATION DIMENSIONS & SHIPPING INFORMATION.

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PARK USA
A Northwest Pipe Company

GREASE INTERCEPTOR
(BELOW GRADE) MODEL GTF-BG 500 THRU 6,000

PM	PC	DRN	ENG	DWG. NO.	REV.
.	.	.	.	GTF-BG-WA	A
DATE	9/24				

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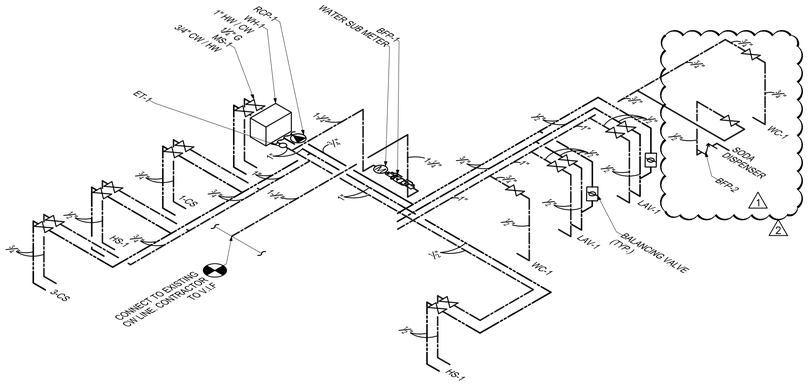
1 GREASE INTERCEPTOR DETAIL N.T.S

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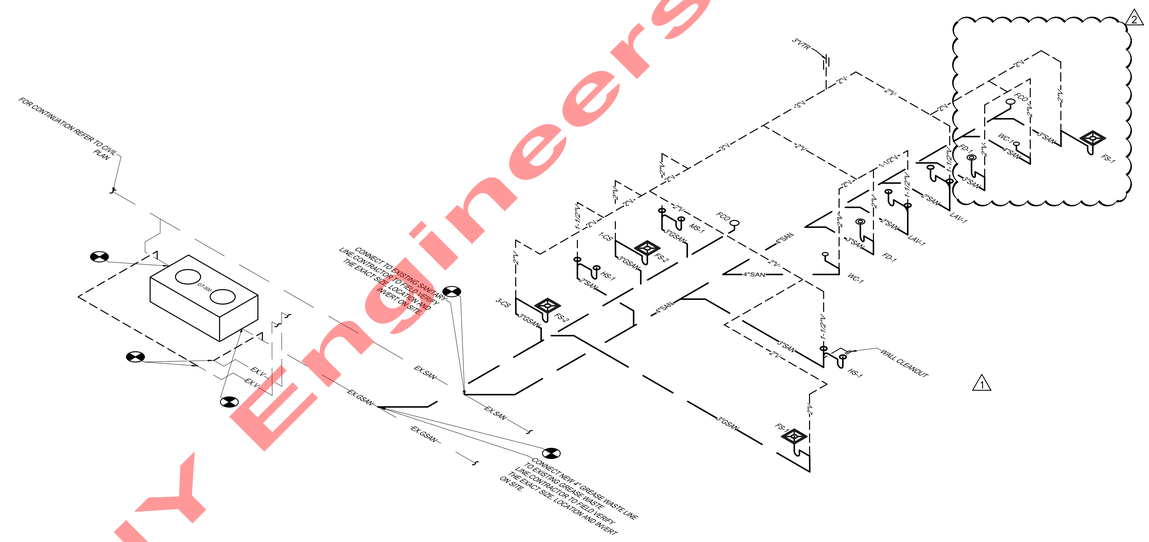
FLAME BROILER

PLUMBING DETAILS-2

P502



1 WATER RISER DIAGRAM SCALE:NTS



2 SANITARY RISER DIAGRAM SCALE:NTS

PLUMBING FIXTURE SCHEDULE

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE - INCHES						REMARKS
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMOSTATIC MIXING VALVE	
WC-1	WATER CLOSET	-	4"	2"	¾"	-	-	FLUSH TANK
LAV-1	LAVATORY	2"	2"	1-1/2"	½"	½"	PROVIDE	P-TRAP
MS-1	MOP SINK	3"	3"	2"	¾"	¾"	-	P-TRAP
FD-1	FLOOR DRAIN	3"	3"	2"	-	-	-	-
3-CS	3-COMPARTMENT SINK	-	3"	2"	¾"	¾"	-	I.W. FROM 3CS SPILLS INTO FLOOR SINK
HS-1	HAND SINK	2"	2"	1-1/2"	½"	½"	PROVIDE	P-TRAP
FS-1	FLOOR SINK	2"	2"	1-1/2"	-	-	-	P-TRAP
FS-2	FLOOR SINK	3"	3"	2"	-	-	-	P-TRAP
1-CS	1-COMPARTMENT SINK	-	3"	2"	¾"	¾"	-	I.W. FROM 1CS SPILLS INTO FLOOR SINK

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

HOT WATER HEATER

TAG No.	MAX INPUT (MBH)	FIXTURES SERVING	QUANTITY	TYPE	THERMAL EFFICIENCY %	MANUFACTURER & MODEL NO.	REMARKS
WH-1	300	3-COMPARTMENT SINK, MOP SINK,1-COMPARTMENT SINK, HAND SINK, LAVATORY.	1	GAS TANKLESS TYPE WATER HEATER	96	NORITZ NCC300DV	-DIMENSIONS 19.9"W X 11.8"D X 32.7"H -WALL MOUNTED

THERMOSTATIC MIXING VALVE SCHEDULE

ITEM	SERVING	SERVICE	CAPACITY RANGE (GPM)		TEMP. RANGE (°F)		MANUFACTURER & MODEL NO.	REMARKS
			MIN.	MAX.	MIN.	MAX.		
MIXING VALVE	HAND SINK, LAVATORY	HOT WATER	0.5	2	105	110	WATTS MODEL LFUSG-B-M2	-LEAD FREE VAST COPPER SILICON ALLOY BODY -ASSE 1070 LISTED -CSA APPROVED

EXPANSION TANK SCHEDULE

TAG	LOCATION	SERVICE	MANUFACTURER & MODEL	DIMENSION (DIA X HEIGHT)	WEIGHT (LBS)	NO. OF EXPANSION TANK
ET-1	REFER FLOOR PLANS	HW	THERM-X-TROL ST-1	3.4" X 4"	1	1

BACKFLOW PREVENTER SCHEDULE

TAG	LOCATION	MODEL	ASSE
BFP-1	MAIN WATER SUPPLY	WATTS 009 SERIES (RPZ) OR EQUAL (1-1/4" SIZE)	1013
BFP-2	SODA DISPENSER	WATTS 009-QT-S-FS 1/2	1013

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

PUMP SCHEDULE

TAG	QUANTITY	SERVICE	LOCATION	PERFORMANCE DATA/PUMP			PUMP CONSTRUCTION DATA		MOTOR DATA/PUMP						WEIGHT (LBS)	MFGR MODEL	REMARKS
				GPM	TDH (FT)	WATER TEMP. (°F)	PUMP TYPE	IMPELLER MATERIAL	POWER INPUT	STARTER TYPE	V/PH/HZ	RPM	F.L.A.	SERVICE FACTOR			
RCP-1	01	HWR CIRC. SYSTEM	KITCHEN	2	7	110	INLINE	NORYL	39 WATTS	AQUA STAT	115/1/60	2800	0.38	1.0	10	BELL & GOSSETT NBF-8S	INLINE ON HW RETURN LINE AT WATER HEATER WITH NEMA 1 RATED MOTOR

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

NOTES:
1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWD FITTINGS
2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR
3. VERIFY ALL EQUIPMENT BTUS'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING UNIFORM PLUMBING CODE CODE (UPC 2024), TABLE 1215.2(3)
4. ALL GAS EQUIPMENT SHALL BE PROVIDED WITH PRESSURE REGULATOR TO OPERATE EQUIPMENT SATISFACTORILY.

GAS LOAD SUMMARY

EQUIPMENT	QTY	MBH LOAD
WH-1	1	300
GAS CHARBROILER	1	174
GAS 2 BURNER HOT PLATE	1	60
RTU-1(N)	1	80
DOAS-1	1	150
TOTAL LOAD		764

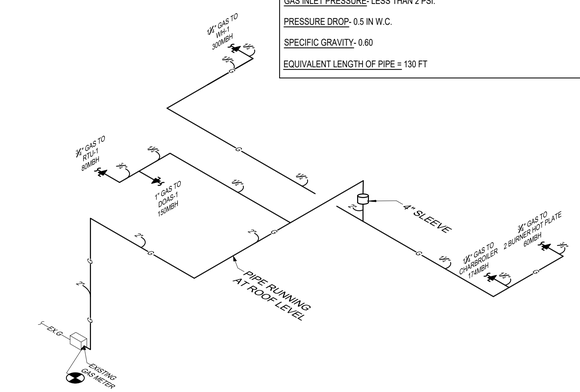
GAS PIPE SIZING PER TABLE 1215.2(3) UNIFORM PLUMBING CODE CODE (UPC 2024)

GAS INLET PRESSURE- LESS THAN 2 PSI.

