MECHANICAL SYMBOLS LIST

AC-1 TXF-1	EQUIPMENT TAG
XX / X	RISER SYMBOL
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	RETURN GRILLE
	EXHAUST GRILLE
DUCT ACCESSORIES	
GD	GRAVITY BACKDRAFT DAMPER
VD VD	VOLUME DAMPER W/ ACCESS DOOR
	FIRE DAMPER
CONTROLS AND SENSORS	
T	THERMOSTAT
S	TEMPERATURE SENSOR
S D	SMOKE DETECTOR
DUCTWORK	
	NEW SHEET METAL DUCTWORK
	SUPPLY OR OUTSIDE AIR DUCT CROSS SECTION
	RETURN AIR DUCT CROSS SECTION
	DUCTWORK TRANSITION
	SUPPLY DUCT ELBOW UP OR DOWN
	RETURN DUCT ELBOW UP OR DOWN
	DUCT ELBOW WITH FIXED TURNING VANES
	DUCT BRANCH TAKE-OFF
	FLEXIBLE DUCTWORK
	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE DUCT
FC FC	FLEXIBLE CONNECTION
S	ROUND DUCT CROSS SECTION

MECHANICAL SHEET LIST

SHEET NUMBER	SHEET NAME
M0.1	MECHANICAL COVER SHEET
M0.2	MECHANICAL SPECIFICATIONS
M1.0	MECHANICAL FLOOR AND ROOF PLAN
M2.0	MECHANICAL DETAILS (1 OF 2)
M2.1	MECHANICAL DETAILS (2 OF 2)
M3.0	MECHANICAL SCHEDULES
M4.0	ENERGY COMPLIANCE

APPLICABLE BUILDING CODES

- INTERNATIONAL BUILDING CODE, 2021
- INTERNATIONAL MECHANICAL CODE, 2021
- INTERNATIONAL ENERGY CONSERVATION CODE, 2021

ENERGY CODE COMPLIANCE

TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE INTERNATIONAL ENERGY CONSERVATION CODE, 2021.

MECHANICAL ABBREVIATIONS

AC	AIR CURTAIN
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
GD	GRAVITY DAMPER
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
C.O.	CLEAN OUT
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CD	CONDENSATE DRAIN PIPE
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EG	EXHAUST GRILLE
FC	FLEXIBLE CONNECTION
FD/AD	FIRE DAMPER W/ACCESS DOOR
FD	FIRE DAMPER W/FUSIBLE LINK
FSD	FIRE SMOKE DAMPER
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
HWHT	HOT WATER HEATER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
MD	MOTORIZED DAMPER
RTU	ROOF TOP UNIT
RG	RETURN GRILLE
SAR	SUPPLY AIR REGISTER
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SG	SUPPLY GRILLE
VD	VOLUME DAMPER
W.M.S.	WIRE MESH SCREEN

APPLICABLE BUILDING DEPARTMENT NOTES

1. ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE INTERNATIONAL BUILDING CODE (IBC), 2021, AND ALL OTHER APPLICABLE LOCAL AND STATE CODES.

2. TESTING OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE INTERNATIONAL MECHANICAL CODE (IMC), 2021, INCLUDING BUT NOT LIMITED TO:

   A. VENTILATION SYSTEM BALANCING – IMC SECTION 403
   B. SMOKE CONTROL SYSTEMS – IMC SECTION 513

3. THE FOLLOWING COMPONENTS AND SYSTEMS SHALL CONFORM TO THE REFERENCED CODE SECTIONS OR APPLICABLE STANDARDS:

   A. STANDARDS OF HEATING – IMC SECTION 309
   B. DUCT CONSTRUCTION AND INSTALLATION – IMC SECTION 603
   C. AIR INTAKES AND EXHAUST OPENINGS – IMC SECTION 401.4
   D. AIR FILTERS – IMC SECTION 605
   E. FIRE AND SMOKE DAMPERS – IMC SECTIONS 606 & 607
   F. SMOKE CONTROL SYSTEMS – IMC SECTION 513
   G. PIPING AND INSULATION – IMC CHAPTER 12

4. THE MINIMUM TEMPERATURE MAINTAINED IN OCCUPIED SPACES DURING THE HEATING SEASON SHALL BE 68°F (20°C), AS REQUIRED BY IMC SECTION 309.1.

5. VENTILATION FOR ALL SPACES SHALL COMPLY WITH IMC CHAPTER 4.

6. A STATEMENT SHALL BE PROVIDED BY THE OWNER OR RESPONSIBLE PARTY CONFIRMING THAT THE VENTILATION SYSTEM WILL BE MAINTAINED IN CONTINUOUS OPERATION DURING OCCUPANCY, AS REQUIRED BY IMC SECTION 403.3.

7. ALL FIRE DAMPERS SHALL BE LISTED AND LABELED IN ACCORDANCE WITH UL 555 AND INSTALLED PER IMC SECTION 607 AND MANUFACTURER'S INSTRUCTIONS.

8. COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS SHALL BE LISTED IN ACCORDANCE WITH UL 555S AND INSTALLED IN ACCORDANCE WITH IMC SECTION 607.

9. CEILING RADIATION DAMPERS SHALL BE LISTED IN ACCORDANCE WITH UL 555C AND INSTALLED IN FIRE-RESISTANT CEILING ASSEMBLIES IN ACCORDANCE WITH IMC SECTION 607.6.2.

10. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS AND TYPES OF REQUIRED FIRE-RATED WALLS AND SMOKE PARTITIONS.

11. THESE PLANS ARE APPROVED ONLY FOR THE SCOPE OF WORK INDICATED ON THE PERMIT APPLICATION. ALL OTHER CONDITIONS, ELEMENTS, OR SYSTEMS NOT COVERED IN THIS REVIEW ARE SUBJECT TO FIELD INSPECTION AND VERIFICATION FOR CODE COMPLIANCE.

GENERAL NOTES

1. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTALLATION INSTRUCTIONS.

2. THE MECHANICAL EQUIPMENT HAS BEEN COORDINATED WITH THE ELECTRICAL DESIGN DRAWINGS BASED ON THE ELECTRICAL CHARACTERISTICS OF THE EQUIPMENT SPECIFIED.

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.DO NOT SCALE DRAWINGS.

4. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.

5. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.

6. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRICAL CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.

7. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.

8. LOCATE ALL TEMPERATURE AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UPSTREAM AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.

9. 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 EQUIVALENT FIRE-RATED CAPACITY (1 HR, 2 HR, ETC.) AS THE WALL.

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

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

THERMOSTATIC CONTROLS (IECC 2021):

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 BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.

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

C403.4.1.3 SETPOINT OVERLAP RESTRICTION
WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

C403.4.2 OFF-HOUR CONTROLS
EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.
EXCEPTIONS:
ZONES THAT WILL BE OPERATED CONTINUOUSLY.
ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.

403.4.2.1 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).

403.4.2.2 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 AND STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE AUTOMATIC START 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. AUTOMATIC STOP CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM WITH DIRECT DIGITAL CONTROL OF INDIVIDUAL ZONES. THE AUTOMATIC STOP CONTROLS SHALL BE CONFIGURED TO REDUCE THE HVAC 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.

DAILY PERKS

	DATE	REVISION
2	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS

DATE: 09-10-2025
CONTENTS: MECHANICAL COVER SHEET

M0.1

HVAC DUCTWORK - SHEET METAL

1. PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.

2. SUPPLY AND RETURN DUCTWORK 10' FROM ALL AC UNITS SHALL BE LINED WITH 1" ACOUSTICAL LINING.

3. 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.

4. 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.

5. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS, AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.

6. PROVIDE ALL 90-DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN KITCHEN 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.

7. ALL RTU AND AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.

8. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.

9. 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.

10. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.

11. 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.

12. PROVIDE ACCESS DOORS FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.

13. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

SECTION 0101 - QUALITY OF WORK

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

END OF SECTION 0101

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

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

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

1.2 GROUT
A. NON-SHRINK, FACTORY-PACKAGED.

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

END OF SECTION 230517

SECTION 230518 - ESCUTCHEONS FOR HVAC PIPING

PART 2 - PRODUCTS
2.1 ESCUTCHEONS
A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED AND ROUGH-BRASS FINISH AND SETSCREW FASTENER.
B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
2.2 FLOOR PLATES
A. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.

PART 3 - EXECUTION
3.1 INSTALLATION
A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.
B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.
1. ESCUTCHEONS FOR NEW PIPING:
a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
b. INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE.
c. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
d. BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.

END OF SECTION 230518

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

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

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

END OF SECTION 230529

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

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

1.2 QUALITY ASSURANCE
A. 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.

END OF SECTION 230593

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 START 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 SHOWING THE LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.

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

E. 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 STRICTLY TO THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

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

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

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

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

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

END OF SECTION 230593

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE A 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 INDOORS, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E84.

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 THE BUILDING: R-6
- WITHIN BUILDING ENVELOPE ASSEMBLY: R-12
- OUTSIDE OF BUILDING: R-12

1.4 ITEMS NOT INSULATED:

1. FIBROUS-GLASS DUCTS.
2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/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

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.

1.7 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.

END OF SECTION 230713

PIPING INSULATION

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

PIPING INSULATION SCHEDULE

SERVICE	SIZE (OPERATING TEMP.)	THICKNESS	FINISH
CONDENSATE PIPING (105-140°F)	<1.5"	1.0"	P-6

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION

A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 2-1/2 INCH WG PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THESE STANDARDS, REGARDLESS OF THE VELOCITY IN THE DUCT.

B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 2" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

1. DUCTWORK SHALL BE TRANSVERSELY JOINTED BY CONNECTING SEAMS OF COMPANION ANGLES, FORMED FROM 1-1/2" X 1-1/2" X 1/8" GALVANIZED ANGLES, TACK-WELDED OR RIVETED TO THE DUCT. THE ANGLE FRAME SHALL BE CONTINUOUSLY FLANGED UP INTO THE UPRIGHT OF THE ANGLE AND EACH CORNER SHALL BE FILLED IN AND GROUND SMOOTH. JOINTS SHALL BE GASKETED WITH 1/8" THICK REINFORCED GASKET, OVERLAPPED AT CORNERS, GASKET SIMILAR TO 3M-1202 OR APPROVED EQUAL.

2. RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL-WELDED CONSTRUCTION.

3. HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6' CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.

4. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO THE SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.

5. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.

6. ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC-COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.

7. 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:

ERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

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

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

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

B. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU OF RECTANGULAR DUCTWORK, WITH THE REINFORCEMENT FOR FLAT SIDES THE 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.

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

1.2 MATERIALS

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

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

D. DUCT LINER:

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

E. SEALANT MATERIALS:

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

A. CARNES.
B. HART & COOLEY INC.
C. KRUEGER.
D. METALAIRE, INC.
E. NAILOR INDUSTRIES INC.

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.

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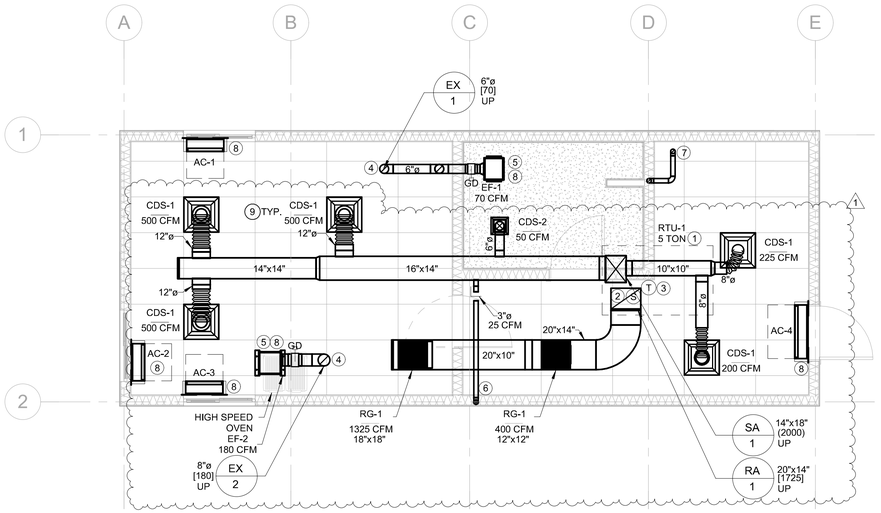
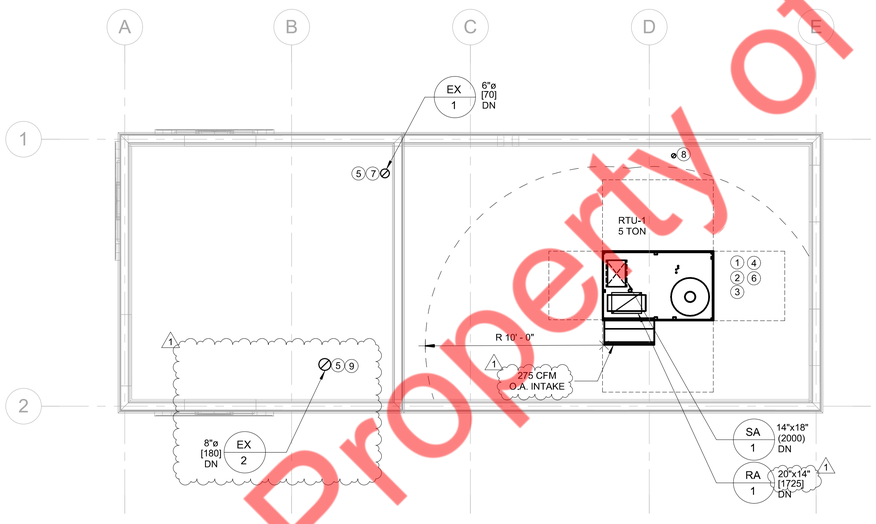
M0.2



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

FLOOR PLAN KEY NOTES:

1. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM RTU-1 TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
2. PROVIDE NEW REMOTE TEMPERATURE/HUMIDITY SENSOR MOUNTED IN RETURN DUCT AND WIRE BACK TO T-STAT.
3. PROVIDE A NEW 7-DAY PROGRAMMABLE THERMOSTAT WITH CONTROL WIRING FROM THE TEMPERATURE SENSOR. MOUNT IT 4' ABOVE THE FLOOR, CONFIRM LOCATION WITH ARCHITECT/OWNER BEFORE ROUGH-IN, AND INCLUDE A LOCKABLE COVER.
4. ROUTE EXHAUST DUCT UP TO THE ROOF. FIELD VERIFY FIRE RATING OF ROOF & PROVIDE FIRE/SMOKE DAMPER AS/IF REQUIRED.
5. PROVIDE FLEXIBLE CONNECTION AT FAN. FAN SHALL BE NTERLOCK WITH TIME CLOCK. POWER BY ELECTRICAL CONTRACTOR (E.C.).
6. 3"ø SA DUCT DN TO CRAWL SPACE. BALANCE FOR 25 CFM. PROVIDE W.M.S.
7. 3"ø RELIEF AIR DUCT FROM CRAWL SPACE TO ROOF. PROVIDE ROOF CAP. PROVIDE W.M.S. AT DUCT END IN CRAWL SPACE.
8. FIELD COORDINATE THE EXACT LOCATION, SIZE AND REQUIRED CONNECTIONS OF HVAC EQUIPMENT. MAINTAIN CODE REQUIRED, MANUFACTURER RECOMMENDED CLEARANCES AT HVAC EQUIPMENT.
9. PROVIDE OPPOSED BLADE VOLUME DAMPERS AT FACE OF ALL CEILING SUPPLY DIFFUSERS, RETURN, AND EXHAUST GRILLES.



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

ROOF PLAN KEY NOTES:

1. EXTEND FULL SIZE SUPPLY AND RETURN DUCTWORK FROM RTU-1 TO SPACE, EXTEND AS SHOWN.
2. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS.
3. ALL EXHAUST AIR SOURCES ON THE ROOF SHALL BE A MINIMUM OF 10 FT. AWAY FROM OUTSIDE AIR INTAKES OF RTU-1.
4. RUN Ø1" PVC CONDENSATE DRAIN FROM RTUS TO NEAREST APPROVED PLACE OF DISPOSAL. DRAIN PIPING SHALL MAINTAIN A MINIMUM SLOPE OF 1% (1/8" PER FOOT) IN THE DIRECTION OF FLOW, PER IMC 307.2.1. CONDENSATE SHALL NOT DISCHARGE INTO A STREET, ALLEY, OR OTHER AREA TO CAUSE A NUISANCE.
5. EXHAUST TERMINATION SHALL BE 3 FEET (914 MM) FROM PROPERTY LINES; 3 FEET (914 MM) FROM OPERABLE OPENINGS INTO BUILDINGS, AND 10 FEET (3048 MM) FROM MECHANICAL AIR INTAKES. AS PER IMC 2021 SECTION 501.3.1.
6. FIELD COORDINATE THE EXACT LOCATION OF ROOFTOP EQUIPMENT. MAINTAIN CODE REQUIRED, MANUFACTURER RECOMMENDED CLEARANCES AT HVAC EQUIPMENT.
7. 6" DIA EXHAUST AIR DUCT THROUGH ROOF HOOD WITH BUILT IN INNER LOUVER. (MANUFACTURER #ACTIVE VENTILATION, MODEL NO:KV-6).
8. 3"Ø RELIEF AIR DUCT THROUGH ROOF HOOD WITH BUILT IN INNER LOUVER. (MANUFACTURER #ACTIVE VENTILATION, MODEL NO:KV-3).
9. 8" DIA EXHAUST AIR DUCT THROUGH ROOF HOOD WITH BUILT IN INNER LOUVER. (MANUFACTURER #ACTIVE VENTILATION, MODEL NO:KV-8). 1

0 3 6 9 12 15 ft

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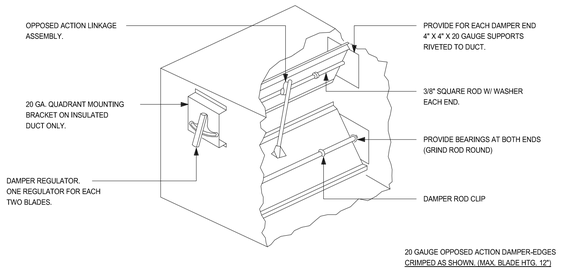
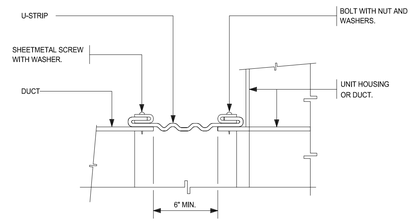
M1.0