PRESSURE DROP- 0.5 IN W.C.

SPECIFIC GRAVITY- 0.60

EQUIVALENT LENGTH OF PIPE = 130 FT



3 GAS RISER DIAGRAM SCALE:NTS

FLAME BROILER

PLUMBING ISOMETRIC RISERS AND SCHEDULES

P601

Property of NY Engineers

ELECTRICAL SYMBOLS LIST

LIGHTING

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

SWITCHES AND CONTROLS

$a	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE/SWITCHED RECEPTACLE CONTROLLED.
$3a	20A 3-WAY TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED
OSA	CEILING OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE. 'A' LETTER REFERES TO WIRING DIAGRAM.
PC	WALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.
$aOS	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE.
DS	CEILING MOUNTED DAYLIGHT SENSOR.
TC	TIMECLOCK
C	LIGHTING CONTRACTOR

ELECTRICAL DRAWING LIST

E001	ELECTRICAL SYMBOLS, ABBREVIATIONS & GENERAL NOTES
E002	ELECTRICAL SPECIFICATIONS (1 OF 2)
E003	ELECTRICAL SPECIFICATIONS (2 OF 2)
E100	ELECTRICAL LIGHTING PLAN
E200	ELECTRICAL POWER FLOOR & ROOF PLAN
E600	ELECTRICAL PANEL SCHEDULES AND RISER DIAGRAM
E700	ELECTRICAL DETAILS
E800	ENERGY FORMS

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE, CEILING MOUNTED..
	DUPLEX CONVENIENCE RECEPTACLE, +12" AFF OR AS NOTED.
	DOUBLE DUPLEX RECEPTACLE - 20A-1P, 125V, NEMA 5-20R.
	TELEPHONE/DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. RUN (2) COMPOSITE CABLES FROM EACH OUTLET TO NID BOX.
	DATA OUTLET - (1) PORT UNO, +18" AFF, UNO TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH 1 1/4" DIAMETER GROMMETED OPENING.

MOTORS AND CONTROLS

	NON FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
M	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
M WP	AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.
MD	MOTORIZED DAMPER.
FSD	FIRE SMOKE DAMPER
S_T	THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.
S_M	MANUAL MOTOR SWITCH
1.5 kW	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING
M M	DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.

ANNOTATION

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

POWER DISTRIBUTION

	POWER PANELBOARD, 208Y/120V-SURFACE MOUNTED.

ELECTRICAL ABBREVIATIONS

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

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE LOCAL ELECTRICAL CODE, 2023 NEC, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED 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 RAINTIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL 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.

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ELECTRICAL SYMBOLS, ABBREVIATIONS AND GENERAL NOTES

E001

ELECTRICAL SPECIFICATIONS

1. GENERAL:

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

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.

C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS FROM DRAWING MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

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

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

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

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

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

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

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

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

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

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

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

P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE. AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.

5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.

6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.

7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.

C. QUALITY ASSURANCE

1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.

2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

3) CURRENT CHARACTERISTICS:

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

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

4) HEIGHTS OF OUTLETS:

a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:

- RECEPTACLES AND TELEPHONES: 1 FT-6 IN.
- WALL SWITCHES: 4 FT-0 IN.
- WALL FIXTURES: 7 FT-0 IN.
- MOTOR CONTROLLERS: 5 FT-0 IN.
- CLOCKS: 7 FT 6 IN

b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.

2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.

2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.

- SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
- MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
- CLIP FORM NAILS FLUSH WITH INSERTS.
- MAXIMUM LOADING 75 PERCENT OF RATING.

b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.

c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.

d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

H. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

I. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE NATIONAL ELECTRICAL CODE (NEC), AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR

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

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

1) PROJECT NAME AND LOCATION

2) NAME OF ARCHITECT AND ENGINEER

3) ITEM IDENTIFICATION

4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SAFETY/DISCONNECT SWITCHES

2) FUSES

3) CIRCUIT BREAKERS

4) PANEL BOARDS/LOAD CENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).

5) RACEWAYS

6) WIRE AND CABLE

7) WALL SWITCHES

8) INSERTION RECEPTACLES

9) MOMENTARY CONTACT SWITCHES

10) TIME SWITCHES

11) LIGHTING FIXTURES.

E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

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

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

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

7. FUSES:

A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

B. MOTOR CIRCUITS - ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.

D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

8. DISTRIBUTION PANEL BOARDS, CIRCUIT BREAKER TYPE:

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

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

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

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

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

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

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

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

I. MINIMUM GUTTER SPACES: PANELS WITH 225 AMPERE MAINS, 5-¾″ MINIMUM, 400 AMPERES AND OVER, MINIMUM GUTTERS 8″, FOR PANELS WITH THROUGH FEEDERS, INCREASE GUTTER WIDTH BY 2″ MINIMUM AND PROVIDE A SHEET STEEL BARRIER BETWEEN THE PANEL GUTTER AND THE THROUGH FEEDER PORTION OF THE BACK BOX. BRANCH CIRCUIT BREAKERS SHALL BE MECHANICALLY INTERLOCKED WHEN SHOWN ON DRAWINGS.

J. DISTRIBUTION AND SUB-DISTRIBUTION PANEL BOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

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

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

9. DISTRIBUTION PANEL BOARDS, SWITCH AND FUSE:

A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.

B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.

C. PANEL BOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.

D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).

E. DISTRIBUTION PANEL BOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.

F. DISCONNECTS

1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.

2) SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANICALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.

4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1) DISTRIBUTION PANEL BOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.

2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼" HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB-DISTRIBUTION PANEL BOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANEL BOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "'OMR'', AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

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

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

M. MATERIALS

1) RACEWAYS:

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

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

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

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

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

2) FITTINGS AND ACCESSORIES:

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

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

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

d. BUSHINGS: METALLIC INSULATED TYPE.

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FLAME BROILER

ELECTRICAL SPECIFICATIONS (1 OF 2)

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ELECTRICAL SPECIFICATIONS (CONT.)

3) BOXES:

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

B. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT 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.

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

E. 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.

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

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

H. 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.

I. 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.

J. EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

K. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A NE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.

L. 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).

M. 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.

N. 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.

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

R. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

10. WIRE AND CABLE:

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

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

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

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

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

F. COLOR CODING SHALL BE AS FOLLOWS: (1) (2)

120/208 VOLT SYSTEM:	277/480 VOLT SYSTEM:
RED FOR A PHASE	BROWN FOR A PHASE
BLACK FOR B PHASE	ORANGE FOR B PHASE
BLUE FOR C PHASE	YELLOW FOR C PHASE

1) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT FOR 120/208 VOLT SYSTEM.

2) NEUTRAL WIRE SHALL UTILIZE GRAY OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT FOR 277/480 VOLT SYSTEM.

WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

G. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.

H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON RING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. PER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

I. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

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

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

PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.

11. WIRING DEVICES:

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/220 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).

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

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

2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE: TAMPER RESISTANT,

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

E. COLORS: COORDINATE COLORS WITH ARCHITECT.

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

12. LIGHTING FIXTURES:

A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.

E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.

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

G. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED. AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.

13. TELEPHONE CONDUIT SYSTEM:

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

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.

C. OUTLETS SHALL BE:

1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.

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

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.

F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.

14. PANELBOARDS:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

15. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.

B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.

C. PANELBOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.

D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).

E. DISCONNECTS

1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.

2) SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANICALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.

4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.

2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼ " HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "OMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

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

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

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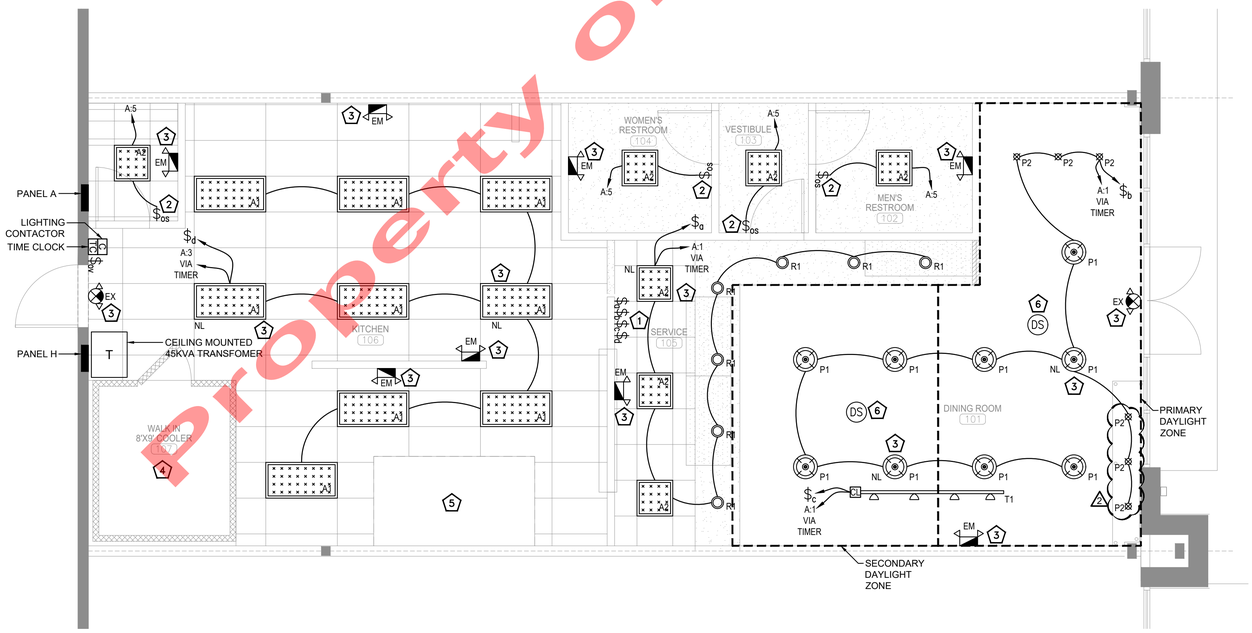
FLAME BROILER

ELECTRICAL SPECIFICATIONS (2 OF 2)

E003

LIGHTING FIXTURE SCHEDULE			
TYPE	SYMBOL	LIGHT FIXTURE DESCRIPTION	WATTAGE
A1		2x4 RECESSED LED LIGHT FIXTURE MODEL: "PHILIPS DAY BRITE 2TG54L840-4-FS-02F-UNV" OR APPROVED EQUAL	49.3W
A2		2x2 RECESSED LED LIGHT FIXTURE MODEL: "PHILIPS DAY BRITE 2TG54L840-2-FS-02F-UNV" OR APPROVED EQUAL	51.5W
P1		PENDANT LIGHT FIXTURE MODEL: "PROGRESS LIGHTING P5094-0930K9" OR APPROVED EQUAL	17W
P2	⊠	PENDANT LIGHT FIXTURE MODEL: "CHROMA PD1709-BK" OR APPROVED EQUAL	12W (2)
R1		6" RECESSED LIGHT FIXTURE MODEL: "LITHONIA LDN6 35/10MVOLTGZ10HSG" OR APPROVED EQUAL	11W
T1		TRACK LIGHT FIXTURE MODEL: "JUNO R600L-35K-BL" OR APPROVED EQUAL	9.5W
EM		2-HEAD EMERGENCY BATTERY PACK (WHITE) MODEL: "EXITRONIX EBU-W-LED-51-52" OR APPROVED EQUAL	3W
EX		COMBO LED EXIT SIGN W/LIGHT HEADS (WHITE) MODEL: "EXITRONIX VLED-U-WH-EL90" OR APPROVED EQUAL	3W

2 LIGHTING FIXTURE SCHEDULE



1 ELECTRICAL LIGHTING PLAN — SCALE: ¼"=1'-0"

GENERAL NOTES:

1. REFER TO DRAWING E001 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E002 & E003 FOR ELECTRICAL SPECIFICATIONS.
2. E.C. SHALL COORDINATE WITH ARCHITECT/ARCHITECTURE DRAWINGS FOR LIGHT FIXTURE DESCRIPTION, HEIGHTS AND LOCATION PRIOR TO ROUGH-IN.
3. E.C. TO COORDINATE WITH ARCHITECT/OWNER FOR EXACT LIGHTING CONTROL AND DIMMING REQUIREMENTS FOR ALL THE LIGHTING FIXTURES.
4. E.C. SHALL PROVIDE ADDITIONAL LIGHTING CONTROLS AS PER AHJ REQUIREMENTS IF ANY TO COMPLETE THE PERMIT REQUIREMENTS.
5. E.C. SHALL ADJUST ALL EGRESS AND EXIT SIGNS QUANTITIES AND LOCATIONS TO MEET THE AHJ REQUIREMENTS.
6. E.C. SHALL ENSURE ALL THE LIGHTING CONTROL SHALL MEET THE IECC 2024 REQUIREMENT AND LOCAL AHJ REQUIREMENTS.

KEY NOTES:

1. DIMMER SWITCH BANK. COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER. DIMMER SWITCHES SHALL BE RATED FOR TOTAL LOAD OF SWITCHED CIRCUIT AND LAMP TYPE AS REQUIRED. DIMMERS SHALL BE PROVIDED WITH AN ON/OFF SWITCH. SEE DETAIL ON THIS SHEET.
2. WALL MOUNTED OCCUPANCY SENSOR EQUAL TO WATTSTOPPER WS-250.SET OFF TIME TO 15 MINUTES FOR RESTROOM,OFFICE APPLICATIONS, SET DIP SWITCH TO AUTOMATIC ON.
3. WIRE ALL EMERGENCY, EXIT AND NIGHT LIGHT TO NEAREST LIGHTING CIRCUIT AHEAD OF ALL CONTROL & SWITCHING FOR CONTINUOUS OPERATIONS.
4. LIGHTING FIXTURES, OCCUPANCY SENSOR AND SWITCH FOR WALK-IN BOX SHALL BE PROVIDED BY WALK-IN BOX MANUFACTURER. ELECTRICAL CONTRACTOR TO PROVIDE ELECTRICAL CONNECTION TO WALK IN BOX LIGHTING AND POWER AS PER MANUFACTURER REQUIREMENT.
5. HOOD LIGHTS PROVIDED BY HOOD MANUFACTURER. ELECTRICAL CONTRACTOR TO PROVIDE POWER PROVISION FOR HOOD CONTROL PANEL.
6. E.C. SHALL PROVIDE CEILING MOUNTED DAYLIGHT SENSORS AND CONTROLS FOR DAYLIGHT ZONE LIGHTS AS PER IECC 2024. DAYLIGHT SENSOR SHALL BE COMPATIBLE WITH TIME CLOCK.