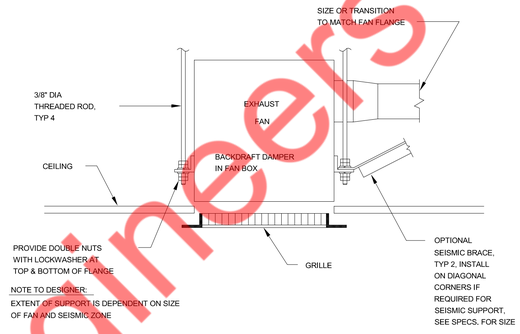


NOTE: 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

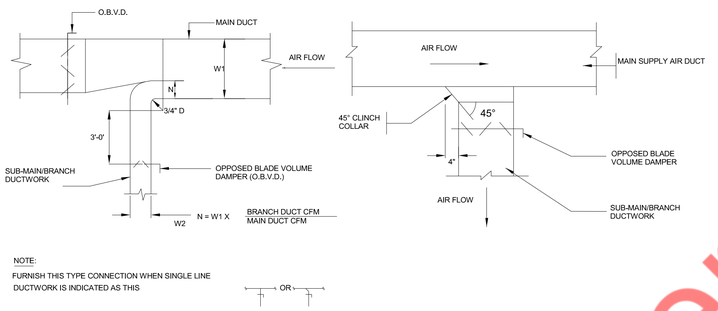
1 M2.0 LOW PRESSURE BALANCING DAMPER
N.T.S



2 M2.0 FLEXIBLE CONNECTION (DUCT-EQUIPMENT)
N.T.S



3 M2.0 CEILING EXHAUST FAN
N.T.S



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

OR

4 M2.0 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
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

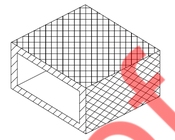


FIG. A

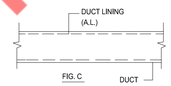


FIG. C

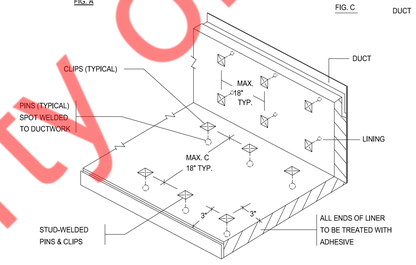
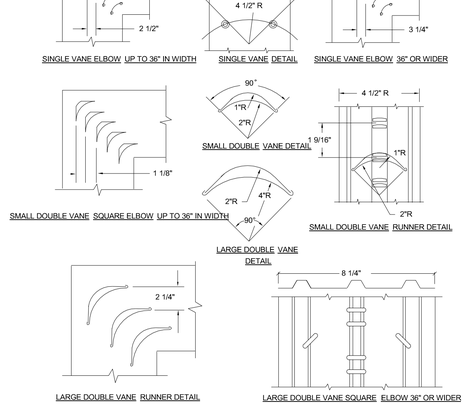


FIG. B

5 M2.0 ACOUSTICAL TREATMENT DUCT LINING
N.T.S



6 M2.0 LOW VELOCITY DUCTWORK ELBOWS
N.T.S

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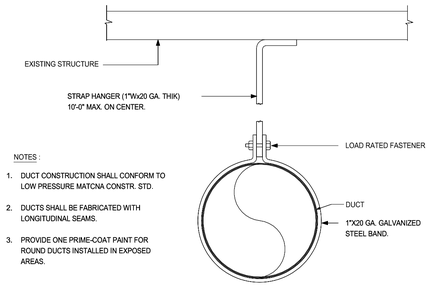
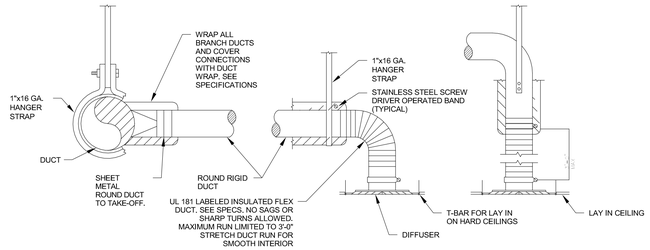
M2.0



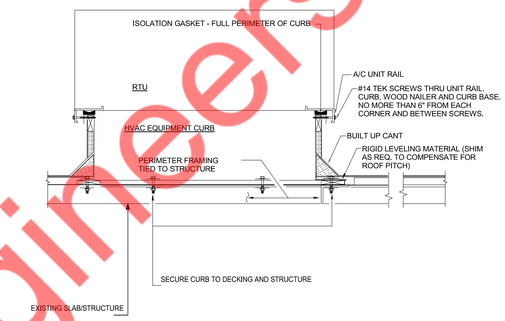
NOTES :

1. DUCT CONSTRUCTION SHALL CONFORM TO LOW PRESSURE MATCNA CONSTR. STD.
2. DUCTS SHALL BE FABRICATED WITH LONGITUDINAL SEAMS.
3. PROVIDE ONE PRIME-COAT PAINT FOR ROUND DUCTS INSTALLED IN EXPOSED AREAS.

1 M2.1 METHOD OF HANGING DUCTWORK N.T.S

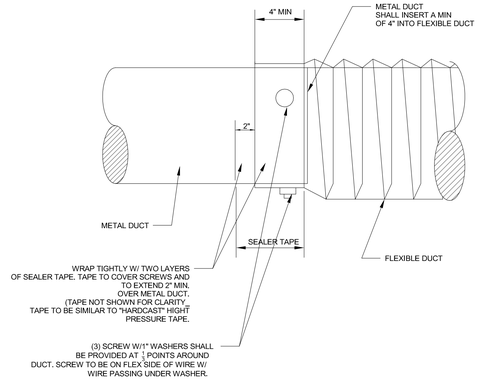


2 M2.1 TYPICAL DIFFUSER CONNECTION DETAIL N.T.S

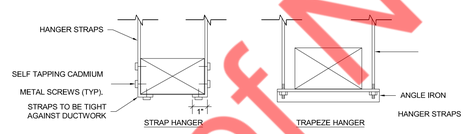


ACCEPTABLE FOR 170 MPH ZONE

3 M2.1 UNIT INSTALLATION ON ROOF N.T.S



4 M2.1 FLEXIBLE DUCT/RIGID DUCT CONNECTION DETAIL N.T.S



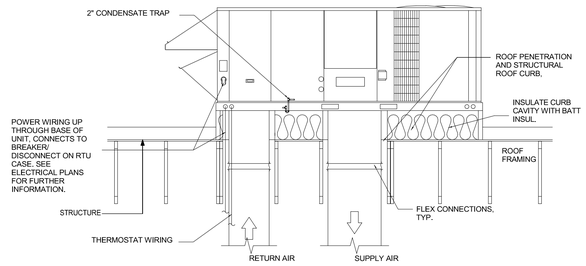
NOTE:
NO POP RIVETS ALLOWED, USE SELF-TAPPING SHEETMETAL SCREWS ONLY.

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

5 M2.1 DUCT HANGING DETAILS N.T.S



6 M2.1 TYPICAL ROOF TOP UNIT DETAIL N.T.S

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M2.1

ELECTRIC ROOF TOP UNIT SCHEDULE

UNIT ID	MANUFACTURER	EFFICIENCY	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			HEATING		COOLING							ELECTRICAL				APPROX.WEIGHT LBS
						TOTAL CFM	OUTSIDE AIR CFM	ESP IN OF WC	TYPE	KW	TOTAL MBH	SENSIBLE MBH	AMBIENT DB (°F)	ENTERING DB / WB(°F)	LEAVING DB / WB(°F)	EER	IEER	VOLTS	PHASE	MCA(A)	MOCP(A)	
RTU-1	CARRIER OR EQUAL	STANDARD	50FEB06A6M5-8A7C0 OR EQUAL	SEE PLAN	5	2000	275	0.8	ELECTRIC	15.8	62	36.6	95	78/63	56/54	11.4	14	208-230	3	67	70	820

NOTES / ACCESSORIES -

1. ALL EQUIPMENT MUST BE HIGH EFFICIENCY, MEETING OR EXCEEDING THE ENERGY CODE 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 GFCI RECEPTACLE.
4. PROVIDE AND INSTALL NEW 14" ROOF CURB. CURB TO BE SHIPPED AS SOON AS POSSIBLE, AHEAD OF THE UNIT.
5. CONDENSATE DRAIN WITH 2" DEEP VENTED TRAP TO DISCHARGE AT APPROVED PLACE OF DISPOSAL.
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 RETURN AIR DUCT & WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.
9. ANTI SHORT CYCLE TIMER.
10. THROWAWAY 2" FILTERS (MERV 8).
11. PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
12. ENTHALPY ECONOMIZER WITH BAROMETER RELIEF, PROVIDE FDD.

FAN SCHEDULE

TAG	MANUFACTURER	MODEL	TYPE	AREA SERVED	FAN PERFORMANCE			MOTOR DATA					WEIGHT LBS	CONTROL
					CFM	ESP	FAN RPM	MCA	MOP	VOLTS	PHASE	HZ		
EF-1	GREENHECK	SP-A110	CEILING MOUNT	RESTROOM	70	0.3	950	0.2	15	115	1	60	20	INTERLOCK WITH TIME CLOCK
EF-2	GREENHECK	SP-A250	CEILING MOUNT	WORK AREA	180	0.5	1000	0.7	15	115	1	60	25	INTERLOCK WITH TIME CLOCK

NOTES

1. ALL FANS TO BE LABELED PER PROJECT IDENTIFICATION STANDARDS.
2. PROVIDE MOTOR STARTERS AND DISCONNECTS WITH NEMA-1 ENCLOSURES FOR EF-1& EF-2, IF NOT FACTORY-PROVIDED. COORDINATE EXACT POWER REQUIREMENT WITH ELECTRICAL CONTRACTOR.
3. ALL NORMAL POWER WIRING TO BE PROVIDED BY ELECTRICAL CONTRACTOR. COORDINATE EXACT POWER REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
4. PROVIDE FAN WITH A BACKDRAFT DAMPER AND SPEED CONTROLLER FOR BALANCING PURPOSES.
5. ALL DIRECT-DRIVE FANS SHALL BE PROVIDED WITH ECM MOTORS.
6. PROVIDE FIRE BLANKET AND RADIATION DAMPER AS /IF REQUIRED FOR FIRE RATED CEILING.

VENTILATION CALCULATION AS PER IMC 2021 - TABLE 403.3.1.1

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000 SQ.FT. AS PER IMC 2021	NUMBER OF PEOPLE AS PER IMC 2021	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2021		REQ. OA (CFM)	EFFECTIVENESS 80%	PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR /EIXT.)	TOTAL EXHAUST (CFM)	PROVIDED EXHAUST (CFM)
					CFM/PEOPLE	CFM/SQ.FT						
WORK AREA	255	20	6	3	7.5	0.12	53	66	275	0.7	179	180
STORAGE	190	0	0	1	0	0.12	23	29		-	-	0
RESTROOM	69	0	0	0	0	0	0	0		70	70	70
TOTAL	514	-	-	-	-	-	75	95	275	-	TOTAL	250

BUILDING AIR BALANCE

UNIT	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1	2000 CFM	275 CFM	1725 CFM	-
EF-1	-	-	-	70 CFM
EF-2	-	-	-	180 CFM
TOTAL:	2000 CFM	275 CFM	1725 CFM	250 CFM
BUILDING PRESSURE:			25 CFM	POSITIVE

CRAWL SPACE VENTILATION CALCULATION:

1 CFM / 50 SQ.FT. AS PER IBC 1202.4.3.1
CRAWL SPACE AREA - 543 SQ.FT.
TOTAL VENTILATION CFM REQUIRED = (1*543) / 50 = 11 CFM
ACTUAL VENTILATION CFM SUPPLY = 25 CFM

NOTE:
1. ABOVE CALCULATION DONE BASED ON IBC SECTION - 1202.4.3.1.
2. CRAWL SPACE GROUND SURFACE SHALL BE COVERED WITH A CLASS I VAPOR RETARDER, LAPPED AND SEALED PER CODE REQUIREMENTS.
3. SEE ARCHITECTURAL FOR VAPOR BARRIER AND FOUNDATION ENCLOSURE DETAILS.

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	LPV225-1UA-OB	25"	8	20	UNHEATED	625	1800	1/6	115/1/60	2.4	49
	AC-2	LPV225-1UA-OB	25"	8	20		625	1800	1/6	115/1/60	2.4	49
	AC-3	LPV225-1UA-OB	25"	8	20		625	1800	1/6	115/1/60	2.4	49
	AC-4	LPV236-1UA-OB	36"	8	32		900	1800	1/6	115/1/60	2.4	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.

AIR TERMINAL SCHEDULE

TAG	MANUFACTURER	MODEL	TYPE	CFM RANGE	NECK SIZE	NOMINAL FACE SIZE
CDS-1	TITUS	TMSA	SUPPLY DIFFUSER	150-350	8"⌀	24"X24"
			SUPPLY DIFFUSER	350-500	12"⌀	
CDS-2			SUPPLY DIFFUSER	0-150	6"⌀	12"X12"
RG-1		350FL	RETURN GRILLE	SEE PLANS	SEE PLANS	24"X24"

NOTES:

1. ALL DIFFUSERS : CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS PLANS TO ENSURE PROPER AIR DEVICE BORDER SELECTION.
2. REFER ARCHITECTURAL DRAWINGS FOR CEILING TYPE.
3. COORDINATE COLOR/FINISH WITH ARCHITECT.
4. PROVIDE VOLUME CONTROL DAMPER/OPPOSED BLADE DAMPER AS ACCESSORY FOR ALL AIR TERMINAL FOR AIR BALANCING.

System Checksums

By Trial

RTU-1 — Single Zone

COOLING COIL PEAK — Peaked at Time: Mo/Hr: 7 / 15; Outside Air: OADB/WB/HR: 93 / 70 / 82

	Space Sens. + Lat. Btu/h	Plenum Sens. + Lat Btu/h	Net Total Btu/h	Percent Of Total (%)
Envelope Loads				
Skylite Solar	0	0	0	0
Skylite Cond	0	0	0	0
Roof Cond	0	1,030	1,039	2
Glass Solar	1,509	0	1,509	3
Glass/Door Cond	733	0	733	2
Wall Cond	1,938	424	2,362	5
Partition/Door	0		0	0
Floor	0		0	0
Adjacent Floor	0	0	0	0
Infiltration	782		782	2
Sub Total ==>	4,962	1,454	6,416	13
Internal Loads				
Lights	1,684	421	2,105	4
People	2,750	0	2,750	6
Misc	28,082	0	28,082	58
Sub Total ==>	32,516	421	32,937	68
Ceiling Load	132	-132	0	0
Ventilation Load	0	0	9,310	19
Adj Air Trans Heat	0		0	0
Dehumid. Ov Sizing			0	0
Ov/Undr Sizing	0		0	0
Exhaust Heat		-261	-261	-1
Sup. Fan Heat			0	0
Ret. Fan Heat		0	0	0
Duct Heat Pkup		0	0	0
Underflr Sup Ht Pkup			0	0
Supply Air Leakage		0	0	0
Grand Total ==>	37,611	1,482	48,402	100.00

CLG SPACE PEAK — Mo/Hr: Sum of; OADB: Peaks

	Space Sensible Btu/h	Percent Of Total (%)
Envelope Loads		
Skylite Solar	0	0
Skylite Cond	0	0
Roof Cond	0	0
Glass Solar	2,305	6
Glass/Door Cond	566	2
Wall Cond	2,493	7
Partition/Door	0	0
Floor	0	0
Adjacent Floor	0	0
Infiltration	362	1
Sub Total ==>	5,726	15
Internal Loads		
Lights	1,684	5
People	1,375	4
Misc	28,082	76
Sub Total ==>	31,141	84
Ceiling Load	141	0
Ventilation Load	0	0
Adj Air Trans Heat	0	0
Ov/Undr Sizing	0	0
Exhaust Heat		
OA Preheat Diff.		
RA Preheat Diff.		
Additional Reheat		
Underflr Sup Ht Pkup		
Supply Air Leakage		
Grand Total ==>	37,008	100.00

HEATING COIL PEAK — Mo/Hr: Heating Design; OADB: -18

	Space Peak Space Sens Btu/h	Coil Peak Tot Sens Btu/h	Percent Of Total (%)
Envelope Loads			
Skylite Solar	0	0	0.00
Skylite Cond	0	0	0.00
Roof Cond	0	-1,379	3.27
Glass Solar	0	0	0.00
Glass/Door Cond	-3,945	-3,945	9.34
Wall Cond	-3,999	-4,888	11.58
Partition/Door	0	0	0.00
Floor	-4,778	-4,778	11.32
Adjacent Floor	0	0	0
Infiltration	-2,353	-2,353	5.57
Sub Total ==>	-15,074	-17,342	41.08
Internal Loads			
Lights	0	0	0.00
People	0	0	0.00
Misc	0	0	0.00
Sub Total ==>	0	0	0.00
Ceiling Load	-157	0	0.00
Ventilation Load	0	-25,173	59.63
Adj Air Trans Heat	0	0	0
Ov/Undr Sizing	0	0	0.00
Exhaust Heat		300	-0.71
OA Preheat Diff.		0	0.00
RA Preheat Diff.		0	0.00
Additional Reheat		0	0.00
Underflr Sup Ht Pkup		0	0.00
Supply Air Leakage		0	0.00
Grand Total ==>	-15,231	-42,216	100.00

TEMPERATURES

	Cooling	Heating
SADB	55.4	77.0
Ra Plenum	75.8	69.0
Return	75.8	69.0
Ret/OA	78.1	57.5
Fn Mtr/TD	0.0	0.0
Fn Btd/TD	0.0	0.0
Fn Frict	0.0	0.0

AIRFLOWS

	Cooling	Heating
Diffuser	2,071	2,071
Terminal	2,071	2,071
Main Fan	2,071	2,071
Sec Fan	0	0
Nom Vent	275	275
AHU Vent	275	275
Infil	26	26
MinStop/Rh	0	0
Return	2,093	2,093
Exhaust	297	297
Rm Exh	3	3
Auxiliary	0	0
Leakage Dwn	0	0
Leakage Ups	0	0

ENGINEERING CKS

	Cooling	Heating
% OA	13.3	13.3
cfm/ft²	4.03	4.03
cfm/ton	446.46	
ft²/ton	110.81	
Btu/hr·ft²	108.29	-86.24
No. People	5	

COOLING COIL SELECTION

	Total Capacity ton	Total Capacity MBh	Sens Cap. MBh	Coil Airflow cfm	Enter DB °F	Enter WB °F	Enter gr/lb	Leave DB °F	Leave WB °F	Leave gr/lb
Main Clg	4.6	55.7	49.0	2,071	78.1	61.6	60.8	55.4	52.0	56.1
Aux Clg	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Opt Vent	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Total	4.6	55.7								

AREAS

	Gross Total ft²	Glass ft²	Glass (%)
Floor	514		
Part	0		
Int Door	0		
Ex/Flr	103		
Roof	514	0	0
Wall	1,192	72	6
Ext Door	41	0	0

HEATING COIL SELECTION

	Capacity MBh	Coil Airflow cfm	Ent °F	Lvg °F
Main Htg	-44.3	2,071	57.5	77.0
Aux Htg	0.0	0	0.0	0.0
Preheat	0.0	0	0.0	0.0
Humidif	0.0	0	0.0	0.0
Opt Vent	0.0	0	0.0	0.0
Total	-44.3			

Project Name: Bismarck, ND
Dataset Name: BISMARCK_ND.TRC

TRACE® 700 v6.3.3 calculated at 04:46 PM on 12/19/2025
Alternative - 1 System Checksums Report Page 1 of 1

NOTE:
1. U-VALUES AS PER THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC), 2021.
2. SINCE THIS IS A MODULAR BUILDING, THE LARGEST GLAZING SIDE IS CONSIDERED AS WEST FOR MAXIMUM LOAD CALCULATION.

#	DATE	REVISION
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS

DAILY PERKS

DATE: 09-10-2025
CONTENTS: MECHANICAL SCHEDULES

M3.0

COMcheck Software Version COMcheckWeb

Mechanical Compliance Certificate

Project Information

Energy Code: 2021 IECC
Project Title: DAILY PERKS BISMARCK, ND
Location: Bismarck, North Dakota
Climate Zone: 6a
Project Type: New Construction

Construction Site:
DAILY PERKS-COFFEE SHOP
BISMARCK, ND
BISMARCK, North Dakota

Owner/Agent:

Designer/Contractor:
ERIC ENGELL
EMR ENGINEERS
4236 HWY 3630
ANNVILLE, Kentucky 40402

Additional Efficiency Package(s)

Credits: 10.0 Required 0.0 Proposed

Mechanical Systems List

Quantity System Type & Description

1 RTU-1 (Single Zone w/ PerimeterSystem):
Heating: 1 each - Unit Heater, Electric, Capacity = 55 kBtu/h
No minimum efficiency requirement applies
Cooling: 1 each - Single Package DX Unit, Capacity = 62 kBtu/h, Air-Cooled Condenser, Air Economizer
Proposed Efficiency = 14.00 SEER2, Required Efficiency = 13.40 SEER2
Proposed Part Load Efficiency = 0.00 , Required Part Load Efficiency = 0.00

1 Water Heater:
Electric Storage Water Heater, Capacity: 50 gallons w/ Circulation Pump
No minimum efficiency requirement applies

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 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

ERIC ENGELL — Name - Title
06/30/25 — Date

COMcheck Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2021 IECC

Requirements: 100.0% 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.

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR2]¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical and service water heating systems and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C406 [PR9]¹	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

Section # & Req.ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5, C404.5.1, C404.5.2 [PL6]¹	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.1, C404.6.2 [PL3]¹	Automatic time switches installed to automatically switch off the recirculating hot-water system or heat trace.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.3 [PL7]¹	Pumps that circulate water between a heater and storage tank have controls that limit operation from startup to <= 5 minutes after end of heating cycle.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.6.1, C404.6.1.1 [PL8]¹	Demand recirculation water systems have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance and limits the temperature of the water entering the cold-water piping to 104°F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.6 [ME141]²	HVAC systems serving guestrooms in Group R-1 buildings with > 50 guestrooms: Each guestroom is provided with controls that automatically manage temperature setpoint and ventilation (see sections C403.7.6.1 and C403.7.6.2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.4 [ME57]²	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.7.5 [ME116]²	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood rating requirements and maximum exhaust rate criteria.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C403.12.1 C403.12.2 [ME60]²	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during foundation inspection.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5, C403.5.1, C403.5.2 [ME62]²	Air economizers provided where required, meet the requirements for design capacity, control signal, ventilation controls, high-limit shut-off, integrated economizer control, and provide a means to relieve excess outside air during operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.2 [ME16]²	Economizer operation will not increase heating energy use during normal operation.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3, 3 [ME124]²	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3.3 for applicable device types and climate zones.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3, 4 [ME125]²	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.5.3, 5 [ME126]²	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1, 4 [ME63]²	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures > 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Section # & Req.ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.3.3 [ME35]²	Hot gas bypass limited to: <=240 kBtu/h - 50% >240 kBtu/h - 25%	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C408.2.2.1 [ME53]²	Air outlets and zone terminal devices have means for air balancing.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.11.3, 1, C403.11.3.2 [ME123]²	Refrigerated display cases, walk-in coolers or walk-in freezers served by remote compressors and remote condensers not located in a condensing unit, have fan-powered condensers that comply with Sections C403.11.3.1 and refrigeration compressor systems that comply with C403.11.3.2.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.

Additional Comments/Assumptions:

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

Additional Comments/Assumptions:

Section # & Req.ID	Final Inspection	Complies?	Comments/Assumptions
C303.3, C408.2.5.3 [FI8]¹	Furnished O&M manuals for HVAC systems within 90 days of system acceptance.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.1.1 [FI50]¹	HVAC systems and equipment design loads calculated in accordance with ANSI/ASHRAE/ACCA Standard 183 or by an approved equivalent computational procedure	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.3.1 [FI27]¹	HVAC systems and equipment capacity does not exceed calculated loads.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1 [FI47]¹	Heating and cooling to each zone is controlled by a thermostat control. Minimum one humidity control device per installed humidification/dehumidification system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1.2 [FI38]¹	Thermostatic controls have a 5 °F deadband.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.1.3 [FI20]¹	Temperature controls have setpoint overlap restrictions.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.2 [FI39]¹	Each zone equipped with setback controls using automatic time clock or programmable control system.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C403.4.2.1, C403.4.2.2 [FI40]¹	Automatic Controls: Setback to 55°F (heat) and 85°F (cool); 7-day clock, 2-hour occupant override, 10-hour backup	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.3 [FI11]¹	Heat traps installed on supply and discharge piping of non-circulating systems.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	**Exception:** Requirement does not apply.
C404.4 [FI25]¹	All piping insulated in accordance with section details and Table C403.12.3.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C404.6.1 [FI12]¹	Controls are installed that limit the operation of a recirculation pump installed to maintain temperature of a storage tank. System return pipe is a dedicated return pipe or a cold water supply pipe.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

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

Additional Comments/Assumptions:

DAILY PERKS

#	DATE	REVISION
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS

DATE: 09-10-2025
CONTENTS: ENERGY COMPLIANCE

M4.0

PLUMBING LEGEND

SYMBOL	DESCRIPTION
	SANITARY PIPING (SAN)
SAN	SANITARY UNDER GROUND (SAN)
	VENT PIPING (V)
	COLD WATER PIPING (CW)
	HOT WATER PIPING (HW)
	HOT WATER RETURN PIPING (HWR)
	GREASE WASTE (GW)
GW	GREASE WASTE UNDER GROUND (GW)
G	GAS PIPING (G)
	FILTER WATER LINE (FW)
	P-TRAP
	PIPE UP
	PIPE DROP
	PLUGGED OUTLET/CLEANOUT
	SHUT-OFF VALVE
	CHECK VALVE
	SLEEVE
	GAS PLUG VALVE
	CHECK VALVE
	VACUUM BREAKER
	WATER HAMMER ARRESTOR
	AIR RELEASE VALVE
	SHOCK ABSORBER
	BALANCING VALVE
	PRESSURE RELIEF VALVE
	POINT OF NEW CONNECTION
	POINT OF DISCONNECTION
	FLOOR CLEAN OUT (FCO)
	HALF- GRATE FLOOR SINK (FS)
	FULL- GRATE FLOOR SINK (FS)
	PIPE DOWN
	PIPE UP

PLUMBING ABBREVIATIONS

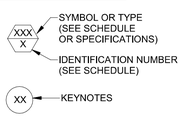
AC	ACCESS DOOR
AD	AREA DRAIN
AAV	AIR ADMITTANCE VALVE
ABV	ABOVE
AFF	ABOVE FINISHED FLOOR
A/E	ARCHITECT/ENGINEER
AHJ	AUTHORITY HAVING JURISDICTION
ADA	AMERICANS WITH DISABILITIES ACT
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
BHP	BRAKE HORSEPOWER
BT	BATH TUB
BTU	BRITISH THERMAL UNIT
BFP	BACK FLOW PREVENTER
C/I	CONTRACTOR INSTALLED
CD	CONDENSATE DRAIN
CO	CLEAN OUT
CONN	CONNECTION
CONT	CONTINUOUS
CP	CIRCULATION PUMP
CV	CHECK VALVE
CW	COLD WATER
DF	DRINKING FOUNTAIN
DFU	DRAINAGE FIXTURE UNIT
DIA	DIAMETER
DN	DOWN
DW	DISH WASHER
DWG	DRAWING
ECO	EXTERIOR CLEAN OUT
(E)	EXISTING
ET	EXPANSION TANK
EWC	ELECTRIC WATER COOLER
°F	DEGREE FAHRENHEIT
FCO	FLOOR CLEAN OUT
FD	FLOOR DRAIN
FFL	FINISH FLOOR LEVEL
FS	FLOOR SINK
FFD	FLOOR FUNNEL DRAIN
GAL	GALLONS
GD	GARBAGE DISPOSER
GPM	GALLONS PER MINUTE
GPR	GAS PRESSURE REGULATOR
GW	GREASE WASTE
GWH	GAS WATER HEATER
GI	GREASE INTERCEPTOR
HW	HOT WATER
HWC	HOT WATER CIRCULATION
HB	HOSE BIB
I.E.	INVERT ELEVATION
IWH	INSTANTANEOUS WATER HEATER
KS	KITCHEN SINK
L	LAVATORY
M	METER
MB	MOP SINK
MX	MIXING VALVE
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
N.T.S.	NOT TO SCALE
OW	OIL WASTE
PD	PUMP DISCHARGE
PDI	PLUMBING DRAINAGE INSTITUTE
PSIG	POUNDS PER SQUARE INCH GAUGE
RD	ROOF DRAIN
OD	OVERFLOW ROOF DRAIN
RC	ROOF CONDUCTOR
RM	ROOM
S	SINK
SAN	SANITARY
SH	SHOWER
TD	TRENCH DRAIN
TPV	TEMPERATURE/PRESSURE RELIEF VALVE
TP	TRAP PRIMER
TYP	TYPICAL
TW	TEMPERED WATER
UB	UTILITY BOX
U/G	UNDERGROUND
UR	URINAL
V	VENT
VTR	VENT THROUGH ROOF
W	WASTE
WC	WATER CLOSET
WCO	WALL CLEAN OUT
WH	WATER HEATER
WHA	WATER HAMMER ARRESTOR
WM	WASHING MACHINE

PLUMBING SHEET INDEX

APPLICABLE CODES

- 2021 INTERNATIONAL BUILDING CODE (IBC)
- 2018 UNIFORM PLUMBING CODE (UPC)
- 2021 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
- 2021 INTERNATIONAL MECHANICAL CODE (IMC)
- 2023 NATIONAL ELECTRICAL CODE (NEC)

EQUIPMENT IDENTIFICATION



PLUMBING GENERAL NOTES

1. PLUMBING GENERAL NOTES ON THESE DRAWINGS ARE A PART OF THE PLUMBING SPECIFICATIONS TO THE SAME EXTENT AS IF WRITTEN HEREIN FULL.
2. ALL WORK AND MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF LOCAL AND STATE GOVERNING CODES, ORDINANCES AND HEALTH DEPARTMENT REGULATIONS. 1
3. ALL PIPING SHALL BE SUPPORTED FROM STRUCTURAL MEMBERS OF THE BUILDING, OR AS APPROVED BY THE ARCHITECT OR OWNER'S REPRESENTATIVE. PLACE ALL HANGERS ACCORDANCE WITH NDSPC TABLE 313.3.

   - 1 INCH AND SMALLER, 32 INCHES;
   - 1-1/4 INCHES AND LARGER, 4 FEET

4. VALVES,UNIONS, ETC. TO BE SAME SIZE AS PIPE UNLESS OTHER WISE INDICATED ON DRAWINGS.
5. IN CONCEALED LOCATIONS WHERE PIPING, OTHER THAN CAST IRON OR GALVANIZED STEEL, IS INSTALLED THROUGH HOLES OR NOTCHES IN STUDS, JOISTS, RAFTERS OR SIMILAR MEMBERS LESS THAN 1 1/4 INCHES FROM THE NEAREST EDGE OF THE MEMBER, THE PIPE SHALL BE PROTECTED BY STEEL SHIELD PLATES. SUCH PLATES SHALL COVER THE AREA OF THE PIPE WHERE THE MEMBER IS NOTCHED OR BORED, AND SHALL EXTEND NOT LESS THAN 2 INCHES ABOVE SOLE PLATES AND BELOW TOP PLATES.
6. SHIELD PLATES SHALL BE OF STEEL MATERIAL HAVING A THICKNESS OF NOT LESS THAN 0.0575 INCH.

PLUMBING SPECIFICATIONS

DEFINITIONS:

1. WATER DISTRIBUTION PIPING: INTERIOR DOMESTIC WATER PIPING.
2. WATER SERVICE: EXTERIOR DOMESTIC WATER PIPING.
3. ACCESSIBLE FIXTURE: PLUMBING FIXTURE THAT CAN BE APPROACHED, ENTERED, AND USED BY PEOPLE WITH DISABILITIES.

PERFORMANCE REQUIREMENTS:

1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND COMPONENTS.
2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT, CONNECTED SYSTEMS AND COMPONENTS.
3. DESIGN SEISMIC-RESTRAINT (IF APPLICABLE) HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT, AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
4. COMPONENTS AND INSTALLATION SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING WORKING PRESSURE, UNLESS OTHERWISE INDICATED:

   4.1. DOMESTIC WATER PIPING: 125 PSIG.
   4.2. SANITARY WASTE AND VENT PIPING: 10' HEAD OF WATER.
   4.3. STORM DRAINAGE PIPING: 10' HEAD OF WATER.
   4.4. FORCE-MAIN: 100 PSIG.
   4.5. GAS PIPING: 60 PSIG.

PLUMBING FIXTURES:

1. PLUMBING FIXTURES AND TRIMMINGS HAVE BEEN SELECTED AS A BASE FOR THIS INSTALLATION, EXCEPT WHERE OTHERWISE SPECIFIED, BUT OTHER MAKES WHICH ARE EQUAL AND APPROVED MAY BE USED.
2. INSTALL/PROVIDE FLUSH VALVES AND/OR FLUSH TANKS WITH HANDLE ON OPEN SIDE OF FIXTURE.
3. CAULK ALL FIXTURES WATER TIGHT TO WALL AND FLOOR USING CLEAR SILICONE CAULK NEAT AND SMOOTHLY SET IN PLACE AND EXCESS CLEANED FROM WALL OR FIXTURE.
4. THERMOSTATIC MIXING VALVES, SHALL BE INSTALLED ON ALL SINKS AND LAVATORIES WITHOUT EXCEPTION.

HANGERS AND SUPPORTS:

1. STEEL PIPE HANGERS AND SUPPORTS: MSS SP-58, TYPES 1 THROUGH 58, FACTORY-FABRICATED COMPONENTS. REFER TO EXECUTION SECTION "HANGER AND SUPPORT APPLICATIONS."

   1.1. GALVANIZED, METALLIC COATINGS: PRE-GALVANIZED OR HOT DIPPED.
   1.2. NON-METALLIC COATINGS: PLASTIC COATING, JACKET, OR LINER.
   1.3. PADDED HANGERS: HANGER WITH FIBERGLASS OR OTHER PIPE INSULATION PAD OR CUSHION FOR SUPPORT OF BEARING SURFACE OF PIPING.

2. COPPER PIPING SHALL BE SUPPORTED AT INTERVALS NOT TO EXCEED 6'-0" AND AT EACH CHANGE IN HORIZONTALS OF VERTICAL. HANGERS SHALL SUPPORT PIPING AT PIPE WITH INSULATION OVER TOP OR WITH METAL SLEEVE TO PROTECT INSULATION FROM BEING CRUSHED.

   2.1. HANGER SHIELD: HANGERS FOR PIPING SHALL BE PLACED AROUND THE OUTSIDE OF THE INSULATION AND PROTECTIVE SHIELDS SHALL BE INSTALLED AT EVERY HANGER LOCATION. SHIELD SHALL NOT BE LESS THAN 2/3 THE CIRCUMFERENCE OF THE INSULATION AND WHERE SPEED CLIPS ARE USED, THE METAL SHIELD SHALL BE CONTINUOUS AROUND THE CIRCUMFERENCE OF THE PIPE INSULATION. SHIELDS SHALL BE FABRICATED OF THE FOLLOWING GAUGES:

NOMINAL PIPE SIZE	METAL GAUGE
0" - 1 1/2"	20
2" - 3"	16
3 1/2"	UP TO 14

3. TRAPEZE PIPE HANGERS: MSS SP-69, TYPE 69, SHOP OR FIELD FABRICATED PIPE-SUPPORT ASSEMBLY MADE FROM STRUCTURAL STEEL SHAPES WITH MSS-SP-58 HANGER RODS, NUTS, SADDLES, AND U-BOLTS.
4. METAL FRAMING SYSTEMS: MFMA-3, SHOP OR FIELD FABRICATED PIPE SUPPORT ASSEMBLY MADE OF STEEL CHANNELS AND OTHER COMPONENTS.
5. THERMAL HANGER SHIELD INSERTS: 100-PSIG MINIMUM, COMPRESSIVE STRENGTH INSULATION INSERT ENCASED IN SHEET METAL SHIELD.
6. FASTENER SYSTEMS:

   6.1. POWDER ACTUATED FASTENERS: THREADED STEEL STUD, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH PULLOUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.

   6.2. MECHANICAL EXPANSION ANCHORS: INSERT WEDGE TYPE, ZINC COATED OR STAINLESS STEEL, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH PULLOUT, TENSION, AND SHEAR CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS WHERE USED.