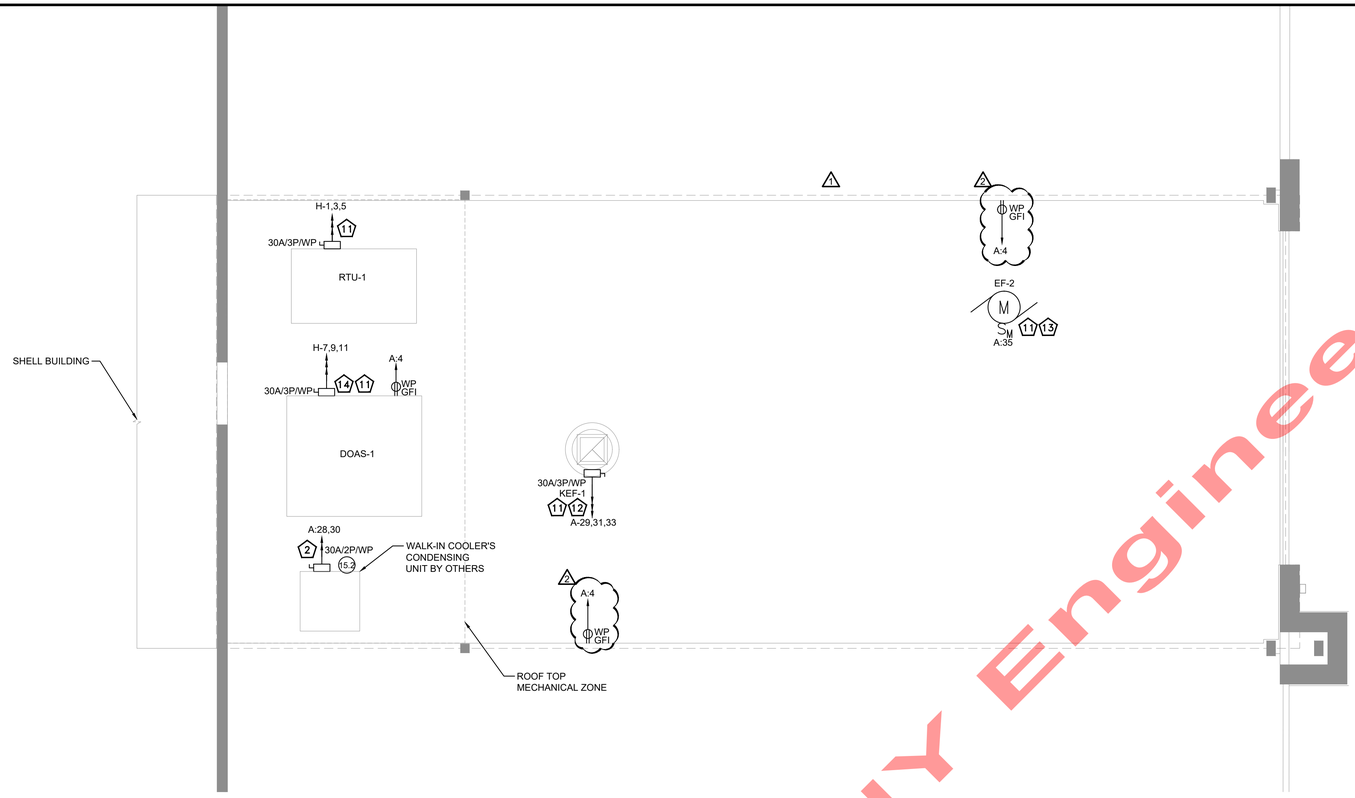
3 LIGHTING PLAN GENERAL & KEY NOTES — SCALE: NTS

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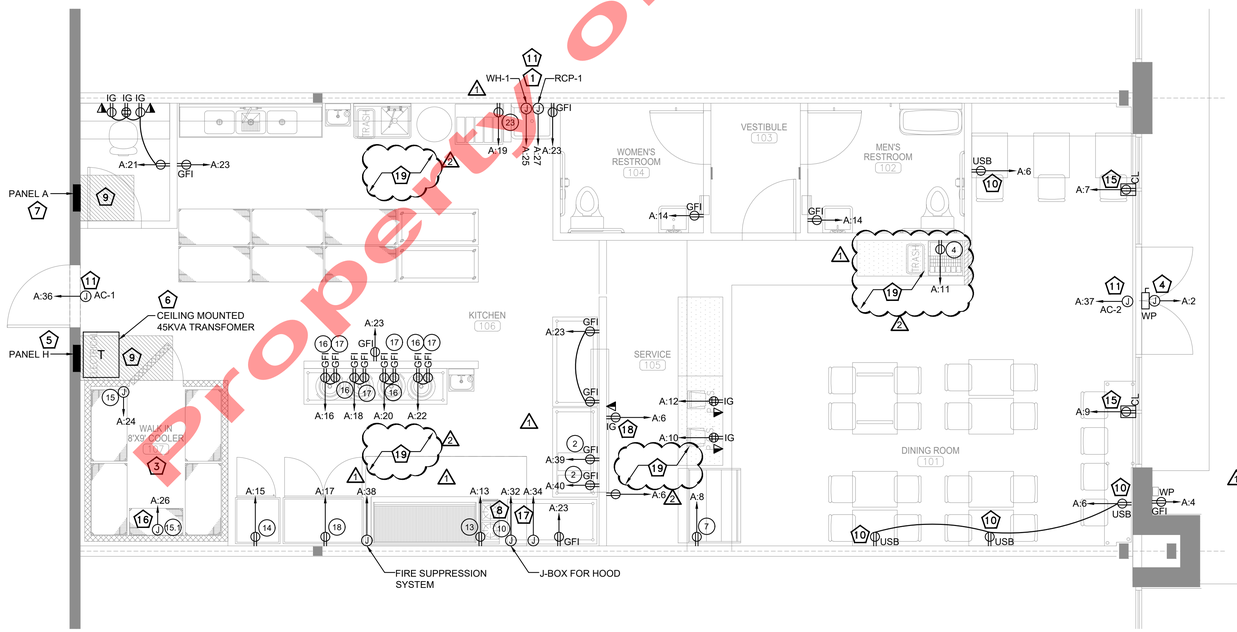
ELECTRICAL LIGHTING PLAN

E100



2 POWER ROOF PLAN

SCALE: ¼"=1'-0"



1 POWER FLOOR PLAN

SCALE: ¼"=1'-0"

GENERAL NOTES:

1. ALL RECEPTACLES IN KITCHEN AREA SHALL BE "GFI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B). PROVIDE GFI RATED BREAKER AT PANEL FOR KITCHEN EQUIPMENT.
2. SEE ARCHITECTURAL ELEVATIONS FOR PLACEMENT OF DEVICES.
3. COORDINATE EXACT LOCATION OF HVAC EQUIPMENTS ON ABOVE CEILING WITH MECHANICAL CONTRACTOR.
4. E.C. SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER FOR FINAL SELECTION PRIOR TO ROUGH-IN. E.C. SHALL COORDINATE LOCATION OF DISCONNECT SWITCH WITH MANUFACTURER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
5. E.C. SHALL VERIFY THE EXACT ELECTRICAL REQUIREMENT INCLUDING RECEPTACLE, CIRCUIT BREAKER AND CABLES FOR ALL THE KITCHEN EQUIPMENTS IN FIELD AND ACCORDINGLY PROVIDE THE ELECTRICAL CONNECTION FOR ALL KITCHEN EQUIPMENTS AS REQUIRED.
6. REFER TO ARCHITECTURE DRAWINGS FOR KITCHEN EQUIPMENT SCHEDULE. E.C. SHALL VERIFY AND PROVIDE THE EXACT ELECTRICAL REQUIREMENT INCLUDING RECEPTACLE, PLUG, CORD, CIRCUIT BREAKER AND CABLES FOR ALL THE KITCHEN/MECHANICAL EQUIPMENTS IN COORDINATION WITH EQUIPMENT SUPPLIER/MANUFACTURER IN FIELD. BASE BID ACCORDINGLY.

KEY NOTES:

1. JUNCTION BOX FOR IGNITION OF GAS FIRED WATER HEATER WITH INBUILT RCP. E.C SHALL COORDINATE EXACT LOCATION, IGNITION & ELECTRICAL REQUIREMENT WITH PLUMBING CONTRACTOR/WATER HEATER SUPPLIER/MANUFACTURER.
2. 20A/3P CIRCUIT FOR WALK-IN COOLER CONDENSER. E.C SHALL COORDINATE EXACT LOCATION AND ELECTRICAL REQUIREMENT WITH EQUIPMENT MANUFACTURER IN FIELD.
3. E.C. TO COORDINATE WITH WALK IN COOLER MANUFACTURER FOR EXACT LOCATION OF ELECTRICAL CONNECTION AND POWER SUPPLY REQUIREMENT IN FIELD AND ACCORDINGLY PROVIDE THE ELECTRICAL CONNECTION FOR WALK IN COOLER.
4. JUNCTION BOX WITH TOGGLE DISCONNECT PER NEC FOR CONNECTION TO BUILDING MOUNTED SIGNAGE. VERIFY EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURE'S/SIGN VENDOR'S INSTRUCTION. ROUTE CIRCUIT TO PANEL VIA EXTERIOR MOUNTED PHOTOCELL/TIME CLOCK.
5. NEW 125A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL PANEL 'H' FOR THE SPACE. E.C. SHALL COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER IN FIELD.
6. NEW 480-120/208V, 3-PHASE, ELECTRICAL TRANSFORMER FOR THE SPACE. E.C. SHALL COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER IN FIELD.
7. NEW 100A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL 'A' FOR THE SPACE. E.C. SHALL COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER IN FIELD.
8. E.C. SHALL PROVIDE POWER AND NECESSARY WIRING FOR THE HOOD CONTROL PANEL.
9. E.C. SHALL MAINTAIN CLEARANCE FOR ELECTRICAL PANEL AND TRANSFORMER PER NEC 110.26 (A) (1).
10. E.C. SHALL PROVIDE TAMPER-RESISTANT DUPLEX RECEPTACLE FOR DINING AREA.
11. E.C. TO COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENTS OF MECHANICAL EQUIPMENTS WITH MECHANICAL CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER FINAL MECHANICAL EQUIPMENTS REQUIREMENTS IN FIELD.
12. EXHAUST FAN FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR INTERLOCK WITH HOOD CONTROL. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR SWITCHING & CONTROLS AND PROVIDE ALL NECESSARY WIRING REQUIRED IN FIELD.
13. EXHAUST FAN FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. EXHAUST FAN EF-2 SHALL BE POWERED AND CONTROLLED ALONG WITH RTU-1. E.C. SHALL COORDINATE EXACT LOCATION WITH MECHANICAL CONTRACTOR IN FIELD.
14. DOAS UNIT FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR INTERLOCK WITH HOOD CONTROL. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR SWITCHING & CONTROLS AND PROVIDE ALL NECESSARY WIRING REQUIRED IN FIELD.
15. E.C. TO INSTALL SHOW WINDOW RECEPTACLES AS PER NEC 210.62.
16. 20A/1P CIRCUIT FOR WALK-IN COOLER EVAPORATOR. E.C SHALL COORDINATE EXACT LOCATION AND ELECTRICAL REQUIREMENT WITH EQUIPMENT MANUFACTURER.
17. J-BOX (FLUSH MOUNTED) FOR ANSUL SYSTEM PULL STATION. MAKE CONNECTION AS REQUIRED.
18. PROVIDE A RECEPTACLE & JUNCTION BOX FOR DINING TELEVISION. FIELD VERIFY EXACT MOUNTING LOCATION OF RECEPTACLE/JUNCTION BOX WITH TELEVISION/MOUNTING BRACKET IN FIELD. RECEPTACLE & JUNCTION BOX SHALL BE INSTALLED BEHIND TELEVISION CONCEALED FROM VIEW AS MUCH AS POSSIBLE.
19. ALL REQUIRED GFCI PROTECTION SHALL BE PROVIDED BY READILY ACCESSIBLE GFCI RECEPTACLES, READILY ACCESSIBLE DEAD-FRONT GFCI DEVICES, OR PANEL-MOUNTED GFCI CIRCUIT BREAKERS, IN ACCORDANCE WITH NEC 210.8 AND ARTICLE 100.