7. EQUIPMENT SUPPORTS: WELDED, SHOP OR FIELD FABRICATED EQUIPMENT SUPPORT MADE FROM STRUCTURAL STEEL SHAPES.
8. MISCELLANEOUS MATERIALS:

   8.1. STRUCTURAL STEEL: ASTM A 46/A 36M, STEEL PLATES, AND BARS; BLACK AND GALVANIZED.
   8.2. GROUT: ASTM C 1107, FACTORY-MIXED AND PACKAGED, DRY, HYDRAULIC-CEMENT, NON-SHRINK AND NON-METALLIC GROUT; SUITABLE FOR INTERIOR AND EXTERIOR APPLICATIONS.
   8.3. PROPERTIES: NON-STAINING, NON-CORROSIVE, AND NON-GASEOUS.
   8.4. DESIGN MIX: 5000-PSI, 28-DAY COMPRESSIVE STRENGTH.

9. PROVIDE SEISMIC BRACING OF PIPING BASED ON SEISMIC CATEGORY OF ZONE PROJECT IS BEING \ CONSTRUCTED.

INSULATION:

1. THERMAL INSULATION MATERIALS SHALL MEET THE PROPERTY REQUIREMENTS OF THE FOLLOWING,

   1.1. ASTM C547, ASTM C585, AND ASTM C1136.

2. INSULATION MATERIALS SHALL MEET THE MINIMUM REQUIREMENTS OF IECC-2021.
3. INSULATION MATERIALS SHALL HAVE A MAXIMUM FLAME SPREAD INDEX OF 25 AND A MAXIMUM SMOKE DEVELOPED INDEX OF 50 WHEN TESTED IN ACCORDANCE WITH THE FOLLOWING TESTING STANDARDS:

   3.1. ASTM E84, UL 723 AND NFPA 255.

4. INSULATION SHALL BE FIBERGLASS PRE-FORMED PIPE INSULATION, ONE-PIECE, HINGED SECTION, WITH FACTORY APPLIED WHITE POLYMER FACING, TWO-COMPONENT ADHESIVE CLOSURE SYSTEM, AND MATCHING PRESSURE SENSITIVE TAPE. MANUFACTURER'S DATA REGARDING THICKNESS CONSTRAINTS IN RELATION TO OPERATING TEMPERATURE SHALL BE FOLLOWED. STAPLING IS NOT ALLOWED TO COMPLETE THE CLOSURE.
5. INSULATION MATERIAL CAN BE A FLEXIBLE ELASTOMERIC POLYETHYLENE INSULATION. INSTALL IN CONFORMATION WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. COVER ALL OF THE FOLLOWING PIPE TYPES LISTED WITH PRE MOLDED PIPE INSULATION OF THICKNESS INDICATED, 4 LB. DENSITY AND ASJ JACKET.

PIPE TYPE	INSULATION THICKNESS (INCHES)
DOMESTIC COLD WATER	
PIPE SMALLER THAN 1-1/2 INCH	1/2
PIPE 1-1/2" INCH AND LARGER	1
DOMESTIC HOT WATER	
PIPE SMALLER THAN 1-1/2 INCH	1
PIPE 1-1/2" AND LARGER	1-1/2
DOMESTIC HOT WATER (CIRCULATING)	
PIPE SMALLER THAN 1-1/2 INCH	1
PIPE 1-1/2" AND LARGER	1-1/2
STORM WATER	
PIPE 3 INCH AND LARGER	1

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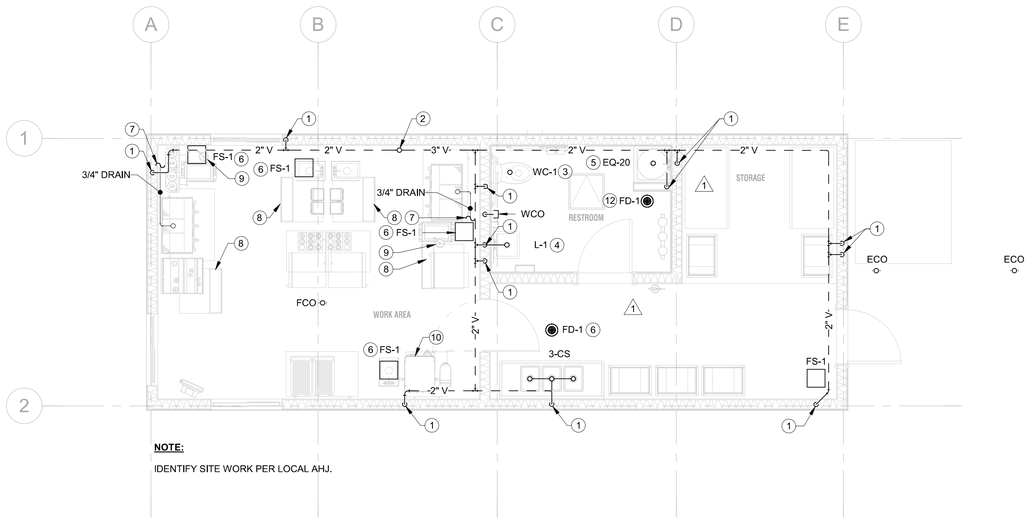
CONTENTS: PLUMBING LEGENDS, ABBREVIATIONS, NOTES AND SPECIFICATIONS

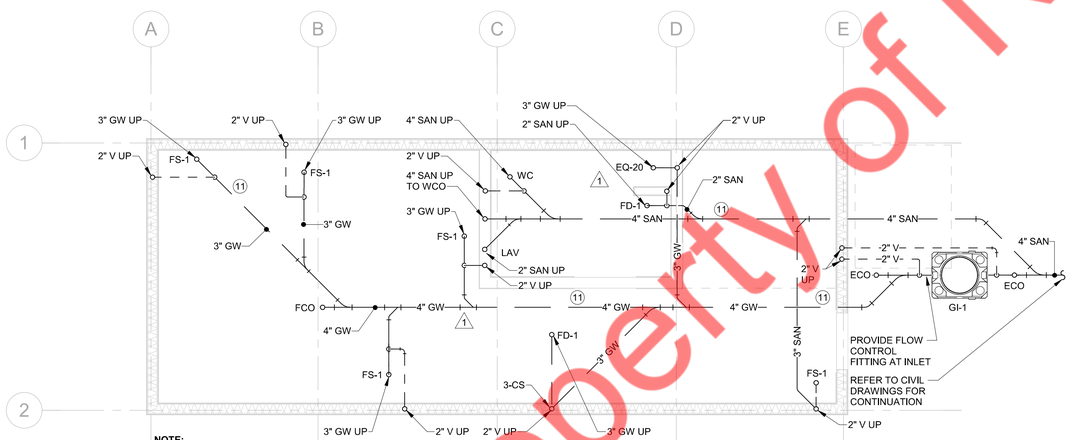
P0.1



NOTE:

IDENTIFY SITE WORK PER LOCAL AHJ.

1 SANITARY DRAINAGE AND VENT FLOOR PLAN
1/4" = 1'-0"



NOTE:

IDENTIFY SITE WORK PER LOCAL AHJ.

ALL SEWER LINES TO BE MADE UP IN FIELD AFTER BUILDING IS PLACED AND COORDINATED WITH CIVIL ENGINEER UTILITY PLAN.

GREASE TO BE SIZED BY LOCAL REGISTRANT TO MEET LOCAL CODES AND ORDINANCES
ALL GREASE PIPING SHOWN FOR REFERENCE ONLY AND TO BE VERIFIED BY LOCAL DESIGN TEAM.

2 SANITARY DRAINAGE AND VENT UNDERFLOOR PLAN
1/4" = 1'-0"

0 3 6 9 12 15 ft

SANITARY DRAINAGE AND VENT FLOOR PLAN KEYNOTES:

1. 2"Ø V PIPE DN.
2. 3"Ø VENT UP & 3"Ø VTR.
3. 4"Ø SAN PIPE UP TO WC-1.
4. 2"Ø SAN PIPE UP TO L-1.
5. 3"Ø SAN PIPE UP TO EQ-20.
6. 3"Ø GW PIPE UP TO FD-1.
7. TERMINATE THE DRAIN PIPE FOR ESPRESSO MACHINE INDIRECTLY TO THE NEAREST FLOOR SINK. THE CONTRACTOR IS REQUIRED TO VERIFY THE ROUTING AND TERMINATION IN THE FIELD.
8. TERMINATE THE DRAIN PIPE FOR ICE MACHINE INDIRECTLY TO THE NEAREST FLOOR SINK. THE CONTRACTOR IS REQUIRED TO VERIFY THE ROUTING AND TERMINATION IN THE FIELD.
9. TERMINATE THE DRAIN PIPE FOR DIPPER WELL INDIRECTLY TO THE NEAREST FLOOR SINK. THE CONTRACTOR IS REQUIRED TO VERIFY THE ROUTING AND TERMINATION IN THE FIELD.
10. TERMINATE THE DRAIN PIPE FOR COFFEE BREWER INDIRECTLY TO THE NEAREST FLOOR SINK. THE CONTRACTOR IS REQUIRED TO VERIFY THE ROUTING AND TERMINATION IN THE FIELD.
11. PROVIDE HEAT TRACING FOR ALL EXPOSED SANITARY PIPING IF REQUIRED.
12. T&P DRAIN / INDIRECT DRAIN FROM WATER HEATER AND FILTER MACHINE DISCHARGE INTO FD-1.

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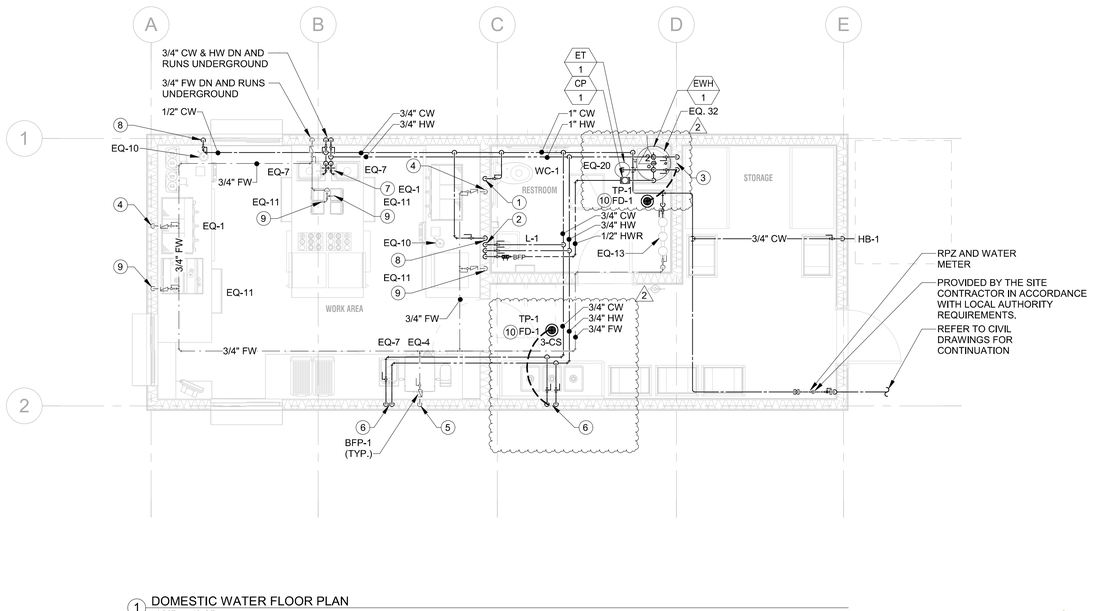
CONTENTS: SANITARY DRAINAGE AND VENT FLOOR PLAN

P1.0



1 DOMESTIC WATER FLOOR PLAN
1/4" = 1'-0"

PLUMBING GENERAL NOTES:

A. REFER TO THE PLUMBING FIXTURE SCHEDULES AND RISER DIAGRAMS FOR THE SIZES OF BRANCH PIPES OF FIXTURES NOT SHOWN ON PLANS.

B. REFERS TO FIXTURE & EQUIPMENT DESIGNATION. SEE CORRESPONDING SPECIFICATION AND EQUIPMENT SCHEDULE FOR FURTHER INFORMATION. 1

C. ESPRESSO MACHINE,COFFEE BREWER, COFFEE DISPENSER & ICE MACHINE SHALL BE PROTECTED AGAINST BACKFLOW BY A BACKFLOW PREVENTER CONFORMING TO ASSE 1022 OR ASSE 1024 OR PROTECTED BY AN AIR GAP.

D. PROVIDE THERMOSTATIC MIXING VALVE AT ALL LAVATORIES AND PITCHER SINKS, SET TO 110°F, COMPLYING WITH ASSE 1070.

E. PROVIDE WATER HAMMER ARRESTOR AT EVERY QUICK CLOSING VALVE OF PLUMBING FIXTURES.

DOMESTIC WATER FLOOR PLAN KEYNOTES:

1. 3/4"Ø CW PIPE DN TO WC-1.
2. 1/2"Ø CW, 1/2"Ø HW & 1/2"Ø HWR PIPE DN TO L-1.
3. 3/4"Ø CW & 3/4"Ø HW PIPE DN TO EQ-20.
4. 1/2"Ø FW PIPE DN TO EQ-1.
5. 1/2"Ø FW PIPE DN TO EQ-4.
6. 3/4"Ø CW & 3/4"Ø HW PIPE DN TO 3-CS.
7. 1/2"Ø CW & 1/2"Ø HW PIPE DN TO EQ-7.
8. 1/2"Ø CW PIPE DN TO EQ-10.
9. 1/2"Ø FW PIPE DN TO EQ-11.
10. PROVIDE A 1/2-INCH COLD WATER LINE TO SERVE THE FLOOR DRAIN TRAP PRIMER. REFER TO THE PLUMBING SCHEDULE AND DETAIL 7 FOR ADDITIONAL INFORMATION. 2

0 3 6 9 12 15 ft

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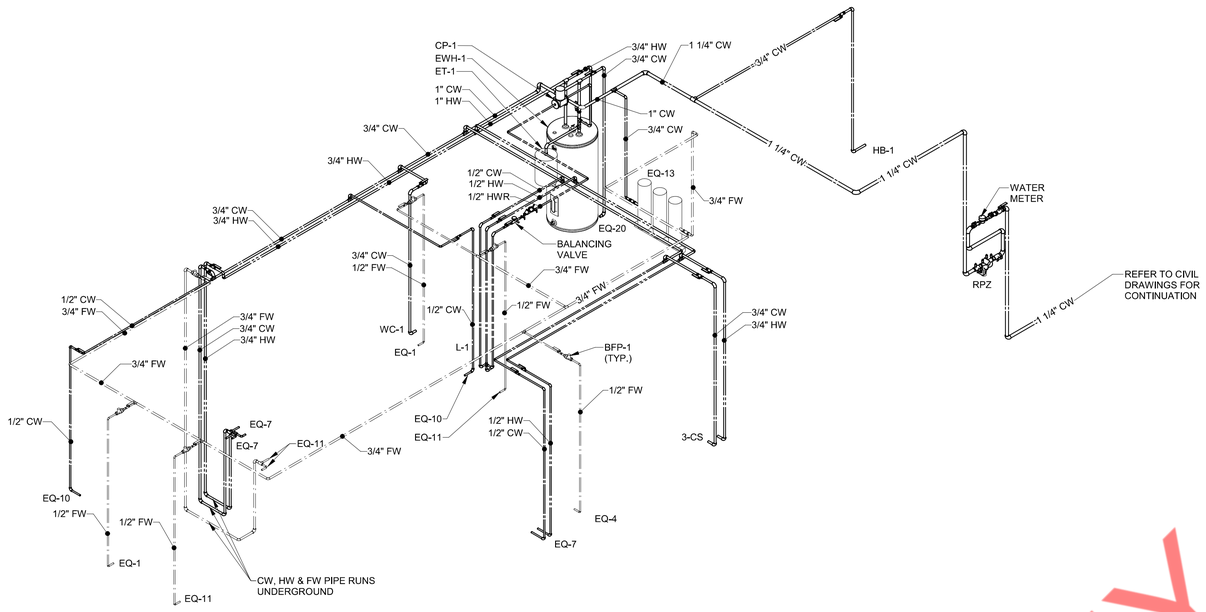
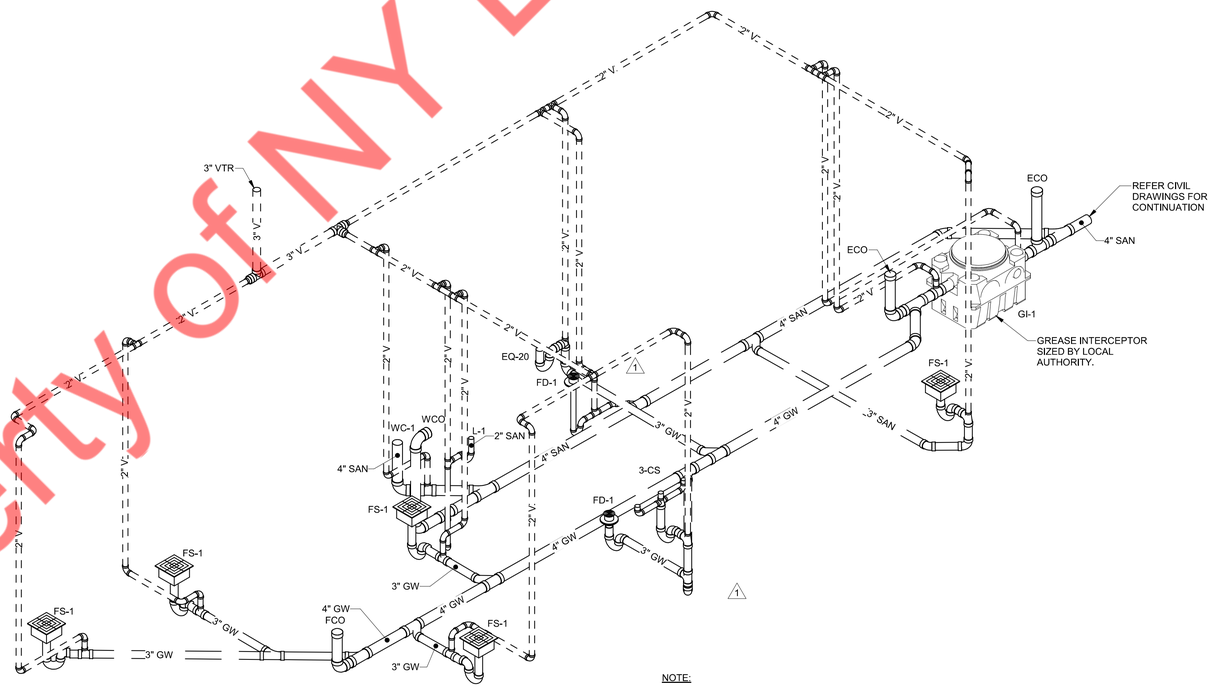
CONTENTS: DOMESTIC WATER FLOOR PLAN

P2.0



1 DOMESTIC WATER RISER DIAGRAM
SCALE: N.T.S.



NOTE:

ALL WASTE PIPING BELOW FLOOR STRUCTURE TO BE INSTALLED ON SITE BY SITE CONTRACTOR VERIFY DIRECTION OF FLOW & LOCATION OF GREASE INTERCEPTOR

2 SANITARY RISER DIAGRAM
SCALE: N.T.S.

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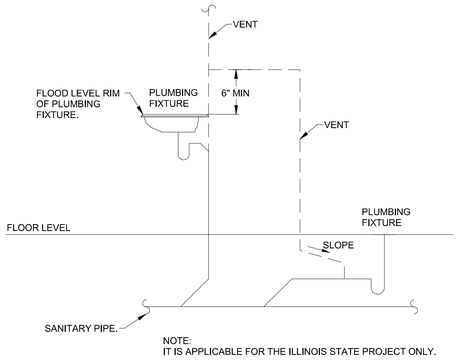
CONTENTS: PLUMBING RISER DIAGRAMS

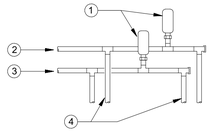
P3.0



NOTE:
IT IS APPLICABLE FOR THE ILLINOIS STATE PROJECT ONLY.