4 POWER PLAN GENERAL & KEY NOTES SCALE:NTS

EQUIPMENT SCHEDULE

EQUIPMENT TAG (#)	EQUIPMENT NAME	LOAD			VOLTS	POLE	CONNECTION TYPE (DIRECT/PLUG)	REMARK
		AMPS	WATTS	HP				
2	FOOD PAN WARMER, COUNTERTOP	10	1200	-	120	1	PLUG	NEMA 5-15P
4	SODA DISPENSER	10.7	-	-	120	1	PLUG	NEMA 5-15P
7	OPEN AIR MERCHANDISER	1.5	-	-	120	1	PLUG	
10	HOOD	-	-	-	-	-	DIRECT	
13	REFRIGERATOR BASE	2	-	-	120	1	PLUG	NEMA 5-15P
14	REACH IN FREEZER	5	-	-	120	1	PLUG	NEMA 5-15P
15	WALK-IN COOLER, DOOR AND LIGHT	15	-	-	120	1	DIRECT	
15.1	WALK-IN COOLER, EVAPORATOR COIL	0.9	-	-	120	1	DIRECT	
15.2	WALK-IN COOLER, CONDERSING UNIT	5.6	-	-	208	2	DIRECT	
16	RICE COOKER	-	1550	-	120	1	PLUG	NEMA 5-20P
17	RICE WARMER	-	100	-	120	1	PLUG	NEMA 5-15P
18	REACH IN FRIDGE	1.5	-	-	120	1	PLUG	NEMA 5-15P
23	BAG IN BOX	15	-	-	120	1	PLUG	NEMA 5-15P

3 KITCHEN EQUIPMENT SCHEDULE SCALE:NTS

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FLAME BROILER

ELECTRICAL
POWER FLOOR & ROOF PLAN

E200

PANEL:	H (NEW)											MOUNTING:	SURFACE		
480Y/277	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	106_KITCHEN		
MAIN CB:	100A	MLO:	NA	BUS:	225A	MIN,						FED FROM:	ELECTRICAL TRANSFORMER		
NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC, M : MOTOR , C:REFRIGERATION, E:KITCHEN/EQUIPMENTS, O : OTHER/MISCELLANEOUS (TYPICAL), *: GFI BREAKER															

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1			H	4.71		15.07				10.36	O			2
3	3P-20	RTU-1	H	4.71	3#12, #12G, 3/4"C		16.35		3#4, #8G, 1"C	11.64	O	45KVA TRANSFOMER (PANEL A)	3P-80	4
5			H	4.71				14.25		9.54	O			6
7			H	7.87		7.87						SPARE	20	8
9	3P-30	DOAS-1	H	7.87	3#10, #10G, 3/4"C		7.87					SPARE	20	10
11			H	7.87				7.87				SPARE	20	12
13	20	SPARE				0.00						SPARE	20	14
15	20	SPARE					0.00					SPARE	20	16
17	20	SPARE						0.00				SPARE	20	18
TOTAL CONNECTED LOAD (KVA)						22.94	24.22	22.12						

LOAD CLASSIFICATION		CONNECTED LOAD (KVA)	DEMAND FACTOR	DEMAND LOAD (KVA)
LIGHTING	L	0.00	125%	0.00
RECEPTACLE	R	0.00	100%	0.00
HVAC	H	37.74	100%	37.74
MOTOR	M	0.00	100%	0.00
REFRIGERATION	C	0.00	100%	0.00
KITCHEN/EQUIPMENTS	E	0.00 ⚠1	65%	0.00 ⚠1
OTHER/MISCILLANEOUS	O	31.54	100%	31.54

PANEL TOTAL LOAD ⚠1	
TOTAL CONNECTED LOAD	69.28 KVA
TOTAL DEMAND LOAD	69.28 KVA
TOTAL CONNECTED CURRENT	83.43 AMP
TOTAL DEMAND CURRENT	83.43 AMP

⚠2

PANEL:	A (NEW)											MOUNTING:	SURFACE		
208Y/120	VOLTS,	3	PHASE,	4	WIRE							PANEL LOCATION:	106_KITCHEN		
MAIN CB:	100A	MLO:	NA	BUS:	100A	MIN,						FED FROM:	ELECTRICAL TRANSFORMER		
NOTE: L : LIGHTING, R : RECEPTACLES, H : HVAC, M : MOTOR , C:REFRIGERATION, E:KITCHEN/EQUIPMENTS, O : OTHER/MISCELLANEOUS (TYPICAL), *: GFI BREAKER															

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	DINING AREA LIGHTING	L	0.49	2#12, #12G, 3/4"C	1.69			2#12, #12G, 3/4"C	⚠1 1.20	L	BUILDING SIGNAGE	20	2
3	20	KITCHEN AREA LIGHTING	L	⚠2 0.44	2#12, #12G, 3/4"C		1.16		2#12, #12G, 3/4"C	0.72	R	EXTERIOR AND ROOF RECEPTACLE	20	4
5	20	OFFICE AND RESTROOM LIGHTING	L	0.21	2#12, #12G, 3/4"C			1.11	2#12, #12G, 3/4"C	0.90	R	DINING AREA RECEPTACLE	20	6
7	20	SHOW WINDOW RECEPTACLE	R	1.24	2#12, #12G, 3/4"C	1.42			2#12, #12G, 3/4"C	0.18	E	7_OPEN AIR MERCHANDISER	20	8
9	⚠1 20	SHOW WINDOW RECEPTACLE	R	1.24	2#12, #12G, 3/4"C		1.60		2#12, #12G, 3/4"C	0.36	R	POS-1	20	10
11	20*	4_SODA DISPENSER	E	1.28	2#12, #12G, 3/4"C			1.64	2#12, #12G, 3/4"C	0.36	R	POS-2	20	12
13	20*	13_REFRIGERATOR BASE	E	0.24	2#12, #12G, 3/4"C	0.60			2#12, #12G, 3/4"C	0.36	R	RESTROOMS RECEPTACLE	20	14
15	20*	14_REACH IN FREEZER	E	0.60	2#12, #12G, 3/4"C		2.25		2#12, #12G, 3/4"C	1.65	E	16&17_RICE COOKER & WARMER #1	20	16
17	20*	18_REACH IN FRIDGE	E	0.18	2#12, #12G, 3/4"C			1.83	2#12, #12G, 3/4"C	1.65	E	16&17_RICE COOKER & WARMER #2	20	18
19	20*	23_BAG IN BOX	E	1.80	2#12, #12G, 3/4"C	3.45			2#12, #12G, 3/4"C	1.65	E	16&17_RICE COOKER & WARMER #3	20	20
21	20	OFFICE RECEPTACLE	R	0.90	2#12, #12G, 3/4"C		2.55		2#12, #12G, 3/4"C	1.65	E	16&17_RICE COOKER & WARMER #4	20	22
23	20	KITCHEN AREA GENERAL RECEPTACLE	R	1.08	2#12, #12G, 3/4"C			2.88	2#12, #12G, 3/4"C	1.80	O	15_WALK-IN COOLER DOOR & LIGHTS	20*	24
25	20*	IGNITION FOR GAS WATER HEATER (WH-1)	O	0.48	2#12, #12G, 3/4"C	0.59			2#12, #12G, 3/4"C	0.11	C	15.1_WALK-IN COOLER EVAPORATOR	20*	26
27	20*	RCP-1	O	0.10	2#12, #12G, 3/4"C		0.68		2#12, #12G, 3/4"C	0.58	C	15.2_WALK-IN COOLER CONDERSER	2P-20	28
29			H	0.79				1.37		0.58	C			30
31	3P-20	KEF-1	H	0.79	2#12, #12G, 3/4"C	1.79			2#12, #12G, 3/4"C	1.00	O	JUNCTION BOX FOR HOOD CONTROL PANEL	20*	32
33			H	0.79			0.99		2#12, #12G, 3/4"C	0.20	O	ANSUL SYSTEM	20	34
35	20	EF-2	M	0.42	2#12, #12G, 3/4"C			0.71	2#12, #12G, 3/4"C	0.29	H	AIR CURTAIN (AC-1)	20	36
37	⚠1 20	AIR CURTAIN (AC-2)	H	0.31	2#12, #12G, 3/4"C	0.81			2#12, #12G, 3/4"C	0.50	O	FIRE SUPPRESSION SYSTEM	20*	38
39	20	FOOD PAN WARMER #1	E	1.20	2#12, #12G, 3/4"C		2.40		2#12, #12G, 3/4"C	1.20	E	FOOD PAN WARMER #2	20	40
41	20	SPARE						0.00				SPARE	20	42
TOTAL CONNECTED LOAD (KVA)						10.36	11.64	9.54						