1 PLUMBING VENT CONNECTION DETAIL

SCALE: N.T.S.



GENERAL NOTES:
1. WATER HAMMER ARRESTOR (WHA) SIZE ACCORDING TO MODEL NO. 1260XL-A (ZURN) & 15M2 (WATTS)

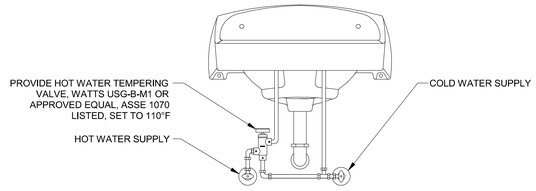
(#) KEY NOTES:

1. WATER HAMMER ARRESTOR (WHA) INSTALL AHEAD OF LAST FIXTURE SERVED BY BRANCH. (TYP)
2. CW PIPE
3. HW PIPE
4. CONNECT TO FIXTURE

WATER ARRESTOR SCHEDULE		
P.I.D. SYMBOL	FIXTURE UNIT RATING	SIZE (INCH.)
A	1-11	1/2"
B	12-32	3/4"
C	33-60	1"
D	61-113	1"

2 WATER HAMMER ARRESTOR DETAIL

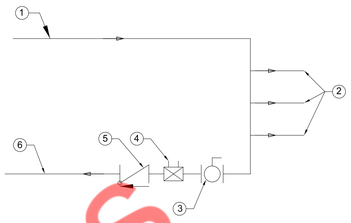
SCALE: N.T.S.



NOTE:
1. PROVIDE TRAP AND SUPPLY INSULATION AS REQUIRED. SEE SPECIFICATIONS.
2. PROVIDE A HOT WATER TEMPERING VALVE WHERE THE WATER TEMPERATURE EXCEEDS 110°F. TEMPERING VALVE SHALL COMPLY WITH ASSE 1070.
3. TYPICAL AT ALL HAND SINKS AND LAVATORIES U.N.O.

3 LAVATORY AND HANDSINK TEMPERING VALVE DETAIL

SCALE: N.T.S.

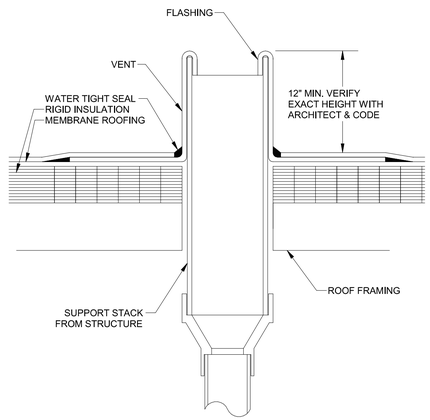


(#) KEY NOTES:

1. HOT WATER SUPPLY LINE FROM WATER HEATER.
2. PLUMBING FIXTURES.
3. BALL VALVE.
4. BALANCING VALVE / CIRCUIT SETTER (REFER PLAN FOR SET FLOW)
5. CHECK VALVE.
6. HOT WATER CIRCULATION LINE TO WATER HEATER.

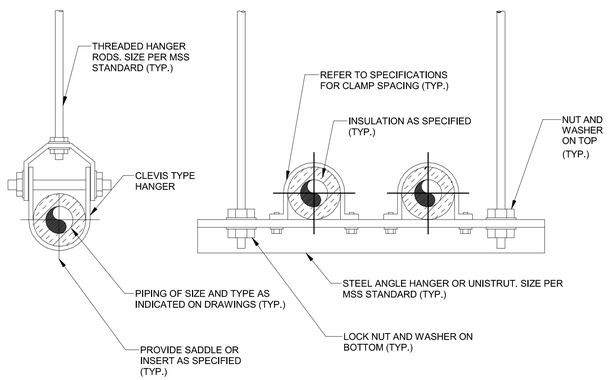
4 HOT WATER RETURN & FLOW CONTROL DEVICE CONNECTION DETAIL

SCALE: N.T.S.



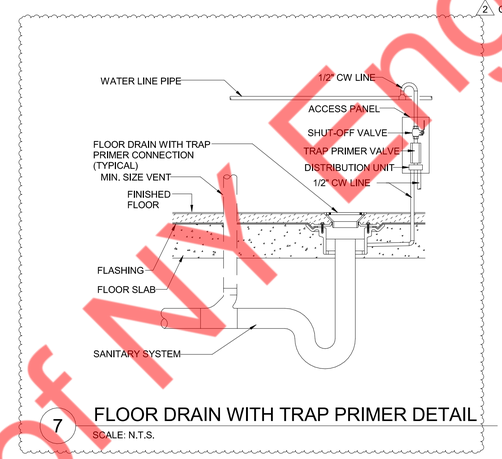
5 VENT THROUGH ROOF (VTR) DETAIL

SCALE: N.T.S.



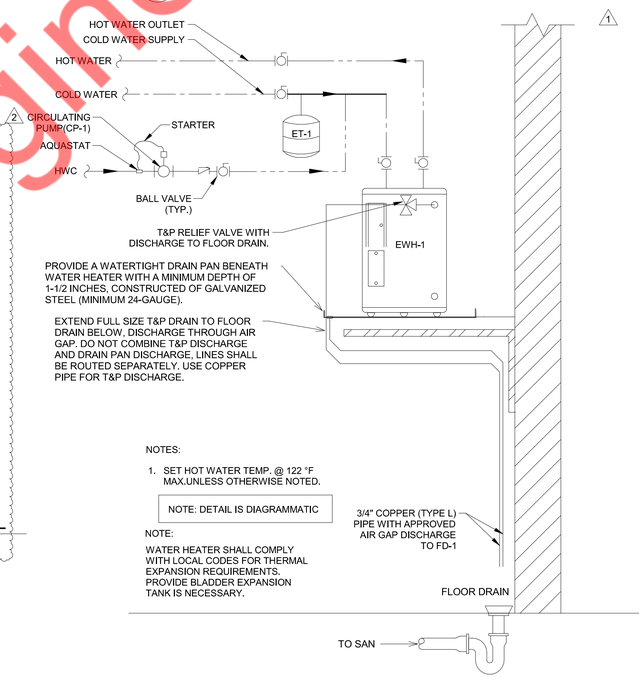
6 TYPICAL PIPE HANGER DETAIL

SCALE: N.T.S.



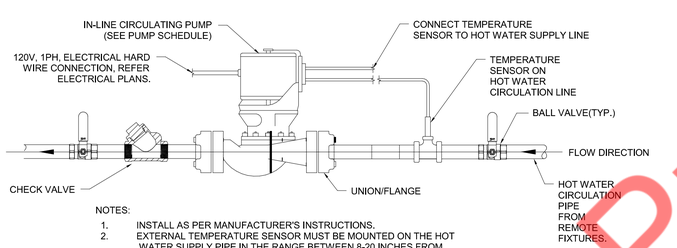
7 FLOOR DRAIN WITH TRAP PRIMER DETAIL

SCALE: N.T.S.



8 ABOVE MOP BASIN MOUNTED ELECTRIC WATER HEATER CONNECTION DETAIL

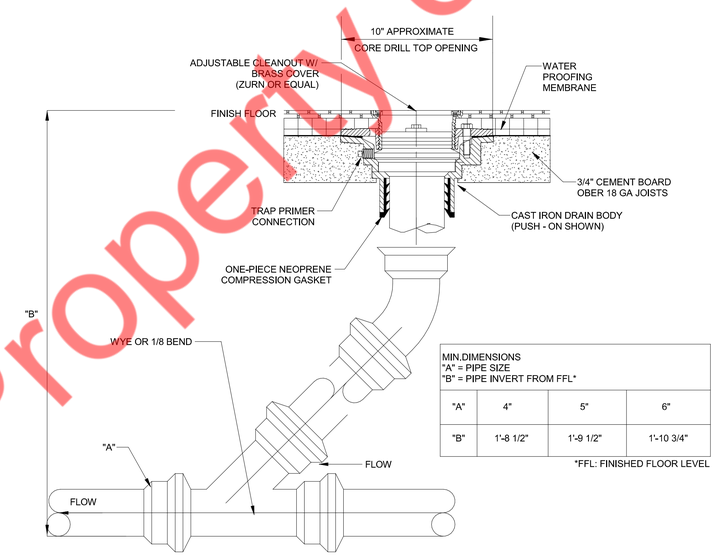
SCALE: N.T.S.



NOTES:
1. INSTALL AS PER MANUFACTURER'S INSTRUCTIONS.
2. EXTERNAL TEMPERATURE SENSOR MUST BE MOUNTED ON THE HOT WATER SUPPLY PIPE IN THE RANGE BETWEEN 8-20 INCHES FROM THE WATER HEATER AND THE LENGTH OF THE WIRE IS 8 FT.

9 INLINE HOT WATER RECIRCULATION PUMP DETAIL

SCALE: N.T.S.

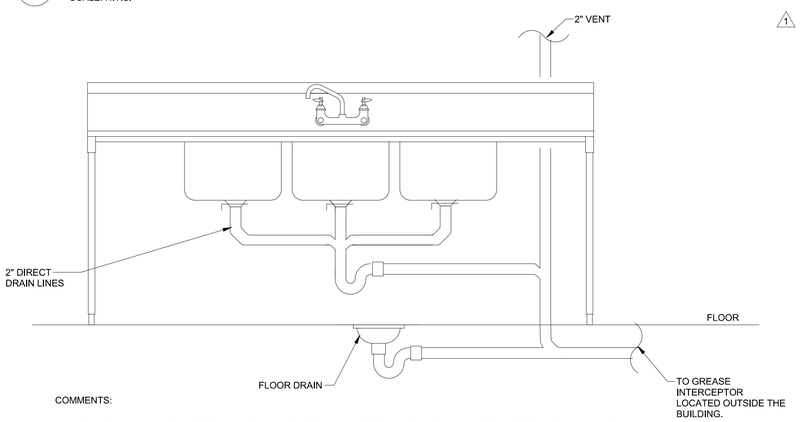


MIN.DIMENSIONS "A" = PIPE SIZE "B" = PIPE INVERT FROM FFL*			
"A"	4"	5"	6"
"B"	1'-8 1/2"	1'-9 1/2"	1'-10 3/4"

*FFL: FINISHED FLOOR LEVEL

10 TYPICAL CLEANOUT TO FINISHED FLOOR

SCALE: N.T.S.



COMMENTS:
1. ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS OR MEET LOCAL CODE REQUIREMENTS.

11 3 COMPARTMENT SINK AND GREAE INTERCEPTOR ARRANGEMENT

SCALE: N.T.S.

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CONTENTS: PLUMBING DETAILS

P4.0

PLUMBING FIXTURE SCHEDULE

SYMBOL	MANUFACTURER	MODEL	FIXTURE	MOUNTING	HW	CW	WASTE	VENT	ACCESSORIES / REMARKS	IMAGES
WC-1	KOHLER	K-3493	WATER CLOSET	FLOOR	-	3/4"	4"	2"	TWO PIECE DESIGN, 1.6 GPF, ASME A112.19.2/CSA B45.1, ADA, GRAVITY TYPE FLOOR MOUNTED WATER CLOSET.	
L-1	KOHLER	K-2031	LAVATORY	WALL	1/2"	1/2"	2"	2"	WALL-MOUNT WITH OVERFLOOW DRAIN, VITREOUS CHINA, LENGTH: 20-3/4" x WIDTH: 18-1/4" ASME A112.19.2, ADA, IAPMO/UPC, CSA B45 FAUCET: EUROCO COSMOPOLITAN E MODEL ELECTRONIC FAUCET	
FS-1	SIOUX CHIEF OR EQUAL	861-3-PI-D	FLOOR SINK	FLOOR	-	-	3"	2"	FLOOR SINK SHALL BE MODELED FROM IMPACT- MODIFIED PVC WITH SCH. 40 HUB CONNECTION, WHICH CONFORMS TO ASTM D2665 DESIGNED IN ACCORDANCE WITH ASME A112.6.7-01.	
FCO	J.R. SMITH OR EQUAL	4020 SERIES	FLOOR CLEANOUT	FLOOR	-	-	REFER TO FLOOR PLAN	-	NO-HUB OUTLET, DUCO CAST IRON CLEANOUT WITH ROUND ADJUSTABLE SCORIATED NICKEL BRONZE ROUND TOP. VANDAL PROOF TOP.	
WCO	ZURN OR EQUAL	Z-1446	WALL CLEANOUT	WALL	-	-	SEE REMARKS	-	MATCH CONNECTED PIPE SIZE UP TO 4". SECONDARY CLOSURE PLUG.	
ECO	ZURN OR EQUAL	Z1400	EXTERIOR CLEAN OUT	FLOOR	-	-	REFER TO FLOOR PLAN	-	EXTRA HEAVY DUTY "LEVEL-TROL" ADJUSTABLE FLOOR CLEANOUT	
PIPE HANGERS	B-LINE OR EQUAL	B3170	PIPE HANGERS	-	-	-	-	-	PRE GALVANIZED, AVAILABLE IN STAINLESS STEEL MATERIAL, FACTORY MUTUAL ENGINEERING APPROVED.	
BALL VALVES	APOLLO / CONBRACO OR EQUAL	-	BALL VALVES	-	-	-	-	-	FULL PORT, BRASS BODY, 600 WOG	
HB-1	WOODFORD	MODEL 17 OR EQUAL	HOSE BIBB	FLOOR	3/4"	-	-	-	FREEZELESS WALL HYDRANT, ANODIZED ALUMINUM BOX. ASSE STANDARD 1052 APPROVED NIDEL MODEL 50HA DOUBLE CHECK BACKFLOW PREVENTER.	
BFP-1	WILKINS OR EQUAL	WILKINS 740	BACKFLOW PREVENTOR	-	-	-	-	-	ASSE-1022 APPROVED	
RPZ	-	-	REDUCED PRESSURE ZONE	-	-	-	-	-	MANUFACTURER AND MODEL NO AS APPROVED BY LOCAL DEPARTMENT OF WATER. PRESSURE DROP SHALL NOT BE EXCEED MORE THAN 7 PSI.	
FD-1	ZURN	ZN-415-6B	FLOOR DRAIN	FLOOR	-	-	3"	2"	6", DURA BRONZE TOP, BOTTOM OUTLET, ADJUSTABLE COLLAR	
TP-1	PRIME-RITE OR EQUAL	PR-500	TRAP PRIMER	-	-	1/2"	-	-	CORROSION-RESISTANT BRASS BODY, 'O'-RING SEALS, 1/2" INLET & OUTLET AND INTEGRAL VACUUM BREAKER. PROVIDE DISTRIBUTION AS REQUIRED.	

NOTE:
1. REFER TO ARCHITECTURE, OWNERSHIP OR INTERIOR DESIGNER FOR ALL FIXTURE SELECTION AND ACCESSORIES. ALL ARE SUBJECT TO CHANGE.

EQUIPMENT SCHEDULE

TAG	QTY	DESCRIPTION	MAKE AND MODEL	FILTERED WATER (INCH)	COLD (INCH)	HOT (INCH)	DIRECT WASTE (INCH)	INDIRECT WASTE (INCH)	REMARKS
3-CS	1	3-COMPARTMENT SINK WITH DRAINBOARD	ADVANCE TABCO / 93-3-54	-	3/4"	3/4"	-	1-1/2"	70"L x 42"W x 24" D
1	2	ESPRESSO MACHINE	LA MARZOCCO / LINEA PB (AV) 3 GROUP	1/2"	-	-	-	3/4"	-
4	1	COFFEE BREWER	BUNN / ITCB TWIN HV, 120/240V	1/2"	-	-	-	1/2"	31"H x 181/2"W x 23" D
7	3	PITCHER RINSER	-	-	1/2"	1/2"	-	2"	-
10	2	DIPPER WELL	-	-	1/2"	-	-	3/4"	-
11	4	ICE MACHINE	MANITOWOC ICE / IYT-0500A ON D-570 BIN	1/2"	-	-	-	1/2"	-
13	1	WATER SOFTENER	-	-	3/4"	-	-	-	-
20	1	MOP SINK	-	-	3/4"	3/4"	3"	-	-

NOTE:
1. REFER TO ARCHITECTURE, OWNERSHIP OR FOOD AND SERVICE DRAWING FOR ALL FIXTURE/ EQUIPMENTS SELECTION AND ACCESSORIES. ALL ARE SUBJECT TO CHANGE.