LOAD CLASSIFICATION		CONNECTED LOAD (KVA)	DEMAND FACTOR	DEMAND LOAD (KVA)
LIGHTING	L	2.34	125%	2.93
RECEPTACLE	R	7.16	100%	7.16
HVAC	H	2.98	100%	2.98
MOTOR	M	0.42	100%	0.42
REFRIGERATION	C	1.27 ⚠1	100%	1.27 ⚠1
KITCHEN/EQUIPMENTS	E	13.28	65%	8.63
OTHER/MISCILLANEOUS	O	4.08	100%	4.08

PANEL TOTAL LOAD ⚠1	
TOTAL CONNECTED LOAD	31.54 KVA
TOTAL DEMAND LOAD	27.48 KVA
TOTAL CONNECTED CURRENT	87.65 AMP
TOTAL DEMAND CURRENT	76.35 AMP

⚠2

ELECTRICAL LOAD SUMMARY

DESCRIPTION	CONNECTED KVA	VOLT	PHASE	DEMAND FACTOR	DEMAND KVA
LIGHTING	2.3	120	1	1.25	2.9
RECEPTACLES	7.2	120	1	>10kW=10+[0.5*(kW-10)]	7.2
HVAC	40.7	208	3	1.00	40.7
MOTOR	0.4	120	1	1.00	0.4
REFRIGERATION	1.3 ⚠1	208	1	0.65	0.8 ⚠1
KITCHEN EQUIPMENTS	13.3	208	3	0.65	8.6
OTHERS/MISCILLANEOUS	4.1	208	1	1.00	4.1
TOTAL	69.3				64.8

NOTES:

* USE GREATER VALUE OF THE TWO CATEGORIES.

** 125% OF THE LARGEST MOTOR OR COMPRESSOR IN SYSTEM APPLIED ONLY ON ONE UNIT.

*** N.E.C. ARTICLE 220-12 REQUIREMENT (200 VA PER FOOT OF SHOW WINDOW) MINUS ACTUAL SHOW WINDOW LIGHTING kVA.

N.E.C. DEMAND kVA x 1,000 / 1.73 = MINIMUM FEEDER AMPERAGE ⚠1

64.8 / 480 x 1000 = 64,774 / x 1.732 = 831 — 77.9 AMPS — USE (NEW) 100AMP SERVICE.

PANEL BOARD GENERAL NOTES:

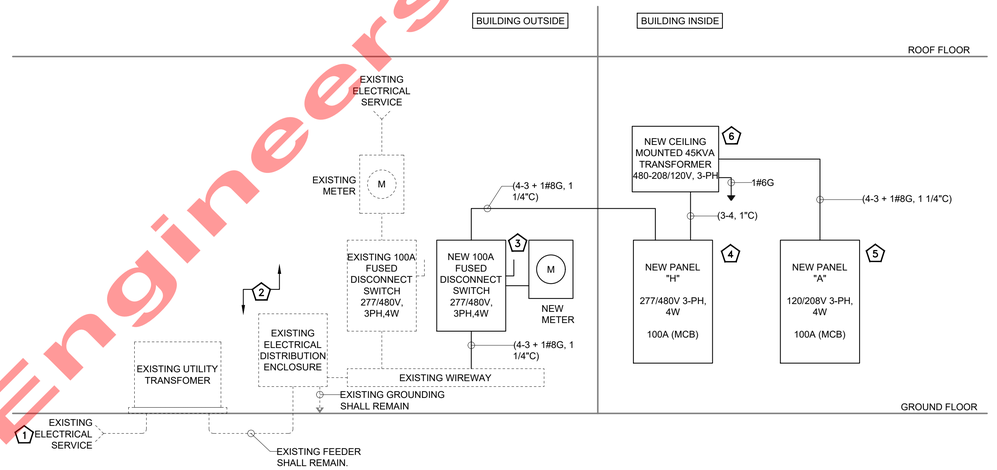
1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY EXACT BREAKER, CABLE, ELECTRICAL LOAD AND CONDUIT REQUIREMENTS/SIZES/RATINGS WITH EQUIPMENT/APPLIANCES/MECHANICAL EQUIPMENT SUPPLIER/MANUFACTURER IN COORDINATION WITH ARCHITECT/OWNER IN FIELD. E.C. SHALL PROVIDE THE CIRCUIT BREAKER, CABLE AND ALL REQUIRED ACCESSORIES/DEVICE IN ORDER TO RUN ALL THE STORE EQUIPMENTS/APPLIANCES/DEVICES IN FIELD. BASE BID ACCORDINGLY.
2. REFER TO ARCHITECTURE DRAWINGS FOR KITCHEN EQUIPMENT SCHEDULE. INFORM ENGINEER FOR ANY DISCREPANCIES. BASE BID ACCORDINGLY.
3. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE IN FIELD.
4. ALL 125-VOLT THROUGH 250-VOLT RECEPTACLES SUPPLIED BY SINGLE-PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 50 AMPERES OR LESS, AND ALL RECEPTACLES SUPPLIED BY THREE-PHASE BRANCH CIRCUITS RATED 150 VOLTS OR LESS TO GROUND, 100 AMPERES OR LESS, INSTALLED IN THE LOCATIONS SPECIFIED IN 210.8(B) SHALL BE WITH GFCI PROTECTION.
5. E.C. SHALL VERIFY THE BREAKER AND CABLE RATING WITH EQUIPMENT SUPPLIER/OWNER AND ACCORDINGLY UPDATE THE BREAKER RATING AND CABLE SIZE IN FIELD.

2 ELECTRICAL PANEL SCHEDULE — SCALE: NTS

NOTE: SUBMIT RISER DIAGRAM TO AUSTIN ENERGY. AUSTIN ENERGY WILL NEED TO PROVIDE AN APPROVED ESPA.

TENANT CONTRACTOR AND ELECTRICAL CONTRACTOR TO DISCUSS ROUTING AND EXACT LOCATION OF ELECTRICAL GEAR WITH LANDLORD PRIOR TO STARTING THIS WORK.

ELECTRICAL RISER SYMBOL
- NEW
- EXISTING ITEM/FEEDER TO REMAIN
- EXISTING ITEM/FEEDER TO BE DISCONNECTED & REMOVED



RISER DIAGRAM KEYED WORK NOTES: (#)

1. EXISTING 277/480V, 3-PHASE ELECTRICAL SERVICE SHALL REMAIN FOR THE PROJECT SPACE. E.C. SHALL VERIFY EXACT RATING VOLTAGE, AMPERAGE, PHASE, OPERABLE CONDITION AND LOCATION OF SERVICE IN FIELD. REPORT TO ENGINEER ON RECORD FOR ANY DISCREPACIES. PROVIDE NEW IF FOUND IN-OPERABLE OR INSUFICIENT. BASE BID ACCORDINGLY.
2. E.C. SHALL COORDINATE WITH BASE BUILDING/LANDLORD/OWNER FOR EXACT POWER DISTRIBUTION, RATING, VOLTAGE, PHASE,LOCATION AND OPERABLE CONDITION PRIOR TO COMMENCING ANY WORK. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCIES. BASE BID ACCORDINGLY.
3. NEW 100A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL METER & DISCONNECT SWITCH FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.
4. NEW 100A, 277/480V, 3-PHASE 4-WIRE ELECTRICAL PANEL "H" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF ELECTRICAL PANEL "H" IN FIELD.
5. NEW 100A, 120/208V, 3-PHASE 4-WIRE ELECTRICAL PANEL "A" FOR THE PROJECT SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF ELECTRICAL PANEL "A" IN FIELD.
6. NEW 480-208/120V, 3-PHASE 45 KVA FLOOR MOUNTED TRANSFORMER FOR THE PROJECT SPACE. ELECTRICAL CONTRACTOR TO COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION AND REQUIREMENT OF TRANSFORMER IN FIELD.

RISER DIAGRAM GENERAL NOTES:

1. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSES ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD AND INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY.
2. E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.
3. ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
4. E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION & INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.
5. E.C. SHALL COORDINATE WITH UTILITY COMPANY/OWNER FOR EXACT ELECTRICAL SERVICE EQUIPMENT REQUIREMENTS AND DETAILS OF INSTALLATION IN FIELD AND ACCORDINGLY CONSIDER UTILITY APPROVED SERVICE EQUIPMENTS IN FIELD. BASE BID ACCORDINGLY.
6. IT IS THE ELECTRICAL CONTRACTOR'S RESPONSIBILITY TO PROPERLY BALANCE ALL BRANCH CIRCUITS BETWEEN THE PHASES (WITHIN 10% OF EACH) OF THE SYSTEM REGARDLESS OF THE CIRCUITING INDICATED.

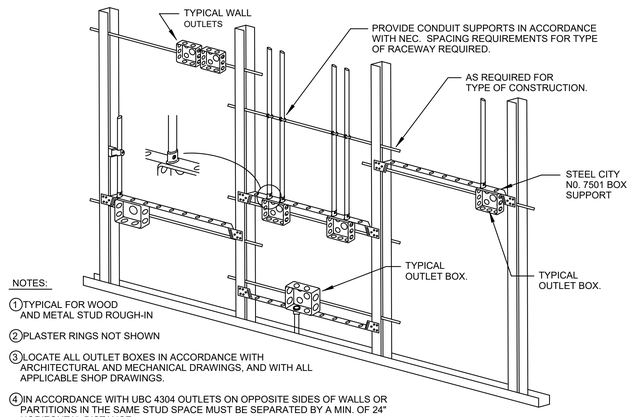
1 ELECTRICAL RISER DIAGRAM — SCALE: NTS

FLAME BROILER

ELECTRICAL PANEL SCHEDULE & RISER DIAGRAM

E600

Property of TRY Engineers

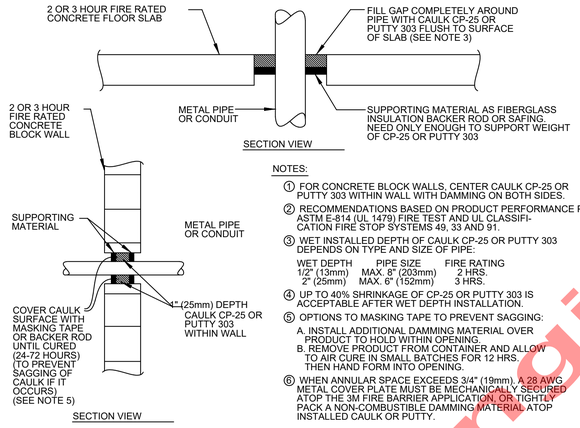


NOTES:

1. TYPICAL FOR WOOD AND METAL STUD ROUGH-IN
2. PLASTER RINGS NOT SHOWN
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.
4. IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

1 DETAIL TYPICAL ROUGH-IN REQUIREMENTS

SCALE: NTS



NOTES:

1. FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.
2. RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFICATION FIRE STOP SYSTEMS 49, 33 AND 91.
3. WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:

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

4. UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.
5. OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
   A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
   B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.
6. WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm), A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON-COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.

2 FIRE STOP DETAIL

SCALE: NTS

MANUAL MODE OPERATION:

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

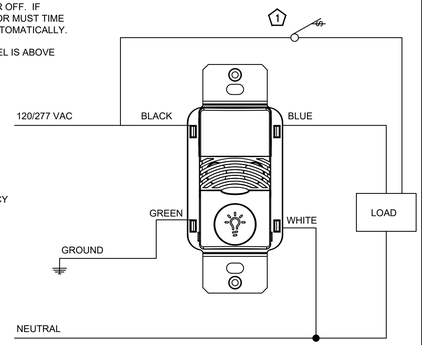
AUTOMATIC MODE OPERATION:

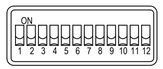
1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. PUSHBUTTON CAN BE USED TO TURN LOAD ON OR OFF. IF PUSHBUTTON IS USED TO TURN LOAD OFF, SENSOR MUST TIME OUT FIRST, BEFORE LOAD CAN TURN BACK ON AUTOMATICALLY.
3. IF DAYLIGHT SENSOR IS ENABLED AND LIGHT LEVEL IS ABOVE SETPOINT, LOAD WILL NOT TURN ON.

SENSOR TYPES INCLUDE:

ONW-D-1001-MV-N

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

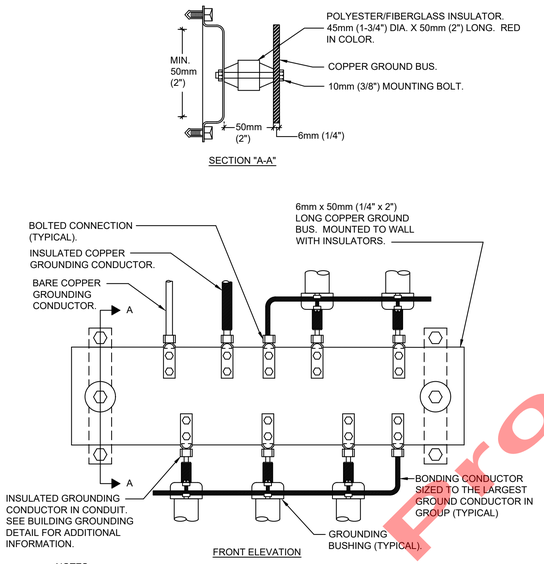




(ONW-D-1001-MV-N SENSORS)
3
ON (UP) = MANUAL ON
OFF (DOWN) = AUTO ON

3 CONNECTION OCCUPANCY/VACANCY-WIRING DIAGRAM

SCALE: NTS

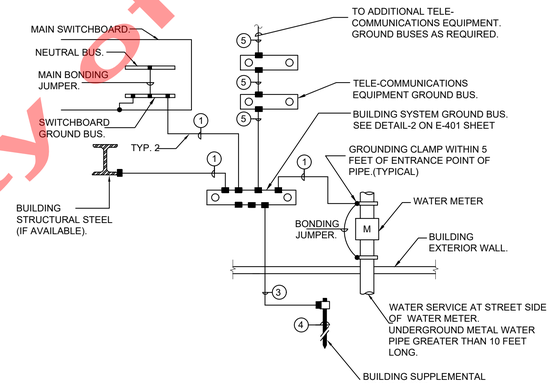


NOTES:

1. REFER TO BUILDING GROUNDING ELECTRODE SYSTEM DETAIL FOR EXACT CONFIGURATION.

4 BUILDING ELECTRICAL SYSTEMS GROUND BUS

SCALE: NTS



LEGEND:

- ● INDICATES BOLTED CONNECTION.
- ■ INDICATES EXOTHERMIC WELD CONNECTION, COMPATIBLE WITH MATERIALS BEING JOINED.

(1) INSULATED COPPER GROUNDING ELECTRODE CONDUCTOR IN CONDUIT SIZED AS PER NEC ARTICLE 250.66.
(2) INSULATED COPPER GROUNDING ELECTRODE CONDUCTOR ENCASED IN CONCRETE SIZED AS PER NEC ARTICLE 250.66
(3) 1/0 AWG BARE COPPER GROUND CONDUCTOR.
(4) 3/4" x 10'-0" LONG COPPER-CLAD GROUND ROD DRIVEN WITH TOP 12" BELOW GRADE.
(5) 2 AWG INSULATED COPPER GROUND CONDUCTOR IN 30mm CONDUIT.