STORAGE TANK ELECTRIC WATER HEATER SCHEDULE

TAG	TYPE	QTY.	LOCATION	TANK CAPACITY (GALLONS)	TEMPERATURE RISE (°F)	RECOVERY IN G.P.H. @ TEMP RISE	WATER CONNECTION SIZE (IN.)	ELECTRICAL DATA					WEIGHT (LBS)	DIMENSION (IN.) (DIA. X H)	MODEL	MANUFACTURER
								OPERATION	PER ELEMENT WATTAGE (kW)	UPPER ELEMENT	LOWER ELEMENT	V/Ph/Hz	TOTAL WATTAGE (KW)			
EWH-1	ELECTRICAL	1	REFER TO PLAN	50	100	36	3/4" Ø	SIMULTANEOUS	4.5	1	1	208 / 3 / 60	9.0	125	20-1/2" Ø X 59	DEN-40	AO SMITH

NOTES:
1. INSTALL AS PER THE MANUFACTURER'S INSTRUCTIONS.
2. TO REDUCE THE RISK OF EXCESSIVE PRESSURE AND TEMPERATURE IN THIS WATER HEATER INSTALL TEMPERATURE AND PRESSURE PROTECTIVE EQUIPMENT REQUIRED BY LOCAL CODES.
3. THE HEATER MAY NOT BE INSTALLED ON OR AGAINST COMBUSTIBLE SURFACE.
4. THE ELECTRICAL WATER HEATER STORAGE TANK SIZING IS CALCULATED BASED ON THE ASHRAE TABLE. UP-SIZING OF THE STORAGE TANK IS ALLOWED AS PER CLIENT REQUIREMENTS.
5. PROVIDE DRAIN PAN FOR WATER HEATER.

CIRCULATING PUMP SCHEDULE

TAG	TYPE	QTY.	LOCATION	FLOW (GPM)	HEAD (FEET)	FLANGE SIZE NPT (IN)	ELECTRICAL DATA		WEIGHT (LBS)	MODEL	BASIS OF DESIGN
							WATTS	V/Ph/Hz			
CP-1	CIRCULATING PUMP	1	SEE PLAN	3	10	3/4"	70	115/1/60	7	30-B	ASTRO

NOTES:
1. INSTALL AS PER THE MANUFACTURER'S INSTRUCTIONS.
2. THE PUMP SHALL BE CAPABLE OF TEMPERATURE-BASED CONTROLS.
3. PROVIDING A TEMPERATURE SENSOR/THERMOSTAT ON THE RECIRCULATING WATER LINE AND CONNECT TO THE PUMP.

THERMOSTATIC MIXING VALVE SCHEDULE

TAG NO.	DESCRIPTION	CONNECTION		MODEL	BASIS OF DESIGN	COMMENTS
		COLD	HOT			
TMV-1	THERMOSTATIC MIXING VALVE	3/8"	3/8"	170 LF	LEONARD	ASSE#1070

EXPANSION TANK SCHEDULE

SYMBOL	QTY.	TANK VOLUME (GAL)	MAX. ACCEPTANCE FACTOR	MAX. ACCEPT. VOLUME (GAL)	TYPE	DIAPHRAGM MATERIAL	MAX. OPERATING TEMPERATURE (°F)	MAX. WORKING PRESSURE (PSIG)	DIMENSION(IN.) (DIA. X H)	SHIPPING WEIGHT (LBS)	MODEL	BASIS OF DESIGN
ET-1	1	2.0	0.45	0.9	REPLACEABLE BLADDER	HEAVY DUTY BUTYL	200	150	8" Ø X 13"	5	ST-5	AMTROL

NOTES:
1. INSTALL AS PER THE MANUFACTURER'S INSTRUCTIONS.
2. PROVIDE WITH STANDARD SCHRADER TIRE VALVE CONNECTION.
3. ADJUST CHARGE PRESSURE ON SITE AS REQUIRED.

PLUMBING FIXTURE DEMAND TABULATION

FIXTURE	DESCRIPTION	OCCUPANCY	QTY.	DRAINAGE FIXTURE UNITS	SUB-TOTAL	LOAD VALUES IN WATER (EACH) SUPPLY FIXTURE UNITS (WSFU)			LOAD VALUES IN WATER (TOTAL) SUPPLY FIXTURE UNITS (WSFU)			REMARK
						COLD	HOT	TOTAL	COLD	HOT	TOTAL	
WC-1	WATER CLOSET	PUBLIC	1	4	4	2.5	0.0	2.5	2.5	0.0	2.5	
L-1	LAVATORY	PUBLIC	1	1	1	0.75	0.75	1.0	0.75	0.75	1.0	
20	MOP BASIN	PUBLIC	1	2	2	2.3	2.3	3.0	2.3	2.3	3.0	
21	PITCHER SINK	PUBLIC	3	2	6	1.125	1.125	1.5	3.375	3.375	4.5	
3-CS	3 COMPARTMENT SINK	PUBLIC	1	2	2	3.0	3.0	4.0	3.0	3.0	4.0	
7	ICE MACHINE	PUBLIC	4	1	4	0.5	0.0	0.5	2.0	0.0	2.0	
8	ESPRESSO MACHINE	PUBLIC	2	1	2	0.5	0.0	0.5	1.0	0.0	1.0	
27	DIPPER WELL	PUBLIC	2	1	2	0.5	0.0	0.5	1.0	0.0	1.0	
20	COFFEE BREWER	PUBLIC	1	1	1	0.5	0.0	0.5	0.5	0.0	0.5	
HB-1	HOSE BIBB	PUBLIC	1	-	-	2.5	0.0	0.0	2.5	0.0	2.5	2
FD-1	FLOOR DRAIN	PUBLIC	2	5	10	-	-	-	-	-	-	
FS-1	FLOOR SINK	PUBLIC	6	5	30	-	-	-	-	-	-	
TOTALS					64	DFU			19	9.5	22	WSFU
DFU = DRAINAGE FIXTURE UNITS					EIGHTH	INCH SLOPE PER FOOT			19.2	14	21	GPM
WSFU = WATER SUPPLY FIXTURE UNITS					4"	DIAMETER OF PIPE (INCHES)			1"	1"	1-1/4"	INCHES REQ'D.

PIPING MATERIALS SCHEDULE

PLAN TAG	PLUMBING SYSTEM DESCRIPTION	INSTALLATION	SIZES	SYSTEM MATERIAL AND FITTING SPECIFICATION
SAN	SANITARY (SOIL) PIPING	SUSPENDED	2-1/2" AND SMALLER	SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
			3" AND LARGER	SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
		BURIED	3" AND LARGER	SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
V	VENT PIPING (ALL SYSTEMS)	SUSPENDED	2-1/2" AND SMALLER	SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
				SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
			3" AND LARGER	SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
				SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
		BURIED	2" AND LARGER	SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
				SANITARY PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) PER ASTM D 2665, WITH GASKETS PER ASTM C 1440, ELASTOMERIC SEAL
CW	DOMESTIC COLD WATER DISTRIBUTION	SUSPENDED	2" AND SMALLER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-B) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1807, F2159
			2 1/2" AND LARGER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-A) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1960, F2080
				COPPER PIPE, ASTM B88, DRAWN TYPE L AND K WITH WROUGHT COPPER PRESSURE FITTINGS, SOLDERED, ASME B16.22
		BURIED	2" AND SMALLER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-B) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1807, F2159
			2 1/2" AND LARGER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-A) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1960, F2080
				COPPER PIPE, ASTM B88, DRAWN TYPE L AND K WITH WROUGHT COPPER PRESSURE FITTINGS, SOLDERED, ASME B16.22
HW & HWR	DOMESTIC HOT WATER DISTRIBUTION	SUSPENDED	2" AND SMALLER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-B) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1807, F2159
			2 1/2" AND LARGER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-A) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1960, F2080
				COPPER PIPE, ASTM B88, DRAWN TYPE L AND K WITH WROUGHT COPPER PRESSURE FITTINGS, SOLDERED, ASME B16.22
		BURIED	2" AND SMALLER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-B) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1807, F2159
			2 1/2" AND LARGER	DOMESTIC PIPE SHALL BE POLYETHYLENE CROSSLINK(PEX-A) PIPE PER ASTM F876 F877, WITH FITTINGS PER ASTM F1960, F2080
				COPPER PIPE, ASTM B88, DRAWN TYPE L AND K WITH WROUGHT COPPER PRESSURE FITTINGS, SOLDERED, ASME B16.22

NOTE:
1. THE MATERIALS ARE SUBJECT TO CHANGE WITH APPROVAL OF ARCHITECTURE OR OWNER.

GREASE INTERCEPTOR CALCULATIONS (LOCAL CODE GOVERNS)

ITEM NO.	QTY.	DESCRIPTION	DFU	DFU (TOTAL)	SINK BOWL INFORMATION				LIQUID HOLDING CAPACITY (GAL.) CODE	FLOW RATE (GPM)
					BOWL QTY.	LENGTH	WIDTH	DEPTH		
3-CS	1	3 COMP. SINK	-	-	3	20"	16"	12"	38	19
21	3	PITCHER SINK	-	-	1	10"	14"	9"	12	6
32	1	MOP BASIN	-	-	1	20"	20"	10"	13	6
FS-1	5	FLOOR SINK	4	20	-	-	-	-	-	10
TOTAL										41

NOTES:
1. REFER TO SECTION 1014.2.1 HYDOMECHANICAL GREASE INTERCEPTOR AS PER NORTH DAKOTA PLUMBING CODE (UPC 2018).
2. GREASE INTERCEPTOR SIZED BY LOCAL AUTHORITY

GREASE INTERCEPTOR SCHEDULE

MARK	MANUFACTURER	QTY.	MODEL	MOUNTING	LOCATION	FLOW RATE G.P.M.	GREASE HOLDING CAPACITY (LBS.)	UNIT DIMENSIONS (IN)			INLET / OUTLET
								LENGTH	WIDTH	HEIGHT	
GI-1	SCHIER	1	GB-50	BELOW GRADE	SEE PLAN	50	439.5	37"	32-1/4"	28-1/2"	4"

NOTES:
1. PROVIDE INTERCEPTOR EXTENSIONS AS REQUIRED TO ACHIEVE REQUIRED INVERTS.
2. VERIFY GREASE INTERCEPTOR WITH LOCAL AUTHORITY PRIOR TO INSTALLATION.

ELECTRIC HEAT TRACING CABLE SCHEDULE FOR SANITARY DRAINAGE PIPING

MAKE	MODEL	ELECTRICAL DATA				DISCIPLINE	FLOOR (AREA)	REMARK
		VOLTAGE	APPROX LENGTH (FT.)	WATTS/ FT	AMPS			
RAYCHEM	5XL1-CR	120	200	4.5 W/FT	20	PLUMBING	REFER PLAN	• PROVIDE CONNECTION KITS AND ACCESSORIES, SPLICES, POWER CONNECTIONS, TEE KITS CROSS CONNECTIONS, TAPE, ETC • PROVIDE AN AMBIENT THERMOSTAT SENSING RTD-200 BY RAYCHEM • PROVIDE ONE CONTROLLER ACS-30 FOR ALL DATA ELECTRIC CIRCUITS. • PROVIDE MAX. FIVE(5) CIRCUITS PER PANEL ACS-PCM2-5

NOTE:
1. PROVIDE CLEARANCES AS PER MANUFACTURER RECOMMENDATIONS.
2. COORDINATE WITH THE ELECTRICAL CONTRACTOR TO CONFIRM POWER REQUIREMENTS FOR THE HEAT TRACE SYSTEM.

DAILY PERKS

#	DATE	REVISION
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS
2	2026-01-05	BD COMMENTS - 2

DATE: 2025-07-02
CONTENTS: PLUMBING SCHEDULES

P5.0

ELECTRICAL SYMBOLS LIST

LIGHTING

	LIGHTING FIXTURE, HALF SHADED FIXTURE OR "NL" INDICATES NIGHT LIGHT FIXTURES, U.O.N.
A 2 a	LUMINAIRE TYPE : INDICATE BY UPPERCASE LETTER SEE LIGHTING FIXTURE SCHEDULE. CIRCUIT NUMBER : INDICATED BY NUMBER 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 EXIT SIGN WITH DIRECTIONAL ARROWS AS INDICATED. SHADED AREA DENOTES FACE(S).
	EMERGENCY BATTERY UNIT

SWITCHES AND CONTROLS

$D	DIMMER SWITCH
OS	CEILING OCCUPANCY SENSOR
$OS	WALL MOUNTED OCCUPANCY SENSOR SWITCH
$	MANUAL SWITCH
T	TIME CLOCK

WIRING SYSTEMS

3 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 ∅, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3, 5 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2 POLE IS 2 HOT WIRES,1 NEUTRAL AND 1 GROUND IN 3/4"C, UNLESS OTHERWISE NOTED.
3, 5, 7 UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3 PHASE IS 3 HOT WIRES,1 NEUTRAL AND 1 GROUND IN 3/4"C, UNLESS OTHERWISE NOTED.
	CONDUIT TURNING UP, SEE FLOOR PLANS FOR CONDITIONS.
	CONDUIT TUIRNING DOWN, SEE FLOOR PLANS FOR CONDITION.
	CONDUIT AND WIRE TO BUILDING GROUND.
	EXISTING
	NEW

ELECTRICAL DRAWING LIST

E0.1	ELECTRICAL SYMBOLS AND GENERAL NOTES
E1.0	ELECTRICAL FLOOR PLAN
E2.0	ELECTRICAL RISER DIAGRAM AND SCHEDULES
E3.0	ELECTRICAL DETAILS
E4.0	ENERGY COMPLIANCE

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE
D	DEDICATED SIMPLEX RECEPTACLE, +18" AFF OR AS NOTED.
	DUPLEX CONVENIENCE RECEPTACLE
D	DEDICATED DUPLEX GFI RECEPTACLE
GFI	DUPLEX GFI RECEPTACLE
IG	DUPLEX ISOLATED GROUNDED RECEPTACLE
	DATA OUTLET WITH CAT 6 CABLE

MOTORS AND CONTROLS

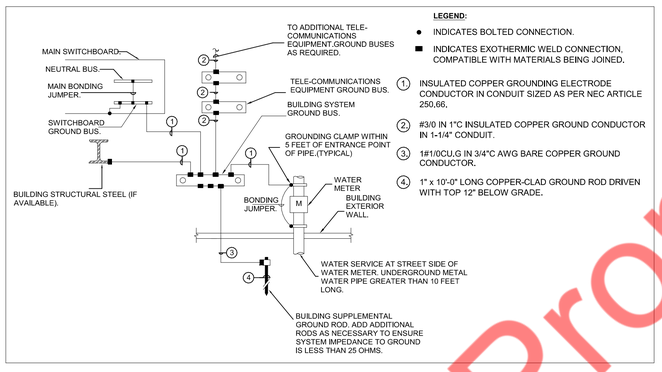
M SM	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
	DISCONNECT SWITCH
	SERVICE DISCONNECT (FUSED) SWITCH
	CT METER

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
X	KEYED NOTE REFERENCE

POWER DISTRIBUTION

	BRANCH PANELBOARD, SIZE AS NOTED.



1 BUILDING GROUNDING ELECTRODE SYSTEM
N.T.S.

ELECTRICAL ABBREVIATIONS

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

GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)

1. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH THE 2023 NORTH DAKOTA ELECTRICAL CODE AND ALL LOCAL CODE AMENDMENTS. (2, 1)
2. A COMPLETE GROUNDING SYSTEM SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH ARTICLE 250 OF THE NEC, AND AS SHOWN ON THE DRAWINGS.
3. CONDUCTORS SHALL BE COPPER RATED AT NOT LESS THAN 600 VOLTS. MINIMUM SIZE SHALL BE #12 AWG UNLESS OTHERWISE NOTED ON THE DRAWINGS. ALL WIRE #8 AWG AND LARGER SHALL BE STRANDED. ALL CONDUCTORS #10 AND SMALLER SHALL BE SOLID, UNLESS OTHERWISE NOTED.
4. BRANCH CIRCUIT CONDUCTORS SHALL BE TYPE THHN OR THWN AS REQUIRED.
5. PROVIDE A TYPED DIRECTORY IN ALL PANELBOARDS CLEARLY DESCRIBING THE LOCATION OF AND TYPE OF LOAD BEING SERVED FOR ALL CIRCUITS.
6. PHENOLIC NAMEPLATES FOR ALL PANELBOARDS AND DISCONNECT SWITCHES, BLACK LETTERS ON WHITE BACKGROUND.
7. VERIFY ALL REQUIREMENTS AND COORDINATE EXACT LOCATION OF INCOMING ELECTRICAL SERVICE WITH LOCAL POWER COMPANY. PRIOR TO PROJECT START-UP, NOTIFY ENGINEER OF ANY CHANGES AS MAY BE REQUIRED.

APPLICABLE CODES

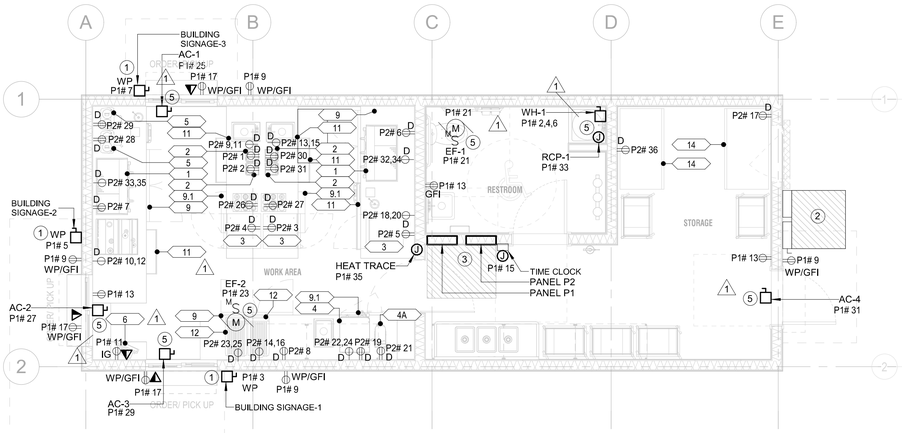
- INTERNATIONAL BUILDING CODE, 2021
- INTERNATIONAL MECHANICAL CODE, 2021
- INTERNATIONAL ENERGY CONSERVATION CODE, 2021
- NORTH DAKOTA ELECTRICAL CODE, 2023 (ADOPTS WITH AMENDEMENTS OF NEC 2023) (2)

DAILY PERKS

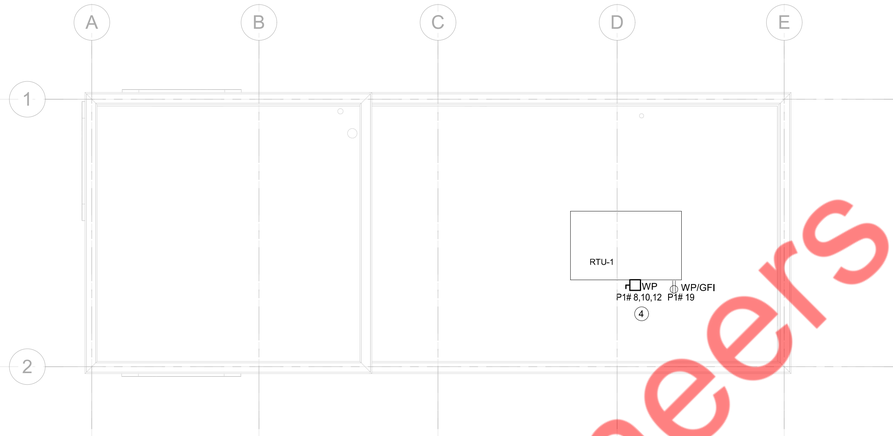
#	DATE	REVISION
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS
2	2026-01-05	BD COMMENTS - 2

DATE: 09-10-2025
CONTENTS: ELECTRICAL SYMBOLS AND GENERAL NOTES

E0.1



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



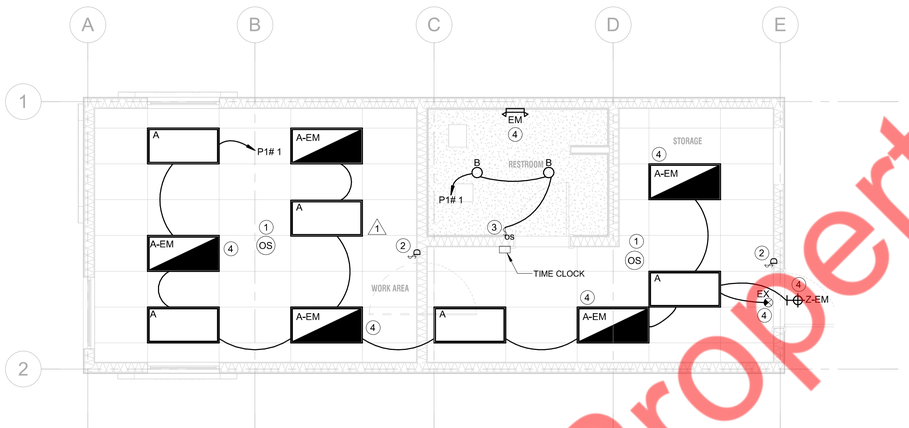
2 ROOF POWER PLAN
1/4" = 1'-0"

POWER PLAN GENERAL NOTES:

1. MAXIMUM VOLTAGE DROP FOR FEEDER AND BRANCH CIRCUIT CONDUCTORS COMBINED, SHALL NOT EXCEED A 5% VOLTAGE DROP.
2. PROVIDE SERVICE EQUIPMENT AIC MARKING PER NEC 110.24(A) AND 110.24 (B) FOR MODIFICATIONS IF REQUIRED.
3. ALL BRANCH CIRCUIT HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO THE PANEL & CIRCUIT NUMBER AS INDICATED.
4. REFER TO E0.1 FOR ELECTRICAL SYMBOLS, GENERAL NOTES & ABBREVIATIONS.
5. 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.
6. SEE ARCHITECTURAL ELEVATIONS FOR PLACEMENT OF DEVICES.
7. REFER TO ARCHITECTURAL SET FOR KITCHEN EQUIPMENT PLAN & SCHEDULE. VERIFY THE BREAKER, CABLE, ELECTRICAL LOAD AND CONDUIT REQUIREMENT, SIZES, RATINGS FOR ALL KITCHEN EQUIPMENTS/MECHANICAL EQUIPMENTS WITH EQUIPMENT SUPPLIER/MANUFACTURER AND PROVIDE THE ELECTRICAL CONNECTION ACCORDINGLY.
8. DUPLEX RECEPTACLES SHALL BE MOUNTED AT 18" AFF UNLESS NOTED OTHERWISE ON DRAWINGS OR SCHEDULES.
9. ALL EXTERIOR WEATHERPROOF OUTLETS SHALL COMPLY WITH NEC ARTICLE 406.4(D)(6) AND 406.9 FOR WEATHER-RESISTANT RECEPTACLES.

POWER PLAN & ROOF KEY NOTES:

1. PROVIDE 1P-20A TOGGLE, WEATHER PROOF DISCONNECT, ON/OFF CONTROL VIA LUTRON ATHENA SYSTEM. PROVIDE CIRCUIT THRU TIMECLOCK/PHOTOCELL AND CONNECT TO PANEL 'P1'. PROVIDE NECESSARY POWER CONNECTIONS AND CONDUIT.
2. LOCATION OF UTILITY CT METER & SERVICE DISCONNECT IN NEMA 3R ENCLOSURE.
3. MAINTAIN CLEARANCE FOR ELECTRICAL PANELS PER NEC 110.26 (A) (1).
4. THE ELECTRICAL DISCONNECT & CONVENIENCE OUTLET FOR THE RTU IS FACTORY-MOUNTED. LOCATE DISCONNECT AS REQUIRED TO MAINTAIN NEC CLEARANCES.
5. COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENTS & CONTROLS OF MECHANICAL/PLUMBING EQUIPMENTS WITH MECHANICAL/PLUMBING CONTRACTOR. PROVIDE THE ELECTRICAL CONNECTION AS PER FINAL MECHANICAL/PLUMBING EQUIPMENTS REQUIREMENTS IN FIELD.



3 LIGHTING PLAN
1/4" = 1'-0"

0 3 6 9 12 15 ft

LIGHTING FIXTURE SCHEDULE

TAG	LUMINAIRE DESCRIPTION	MANUFACTURERS & CATALOGUE NUMBER	LAMP VA	QUANTITY	VOLTAGE	MOUNTING	CONTROL TYPE	Mark
A	2'X4' FLAT PANEL	PROVIDED BY OWNER/ARCHITECT	50	5	120	RECESSED	0-10V DIM	FINAL LIGHT FIXTURE & SPECIFICATIONS TO BE COORDINATED WITH FRANCHISE/OWNER/ARCHITECT
A-EM	2'X4' FLAT PANEL WITH 90 MINUTES BATTERY BACKUP	PROVIDED BY OWNER/ARCHITECT	50	5	120	RECESSED	0-10V DIM	FINAL LIGHT FIXTURE & SPECIFICATIONS TO BE COORDINATED WITH FRANCHISE/OWNER/ARCHITECT
B	6" RECESSED CAN LIGHT	PROVIDED BY OWNER/ARCHITECT	18.4	2	120	RECESSED	SWITCHED	FINAL LIGHT FIXTURE & SPECIFICATIONS TO BE COORDINATED WITH FRANCHISE/OWNER/ARCHITECT
EM	LED EMERGENCY WITH 90 MINUTES BATTERY BACKUP	SURE-LITES #APEL H2 SERIES OR EQUAL APPROVED MANUFACTURER	12	1	120	WALL/SURFACE	-	FINAL LIGHT FIXTURE & SPECIFICATIONS TO BE COORDINATED WITH FRANCHISE/OWNER/ARCHITECT
EX	EXIT SIGN WITH 90 MINUTES BATTERY BACKUP	#EXRG-EL-M6 OR EQUAL APPROVED MANUFACTURER	5	4	120	CEILING/SURFACE	-	FINAL LIGHT FIXTURE & SPECIFICATIONS TO BE COORDINATED WITH FRANCHISE/OWNER/ARCHITECT
Z-EM	WHITE THERMOPLASTIC WALL OR CEILING/PENDANT HEAD WITH TWO 6V LED HEADS, WITH REMOTE INTERIOR 90 MINUTES BATTERY	PHILIPS CHLORIDE: CLR-2"COLOR"-"WET" WITH CLU2-N-"COLOR"-2R-LH	24	1	120	WALL/SURFACE	-	FINAL LIGHT FIXTURE & SPECIFICATIONS TO BE COORDINATED WITH FRANCHISE/OWNER/ARCHITECT

LIGHTING SCHEDULE NOTE:

PROVIDE ALL LIGHTING CONTROLS IN COMPLIANCE WITH LATEST IECC AND ACOORDINGLY PROVIDE REQUIRED DEVICES, ACCESORIES, WIRING WITH NO ADDITIONAL COST FOR PROPER FUNCTIONING AND OPERATION OF LIGHTING SYSTEM.

LIGHTING GENERAL NOTES:

1. REFER TO ARCHITECTURAL PLANS FOR MOUNTING HEIGHTS OF DEVICES.
2. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT FIXTURE LOCATIONS FOR GENERAL LIGHTING.
3. ALL BRANCH CIRCUITS SHALL HAVE DEDICATED NEUTRAL CONDUCTOR AND FULLY SIZED INSULATED GROUNDING WIRE, INCLUDING IN MC CABLE. MULTIPLE CIRCUITS IN A COMMON RACEWAY MAY SHARE A COMMON GROUNDING WIRE.
4. ADJUST THE EMERGENCY AND EXIT LIGHTING QUATITIES/LOCATION AS REQUIRED TO MEET THE LOCAL AHJ REQUIREMENTS. LOCATE EXIT SIGNS AND DOWNLIGHTS IN THE CENTER OF CEILING TILES WHERE POSSIBLE.
5. PROVIDE AN UN-SWITCH HOT LEG TO ALL EMERGENCY AND EXIT FIXTURES. BATTERY EMERGENCY LIGHTING SHALL BE CONNECTED TO THE ROOM LIGHTING CIRCUIT, AHEAD OF ANY SWITCH OR CONTROL FOR CONTINUOUS OPERATION. EXIT SIGNS SHALL BE CONNECTED TO A DEDICATED, LOCK ON CIRCUIT AND SHALL BE PROVIDED WITH A DEDICATED FEEDER AND HOMERUN.
6. MAXIMUM VOLTAGE DROP FOR FEEDER AND BRANCH CIRCUIT CONDUCTORS COMBINED, SHALL NOT EXCEED A 5% VOLTAGE DROP.
7. LIGHTING FIXTURES WHICH ARE CONTROLLED BY A DIMMER SWITCH SHALL BE WIRED TO A CIRCUIT HAVING DEDICATED NEUTRAL WIRE.
8. REFER TO POWER PLAN FOR TIME CLOCK LOCATION.

LIGHTING KEY NOTES:

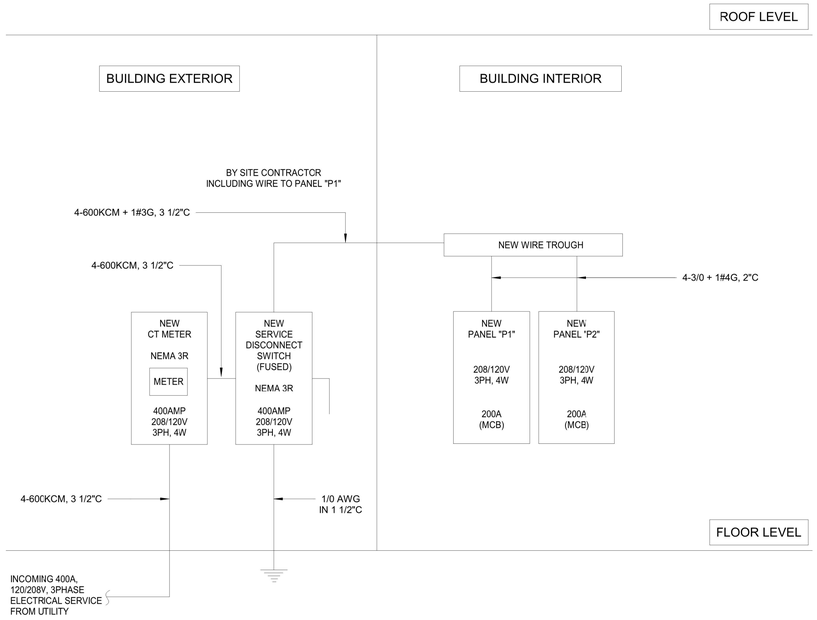
1. PROVIDE LOW VOLTAGE OCCUPANCY SENSOR. MANUAL ON/AUTOMATIC OFF. SET OFF TIME FOR 20 MINUTES.
2. DIMMER SWITCHES SHALL BE RATED FOR TOTAL LOAD OF SWITCHED CIRCUIT AND LAMP TYPE AS REQUIRED. DIMMERS SHALL BE PROVIDED WITH AN ON/OFF SWITCH.
3. WALL MOUNTED OCCUPANCY SENSOR, SET OFF TIME TO 20 MINUTES FOR RESTROOM, SET DIP SWITCH TO AUTOMATIC ON.
4. "EM" INDICATING EMERGENCY LIGHTING FIXTURE WITH 90 MINUTES BATTERY BACK. EMERGENCY LIGHTS SHALL BE CONNECTED TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROL FOR CONTINEOUS OPERATION.

DAILY PERKS

#	DATE	REVISION
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS
2	2026-01-05	BD COMMENTS - 2

DATE: 09-10-2025
CONTENTS: ELECTRICAL FLOOR PLAN

E1.0



RISER DIAGRAM GENERAL NOTES:

1. VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.
2. SERVICE EQUIPMENT SHALL BE MARKED TO INDICATED THE MAXIMJM AVAILABLE FAULT CURRENT AS REQUIRED BY NEC SECTION 110.24. THE FIELD MARKINGS SHALL INCLUDE THE DATE THE FAULT CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED. REQUEST A DATED LETTER WITH FAULT CURRENT INFORMATION FROM THE LOCAL UTILITY.
3. INFORMATION SHOWN IS DIAGRAMMATIC AND IS NOT INTENDED TO REPRESENT PHYSICAL ARRANGEMENTS, LOCATIONS, ROUTING OR CONNECTIONS. PHYSICAL LAYOUTS ARE TO BE PER FIELD CONDITIONS. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.
4. LABEL ALL DISTRIBUTION EQUIPMENT.
5. PROVIDE ARC-FLASH HAZARD WARNING FIELD LABELING TO ELECTRICAL EQUIPMENT IN ACCORDANCE WITH NEC 110.16.
6. ALL EXTERIOR ELECTRICAL EQUIPMENT LOCATION SHALL BE COORDINATED WITH THE LOCAL SERVICE PROVIDER AND SHALL BE PROVIDE WITH A NEMA-3R ENCLOSURE.
7. ALL NEW ELECTRICAL EQUIPMENT SHALL BE UL LISTED OR APPROVED BY CITY RECOGNIZED ELECTRICAL TESTING COMPANY.
8. THE CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS COMBINED SHALL BE SIZED FOR A MAXIMUM OF 5 PERCENT VOLTAGE DROP TOTAL, IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. CALCULATIONS SHALL BE COMPLETED BY THE ELECTRICAL CONTRACTOR BASED ON ACTUAL FIELD INSTALLATIONS AND DISTANCES PRIOR TO ROUGH-IN.

EQUIPMENT SCHEDULE

TAG	EQUIPMENT NAME	QUANTITY	VOLTAGE	PHASE	AMP	KW	TOTAL KW	LOAD TYPE	NEMA CONFIGURATION	CIRCUIT REFERENCE
1	ESPRESSO MACHINE	2	208	1	30.0	6.2	13.4	KITCHEN	NEMA L6-50P, *NOTE1	P2:33,35, P2:32,34
2	COUNTER TOP BLENDER	4	120	1	8.6	1.03	4.13	KITCHEN	E-CONNECTION, *NOTE1	P2:1, P2:2, P2:30, P2:31
3	REDBULL FRIDGE	3	120	1	TBD	TBD	TBD	KITCHEN	TBD	P2:3, P2:4, P3:5
4	COFFEE BREWER	1	240	1	25.0	6.00	6.00	KITCHEN	NEMA 14-30R	P2:22,24
4A	COFFEE GRINDER	1	120	1	11	1.32	1.32	KITCHEN	NEMA 5-15P	P2:21
5	COFFEE GRINDER	2	120	1	6.5	0.78	1.56	KITCHEN	NEMA 5-15	P2:28, P2:29
6	POINT OF SALE/REGISTER	1	120	1	TBD	TBD	TBD	RECEPTACLE	ISOLATED GROUND RECEPTACLE	P1:11
9	UNDER COUNTER REFRIGERATOR (LARGE)	3	120	1	3.0	0.35	1.03	REFRIGERATION	NEMA 5-15	P2:6, P2:7, P2:8
9.1	UNDER COUNTER REFRIGERATOR (SMALL)	3	120	1	2.3	0.26	0.80	REFRIGERATION	NEMA 5-15	P2:19, P2:26, P2:27
11	ICE MACHINE	4	208	1	11.5	2.4	7.2	REFRIGERATION	E-CONNECTION, *NOTE1	P2:9,11, P2:13,15, P2:10,12, P2:18,20
12	HIGH SPEED OVEN	2	208	1	30.0	6.0	12.0	KITCHEN	NEMA 6-30P	P2:14,16, P2:23,25,
14	FREEZER (DOUBLE DOOR)	2	120	1	9.6	1.1	2.2	KITCHEN	NEMA 5-15P	P2:17, P2:36

NOTES:

1. VERIFY NEMA CONFIGURATION WITH THE KITCHEN VENDOR DOCUMENTATION.

PANEL SCHEDULE GENERAL NOTES:

1. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY.
2. VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
3. COORDINATE WITH THE MANUFACTURER OF EQUIPMENT FOR THE WIRE SIZE & RATING OF MOCP BEFORE THE COMMENCEMENT OF WORK.
4. COORDINATE ELECTRICAL REQUIREMENT OF PLUMBING/MECHANICAL EQUIPMENTS WITH RESPECTIVE SYSTEM CONTRACTOR/OWNER/ARCHITECT.
5. VERIFY THE EXACT CIRCUIT, CIRCUIT NUMBER IN FIELD & ADJUST / MODIFY CIRCUITING AS REQUIRED.
6. 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.
7. REFER TO ARCHITECTURAL SHEET FOR KITCHEN EQUIPMENT PLAN & SCHEDULE. VERIFY THE BREAKER, CABLE, ELECTRICAL LOAD AND CONDUIT REQUIREMENT/SIZES/RATINGS FOR ALL KITCHEN EQUIPMENTS/MECHANICAL EQUIPMENTS WITH EQUIPMENT SUPPLIER/MANUFACTURER AND PROVIDE THE ELECTRICAL CONNECTION ACCORDINGLY.