5 BUILDING GROUNDING ELECTRODE SYSTEM

SCALE: NTS

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FLAME BROILER

ELECTRICAL DETAILS

E700

COMcheck-Web™

Compliance Certificate

Project Information

Energy Code:	2024 IECC
Project Title:	Flame Broiler_Austin, TX
Location:	Austin, Texas
Climate Zone:	2a
Project Type:	New Construction
Project No:	53610
Project Sub Type:	New Building/Complete
All Electric:	false
Is Renewable:	false
Has Battery:	false
Has Charger:	false
Has Heat Pump	false

Construction Site: **Owner/Agent:** **Designer/Contractor:**

Notes:

Renewable energy

Number of Floors:	1
Area of Three Largest Floors:	1456
Proposed Capacity:	0
Required Capacity:	1092
Proposed Off-site Energy:	0
Required Off-site Energy:	0
Exception:	None

Renewables Pass

Building Area

Description	Floor Area
1-Dining: Cafeteria/Fast Food (Dining: Cafeteria/Fast Food) : Nonresidential	1456

Interior Lighting Compliance Certificate

Project Information

Energy Code:	2024 IECC
Project Title:	Flame Broiler_Austin, TX
Location:	Austin, Texas
Climate Zone:	2a
Project Type:	New Construction

Construction Site: **Owner/Agent:** **Designer/Contractor:**

3500 E PARMER LN
AUSTIN , Texas 78754

MICHAEL TOBIAS
NY ENGINEERS
MIAMI , Florida 49674

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-101_DINING ROOM (Common Space Types:Dining area)	424	0.42	178.08
2-102 & 104_RESTROOM (Common Space Types:Restrooms)	131	0.74	96.94
3-103_VESTIBULE (Common Space Types:Corridor <8 ft wide)	37	0.44	16.28
4-105 & 106 (Common Space Types:Food preparation area)	826	1.19	982.94
5-108_OFFICE (Common Space Types:Office - enclosed)	38	0.73	27.74
Total Allowed Watts:			1302

Proposed Interior Lighting Power

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/Fixture	C # of Fixture	D Fixture Watt.	E (C X D)
1-101_DINING ROOM (Common Space Types:Dining area)				
P1: P1: LED:	0	9	17	153
P2: P2: LED:	0	3	11	33
T1: T1: Track Lighting: Wattage based on total luminaires	0	0	38	38
2-102 & 104_RESTROOM (Common Space Types:Restrooms)				
A2: A2: LED:	0	2	51.5	103
3-103_VESTIBULE (Common Space Types:Corridor <8 ft wide)				
A2: A2: LED:	0	1	51.5	51.5
4-105 & 106 (Common Space Types:Food preparation area)				
A1: A1: LED:	0	9	49.3	443.7
A2: A2: LED:	0	3	51.5	154.5
R1: R1: LED:	0	7	11	77
5-108_OFFICE (Common Space Types:Office - enclosed)				
A2: A2: LED:	0	1	51.5	51.5
Total Proposed Watts:				1105.2

Proposed Interior Lighting Controls

Fixture	Lighting Control
1-101_DINING ROOM (Common Space Types:Dining area)	
P1: P1: LED:	Interior Timeswitch, Manual Control
P2: P2: LED:	Interior Timeswitch, Manual Control
T1: T1: Track Lighting: Wattage based on total luminaires	Interior Timeswitch, Manual Control
2-102 & 104_RESTROOM (Common Space Types:Restrooms)	
A2: A2: LED:	Occupancy Sensor, Manual Control
3-103_VESTIBULE (Common Space Types:Corridor <8 ft wide)	
A2: A2: LED:	Occupancy Sensor, Manual Control
4-105 & 106 (Common Space Types:Food preparation area)	
A1: A1: LED:	Interior Timeswitch, Manual Control
A2: A2: LED:	Interior Timeswitch, Manual Control
R1: R1: LED:	Interior Timeswitch, Manual Control
5-108_OFFICE (Common Space Types:Office - enclosed)	
A2: A2: LED:	Occupancy Sensor, Manual Control

Interior Lighting PASSES: Design 15% better than code

Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2024 IECC requirements in COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name - Title **Signature** **Date**

Inspection Checklist

Energy Code: 2024 IECC

Requirements: 100% were addressed directly in the COMcheck software

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

Plan Review

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C408.2 [PR3]*	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and which demonstrate that the lighting standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E100, E200 & E600

Additional Comments/Assumptions:

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

Rough-In Electrical Inspection

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.1, C405.2.1.1 [EL7]*	Occupancy sensors installed in classrooms/lecture/training rooms, computer rooms/data center, conference/meeting/multipurpose rooms, copy/print rooms, lounge/breakrooms, employee cafeterias, private offices, laundry areas, open plan office areas, restrooms, storage rooms, telemedicine rooms, locker rooms, corridors, warehouse storage areas, and other spaces <= 300 sqft that are enclosed by floor-to-ceiling height partitions.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E100
C405.7 [EL3]*	Low-voltage dry-type distribution electric transformers meet the minimum efficiency requirements of Table C405.6.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.8 [EL4]*	Electric motors meet the minimum efficiency requirements of Tables C405.7(1) through C405.7(3) as determined by the motor certification under an approved certification program or the equipment efficiency ratings shall be provided by motor manufacturer (where certification programs do not exist).	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.10 [EL1]*	Total voltage drop across the combination of feeders and branch circuits <= 5%.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E600
C405.10.1, C405.10.2 [EL5]*	Escalators and moving walks comply with ASME A17.1/CSA B44 and have automatic controls configured to reduce speed to the minimum permitted speed in accordance with ASME A17.1/CSA B44 or applicable local code when not conveying passengers.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.12, C405.12.1 [EL6]*	50% of 15/20 amp receptacles installed in enclosed offices, conference rooms, copy rooms, break rooms, classrooms and workstations and > 25% of branch circuit feeders serving modular furniture will have automatic receptacle control in accordance with C405.11.1.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.2.1.2 [EL8]*	Occupancy sensors control function in warehouses: In warehouses, the lighting in aisleways and open areas is controlled with occupancy sensors that reduce the general lighting power by 50% or more within 20 minutes of when the areas are unoccupied. The occupant sensors control lighting in each aisleway independently and do not control lighting beyond the aisleway being controlled by the sensor. Lights not turned on by occupant sensors is done so by time-switch.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.2.1.3 [EL9]*	Occupant sensor control function in open plan office areas: Occupant sensor controls in open office areas <= 300 sq.ft. have all luminaires 1) configured so that general lighting can be controlled separately in control zones with floor areas <= 600 sq.ft. within the space, 2) general lighting in each zone permitted to turn on upon occupancy or manual on, 3) automatically turn off general lighting in all control zones within 20 minutes after all occupants have left the space, 4) are configured so that general lighting power in each control zone is reduced by >= 80% of the full zone general lighting power within 20 minutes of all occupants leaving that control zone.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Requirement does not apply.
C405.2.10, C405.2.10.1, C405.2.10.2 [EL10]*	Sleeping or dwelling units provided with lighting controls	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Exception:** Lighting zones < 1.5 footcandles.

Section # & Req.ID	Rough-In Electrical Inspection	Complies?	Comments/Assumptions
C405.2.2, C405.2.2.1 [EL11]*	Each area not served by occupancy sensors (per C405.2.1.1) have time-switch controls and functions detailed in sections C405.2.2.1.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E100
C405.2.3.1 [EL12]*	Spaces required to have dimming controls have a manual control that allows the occupant to reduce the connected lighting load to 10% of full power.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E100
C405.2.4, C405.2.4.1, C405.2.4.2 [EL13]*	Daylight zones provided with individual controls that control the lights independent of general area lighting. See code section C405.2.3 Daylight responsive controls for specific requirements. See C405.2.3.1 Daylight responsive control function and section C405.2.3.2 Sidelit zone.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E100
C405.2.5 [EL14]*	Additional interior lighting power allowed for special functions per the approved lighting plans and is automatically controlled and separated from general lighting.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E100

Additional Comments/Assumptions:

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

Final Inspection

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C408.1.1 [FI56]*	Building operations and maintenance documents were provided to the owner. Documents will cover manufacturers' information, specifications, programming procedures and means of illustrating to owner how building, equipment and systems are intended to be installed, maintained, and operated.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.2.5 [FI76]*	Furnished as-built drawings for electric power systems within 90 days of system acceptance.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	
C408.3 [FI4]*	Lighting systems and receptacle controls have been tested to ensure proper calibration, adjustment, programming, and operation in accordance with C408.3.1 through C408.3.1.6.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	**Location on plans/spec:** E001, E002 & E003
C408.3.2.2 [FI77]*	Furnished O&M instructions for systems and equipment to the building owner or designated representative.	☐ Complies ☐ Does Not Comply ☐ Not Observable ☐ Not Applicable	

Additional Comments/Assumptions:

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

Property of NY Engineers

FLAME BROILER

ENERGY FORMS

E800