PANEL: P1

VOLTAGE: 120/208 Wye | **MAINS TYPE** MCB | **MOUNTING:** RECESSED
PHASE: 3 | **MAINS RATING:** 200 A | **PANEL LOCATION:** BOH
WIRE: 4 | **BUS:** 225 A | **SUPPLY FROM:** SERVICE DISCONNECT SWITCH

CKT. NO.	TRIP AMP	POLE	CIRCUIT DESCRIPTION	LOAD TYPE	WIRE SIZE	A		B		C		WIRE SIZE	LOAD TYPE	CIRCUIT DESCRIPTION	POLE	TRIP AMP	CKT. NO.
1	20	1	INTERIOR LIGHTING	L	2#12, #12G, 3/4"C	0.57	3.00					3#8,#10G,3/4"C	O	ELECTRICAL WATER HEATER	3	40	2
3	20	1	BUILDING SIGNAGE-1	L	2#12, #12G, 3/4"C			1.50	3.00			--	--	--	--	--	4
5	20	1	BUILDING SIGNAGE-2	L	2#12, #12G, 3/4"C					1.50	3.00	--	--	--	--	--	6
7	20	1	BUILDING SIGNAGE-3	L	2#12, #12G, 3/4"C	1.50	8.05					3#4, #8G, 1"C	H	RTU-1	3	70	8
9	20	1	OUTDOOR RECEPTACLE	R	2#12, #12G, 3/4"C			0.72	8.05			--	--	--	--	--	10
11	20	1	6_POS/REGISTER MAIN CPU	R	2#12, #12G, 3/4"C					0.50	8.05	--	--	--	--	--	12
13	20	1	CONVENIENCE RECEPTACLES	R	2#12, #12G, 3/4"C	0.54	0.00						--	Spare	1	20	14
15	20	1	TIME CLOCK	R	2#12, #12G, 3/4"C			0.18	0.00				--	Spare	1	20	16
17	20	1	DIGITAL MENU BOARD	R	2#12, #12G, 3/4"C					0.54	0.00		--	Spare	1	20	18
19	20	1	ROOF RECEPTACLE	R	2#12, #12G, 3/4"C	0.18	0.00						--	Spare	1	20	20
21	15	1	EF-1	L	2#12, #12G, 3/4"C			0.02	0.00				--	Spare	1	20	22
23	15	1	EF-2	M	2#12, #12G, 3/4"C					0.08	0.00		--	Spare	1	20	24
25	20	1	AC-1 - AIR CURTAIN	M	2#12, #12G, 3/4"C	0.29	0.00						--	Spare	1	20	26
27	20	1	AC-2 - AIR CURTAIN	M	2#12, #12G, 3/4"C			0.29	0.00				--	Spare	1	20	28
29	20	1	AC-3 - AIR CURTAIN	M	2#12, #12G, 3/4"C					0.29	0.00		--	Spare	1	20	30
31	20	1	AC-4 - AIR CURTAIN	M	2#12, #12G, 3/4"C	0.29	0.00						--	Spare	1	20	32
33	20	1	RCP-1	M	2#12, #12G, 3/4"C			0.20	0.00				--	Spare	1	20	34
35	20	1	PROVISION FOR HEAT TRACE	H	2#12, #12G, 3/4"C					0.90	0.00		--	Spare	1	20	36
37	20	1	Spare	--		0.00	0.00						--	Spare	1	20	38
39	20	1	Spare	--				0.00	0.00				--	Spare	1	20	40
41	20	1	Spare	--						0.00	0.00		--	Spare	1	20	42
			TOTAL CONNECTED LOAD (KVA):			**14.41**		**13.96**		**14.86**							
			TOTAL CONNECTED AMPS:			**120.64**		**116.31**		**124.39**							

LOAD TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	L	5090 VA	125.00%	6362 VA
RECEPTACLE	R	2660 VA	100.00%	2660 VA
HVAC	H	25037 VA	100.00%	25037 VA
MOTOR	M	1436 VA	100.00%	1436 VA
KITCHEN/EQUIPMENTS	E	0 VA	0.00%	0 VA
OTHER	O	9000 VA	100.00%	9000 VA

PANEL TOTAL LOAD SUMMARY	
TOTAL CONNECTED LOAD:	43.22 kVA
TOTAL ESTIMATED DEMAND LOAD:	44.50 kVA
TOTAL CONNECTED CURRENT:	119.97 A
TOTAL ESTIMATED DEMAND CURRENT:	123.51 A

NOTES:

PANEL: P2

VOLTAGE: 120/208 Wye | **MAINS TYPE** MCB | **MOUNTING:** RECESSED
PHASE: 3 | **MAINS RATING:** 200 A | **PANEL LOCATION:** BOH
WIRE: 4 | **BUS:** 225 A | **SUPPLY FROM:** SERVICE DISCONNECT SWITCH

CKT. NO.	TRIP AMP	POLE	CIRCUIT DESCRIPTION	LOAD TYPE	WIRE SIZE	A		B		C		WIRE SIZE	LOAD TYPE	CIRCUIT DESCRIPTION	POLE	TRIP AMP	CKT. NO.
1	20	1	2_COUNTER TOP BLENDER	E	2#12, #12G, 3/4"C	1.15	1.15					2#12, #12G, 3/4"C	E	2_COUNTER TOP BLENDER	1	20	2
3	20	1	3_REDBULL FRIDGE	E	2#12, #12G, 3/4"C			0.60	0.60			2#12, #12G, 3/4"C	E	3_REDBULL FRIDGE	1	20	4
5	20	1	3_REDBULL FRIDGE	E	2#12, #12G, 3/4"C					0.60	0.35	2#12, #12G, 3/4"C	E	9_UC REFRIGERATOR LARGE	1	20	6
7	20	1	9_UC REFRIGERATOR LARGE	E	2#12, #12G, 3/4"C	0.35	0.35					2#12, #12G, 3/4"C	E	9_UC REFRIGERATOR LARGE	1	20	8
9	15	2	11_ICE MACHINE	E	2#12, #12G, 3/4"C			0.50	0.50			2#12, #12G, 3/4"C	E	11_ICE MACHINE	2	15	10
11	--	--	--	--	--					0.50	0.50	--	--	--	--	--	12
13	15	2	11_ICE MACHINE	E	2#12, #12G, 3/4"C	0.50	3.10					2#10, #10G, 3/4"C	E	12_HIGH SPEED OVEN	2	30	14
15	--	--	--	--	--			0.50	3.10			--	--	--	--	--	16
17	20	1	14_FREEZER	E	2#12, #12G, 3/4"C					1.32	0.50	2#12, #12G, 3/4"C	E	11_ICE MACHNE	2	15	18
19	20	1	9.1_UC REFRIGERATOR SMALL	E	2#12, #12G, 3/4"C	0.27	0.50					--	--	--	--	--	20
21	20	1	4A_COFFEE GRINDER	E	2#12, #12G, 3/4"C			1.32	2.60			3#10, #10G, 3/4"C	E	4_COFFEE BREWER	2	30	22
23	30	2	12_HIGH SPEED OVEN	E	2#10, #10G, 3/4"C					3.10	2.60	--	--	--	--	--	24
25	--	--	--	--	--	3.10	0.27					2#12, #12G, 3/4"C	E	9.1_UC REFRIGERATOR SMALL	1	20	26
27	20	1	9.1_UC REFRIGERATOR SMALL	E	2#12, #12G, 3/4"C			0.27	1.08			2#12, #12G, 3/4"C	E	5_COFFEE GRINDER	1	20	28
29	20	1	5_COFFEE GRINDER	E	2#12, #12G, 3/4"C					1.08	1.15	2#12, #12G, 3/4"C	E	2_COUNTER TOP BLENDER	1	20	30
31	20	1	2_COUNTER TOP BLENDER	E	2#12, #12G, 3/4"C	1.15	3.35					2#8, #10G, 3/4"C	E	1_ESPRESSO MACHINE	2	50	32
33	50	2	1_ESPRESSO MACHINE	E	2#8, #10G, 3/4"C			3.35	3.35			--	--	--	--	--	34
35	--	--	--	--	--					3.35	1.32	2#12, #12G, 3/4"C	E	14_FREEZER	1	20	36
37	20	1	Spare	--		0.00	0.00						--	Spare	1	20	38
39	20	1	Spare	--				0.00	0.00				--	Spare	1	20	40
41	20	1	Spare	--						0.00	0.00		--	Spare	1	20	42
			TOTAL CONNECTED LOAD (KVA):			**15.23**		**17.77**		**16.37**							
			TOTAL CONNECTED AMPS:			**126.88**		**149.50**		**137.85**							

LOAD TYPE	LOAD CLASSIFICATION	CONNECTED LOAD	DEMAND FACTOR	ESTIMATED DEMAND
LIGHTING	L	0 VA	0.00%	0 VA
RECEPTACLE	R	0 VA	0.00%	0 VA
HVAC	H	0 VA	0.00%	0 VA
MOTOR	M	0 VA	0.00%	0 VA
KITCHEN/EQUIPMENTS	E	49358 VA	65.00%	32083 VA
OTHER	O	0 VA	0.00%	0 VA

PANEL TOTAL LOAD SUMMARY	
TOTAL CONNECTED LOAD:	49.36 kVA
TOTAL ESTIMATED DEMAND LOAD:	32.08 kVA
TOTAL CONNECTED CURRENT:	137.00 A
TOTAL ESTIMATED DEMAND CURRENT:	89.05 A

NOTES:

ELECTRICAL LOAD SUMMARY

DESCRIPTION	CONNECTED KVA	VOLT	PHASE	DEMAND FACTOR	DEMAND KVA
LIGHTING	5.1	277	1	1.25	6.3
RECEPTACLES	2.7	120	1	>10kW=10+[0.5*(kW-10)]	2.7
HVAC	25.0	480	3	1.00	25.0
MOTOR	1.6	120	1	1.00	1.6
KITCHEN EQUIPENTS	49.4	208	3	0.65	32.1
OTHERS/MISCILLANEOUS	9.0	208	1	1.00	9.0
TOTAL	92.7				76.7

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 / SYSTEM VOLTAGE x 1.732 — MINIMUM FEEDER AMPERAGE

76.7	x 1000 =	76,734	213.0 AMPS	USE (NEW) 400AMP SERVICE
208	x 1.732 =	360		

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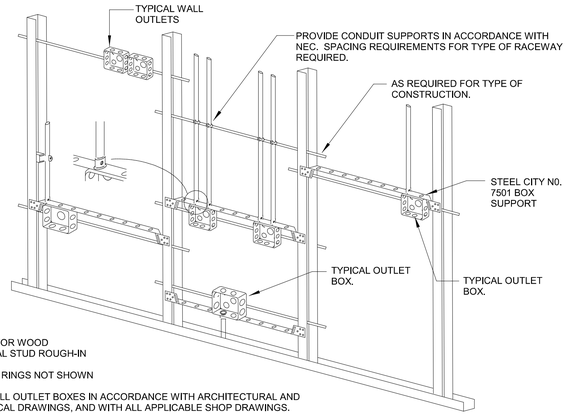
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS
2	2026-01-05	BD COMMENTS - 2

DATE: 09-10-2025
CONTENTS: ELECTRICAL RISER DIAGRAM AND SCHEDULES

E2.0



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

N.T.S

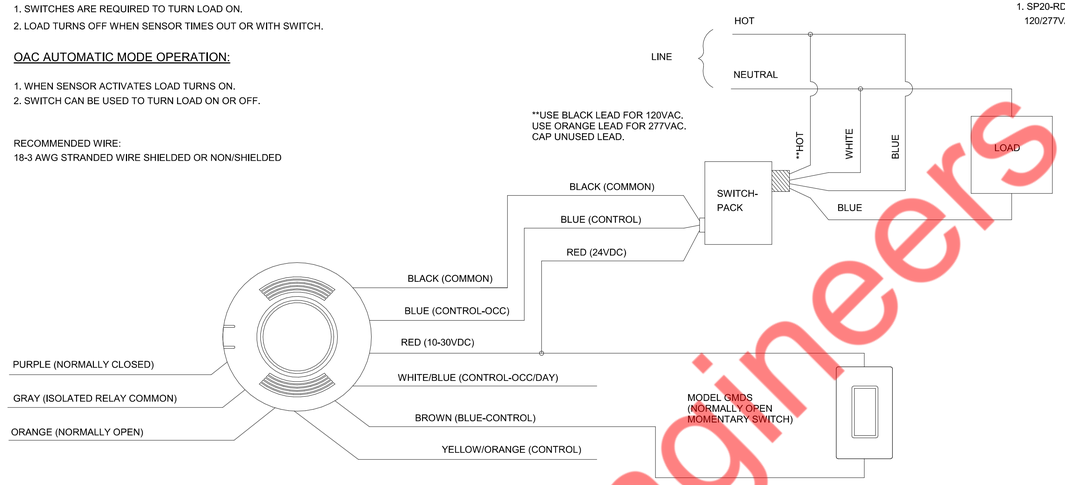
OAC AND VAC MANUAL MODE OPERATION:

1. SWITCHES ARE REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR WITH SWITCH.

OAC AUTOMATIC MODE OPERATION:

1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. SWITCH CAN BE USED TO TURN LOAD ON OR OFF.

RECOMMENDED WIRE:
18-3 AWG STRANDED WIRE SHIELDED OR NON/SHIELDED

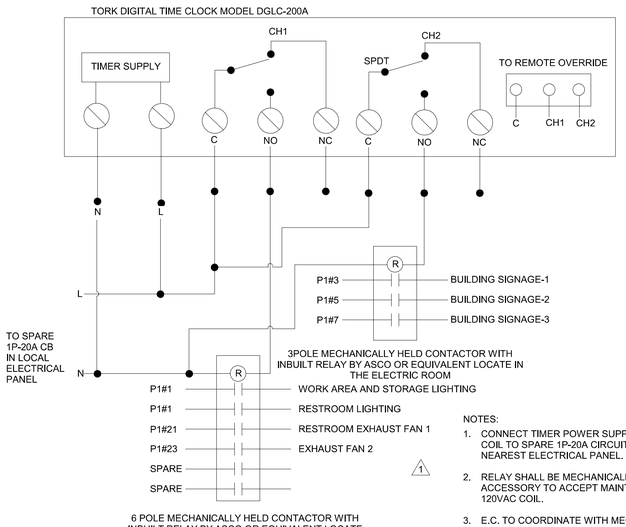


NOTES

1. SP20-RD4 SWITCHPACK SHOWN. 120/277VAC 20AMP RATING.

2 OCCUPANCY - AUTO ON/OFF. WIRING DIAGRAM - LOW VOLTAGE CEILING SENSOR

N.T.S

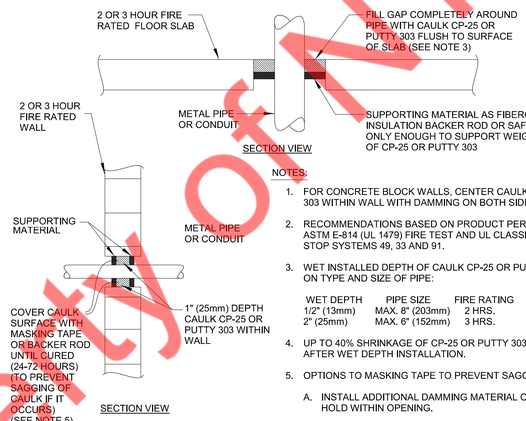


NOTES:

1. CONNECT TIMER POWER SUPPLY AND RELAY COIL TO SPARE 1P-20A CIRCUIT BREAKER IN NEAREST ELECTRICAL PANEL.
2. RELAY SHALL BE MECHANICALLY HELD WITH ACCESSORY TO ACCEPT MAINTAINED ON INPUT, 120VAC COIL.
3. E.C. TO COORDINATE WITH MECHANICAL CONTRACTOR FOR THE EXACT CONTROL OF EXHAUST FAN WITH TIME CLOCK.
4. ABOVE DIAGRAM IS FOR REFERENCE ONLY. FOR EXACT ARRANGEMENT E.C. SHALL COORDINATE WITH EQUIPMENT SUPPLIER/MANUFACTURER OF TIME CLOCK ON FIELD.

3 CONDUIT SUPPORT DETAIL ON ROOF

N.T.S



NOTES:

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

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

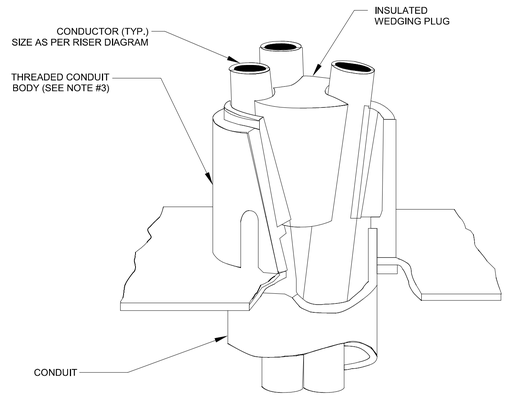
4. UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.
5. OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
   A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
   B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS.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

4 FIRE STOP DETAIL

N.T.S

NOTES:

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



5 VERTICAL CABLE SUPPORT DETAIL

N.T.S

DAILY PERKS

#	DATE	REVISION
	2025-07-02	ISSUE FOR PERMIT
1	2025-12-19	BD COMMENTS
2	2026-01-05	BD COMMENTS - 2

DATE: 09-10-2025
CONTENTS: ELECTRICAL DETAILS

E3.0

COM*check* Software Version COMcheckWeb

Interior Lighting Compliance Certificate

Project Information

Energy Code: 2021 IECC
Project Title: Daily Perks Coffee, ND
Project Type: New Construction

Construction Site:
BISMARCK, North Dakota

Owner/Agent:

Designer/Contractor:
ERIC ENGELL
EMR ENGINEERS
4236 HWY 3630
SUITE 49674
ANNVILLE, Kentucky 40402

Additional Efficiency Package(s)

Credits: 10.0 Required 0.0 Proposed

Allowed Interior Lighting Power

A Area Category	B Floor Area (ft2)	C Allowed Watts / ft2	D Allowed Watts
1-Dining: Cafeteria/Fast Food	605	0.76	460
		Total Allowed Watts =	460

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-Dining: Cafeteria/Fast Food				
LED 1: A: Other:	1	5	50	250
LED 2: B: Other:	1	2	18	37
		Total Proposed Watts =		287

Interior Lighting PASSES: Design 38% 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 2021 IECC requirements in COM*check* Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

ERIC ENGELL
Name - Title

07/02/25
Date

COM*check* Software Version COMcheckWeb

Inspection Checklist

Energy Code: 2021 IECC

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

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

Section # & Req.ID	Plan Review	Complies?	Comments/Assumptions
C103.2 [PR4][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.
C406 [PR9][1]	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	☐Complies ☐Does Not ☐Not Observable ☐Not Applicable	Requirement will be met.

Additional Comments/Assumptions:

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

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

Additional Comments/Assumptions:

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

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

Additional Comments/Assumptions:

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

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

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

DAILY PERKS

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2	2026-01-05	BD COMMENTS - 2

DATE: 09-10-2025
CONTENTS: ENERGY COMPLIANCE

E4.0