MECHANICAL SPECIFICATIONS (DIVISIONS 22 AND 23)

BASIC MECHANICAL REQUIREMENTS
FURNISH LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR COMPLETION OF WORK UNLESS INDICATED OR NOTED OTHERWISE. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH LOCAL AND STATE ORDINANCES AND THE INTERNATIONAL MECHANICAL CODE AND UNIFORM PLUMBING CODE. PUT ALL SYSTEMS INTO FULL OPERATION AND ADJUST TO SPECIFIED CONDITIONS. PAY ALL PERMITS AND FEES LEVIED BY UTILITY COMPANIES AND/OR GOVERNING AGENCIES. ALL PIPING, FITTINGS, VALVES, FIXTURES, FAUCETS AND EQUIPMENT CONTAINING OR CONVEYING POTABLE WATER SHALL COMPLY WITH THE LATEST US SAFE DRINKING WATER ACT MANDATING ANY WETTED SURFACE OF THE ABOVE MENTIONED ITEMS SHALL NOT CONTAIN ABOVE 0.25% LEAD CONTENT BY WEIGHTED AVERAGE. ALL PIPING, FITTINGS, VALVE AND EQUIPMENT CONTAINING OR CONVEYING POTABLE WATER SHALL COMPLY WITH NSF 61 G AND NSF 372 OR SHALL BE PROVIDED WITH INDICATION ON SUBMITTALS THE MANUFACTURER'S DECLARATION OF SELF-CERTIFICATION.
CONFORM TO APPLICABLE CODE FOR ADDITION OF NON-POTABLE CHEMICALS TO BUILDING MECHANICAL SYSTEMS, AND TO PUBLIC SEWAGE SYSTEMS.
DRAWINGS ARE DIAGRAMMATIC. THE CONTRACTOR SHALL VISIT SITE AND COORDINATE INSTALLATION WITH EXISTING CONDITIONS PRIOR TO PROVIDING A BID, SECURING EQUIPMENT AND FABRICATING DUCTWORK AND PIPING.

SUBMITTALS FOR REVIEW
SHOP DRAWINGS, CATALOG INFORMATION AND MATERIAL SCHEDULES SHALL BE SUBMITTED FOR APPROVAL ON ALL SPECIFIED MATERIALS AND EQUIPMENT PRIOR TO ORDERING.

DISINFECTION OF DOMESTIC WATER PIPING SYSTEM
PRIOR TO STARTING WORK, VERIFY SYSTEM IS COMPLETE, FLUSHED AND CLEAN. ENSURE PH OF WATER TO BE TREATED IS BETWEEN 7.4 AND 7.6 BY ADDING ALKALI (CAUSTIC SODA OR SODA ASH) OR ACID (HYDROCHLORIC). INJECT DISINFECTANT, FREE CHLORINE IN LIQUID, POWDER, TABLET OR GAS FORM, THROUGHOUT SYSTEM TO OBTAIN 50 TO 80 MG/L RESIDUAL. BLEED WATER FROM OUTLETS TO ENSURE DISTRIBUTION AND TEST FOR DISINFECTANT RESIDUAL AT MINIMUM 15 % OF OUTLETS. MAINTAIN DISINFECTANT IN SYSTEM FOR TWENTY-FOUR (24) HOURS. IF FINAL DISINFECTANT RESIDUAL TESTS LESS THAN 25 MG/L, REPEAT TREATMENT. FLUSH DISINFECTANT FROM SYSTEM UNTIL RESIDUAL EQUAL TO THAT OF INCOMING WATER OR 1.0 MG/L. TAKE SAMPLES NO SOONER THAN TWENTY-FOUR (24) HOURS AFTER FLUSHING, FROM 10 % OF OUTLETS AND FROM WATER ENTRY, AND ANALYZE IN ACCORDANCE WITH AWWA C651. PROVIDE LABORATORY RESULTS TO OWNER'S REPRESENTATIVE. OBTAIN APPROVAL FROM LOCAL HEALTH DEPARTMENT.

TESTING
SANITARY SEWER & VENT: TEST ALL BUILDING SANITARY SEWER & VENT PIPING TO ENSURE SYSTEM IS WATER TIGHT. A WATER TEST SHALL BE APPLIED TO THE DRAINAGE AND VENT SYSTEMS EITHER IN ITS ENTIRETY OR IN SECTIONS. IF APPLIED TO THE ENTIRE SYSTEM, ALL OPENINGS IN THE PIPING SHALL BE TIGHTLY CLOSED, EXCEPT THE HIGHEST OPENING, AND THE SYSTEM FILLED WITH WATER TO POINT OF OVERFLOW. IF THE SYSTEM IS TESTED IN SECTIONS, EACH OPENING SHALL BE TIGHTLY PLUGGED EXCEPT THE HIGHEST OPENING OF THE SECTION UNDER TEST, AND EACH SECTION SHALL BE FILLED WITH WATER, BUT NO SECTION SHALL BE TESTED WITH LESS THAN A 10 FOOT HEAD OF WATER. IN TESTING SUCCESSIVE SECTIONS, AT LEAST THE UPPER 10 FEET OF THE NEXT PRECEDING SECTION SHALL BE TESTED, SO THAT NO JOINT OR PIPE IN THE BUILDING (EXCEPT THE UPPERMOST 10 FEET OF THE SYSTEM SHALL HAVE BEEN SUBMITTED TO A TEST OF LESS THAN 10 FEET HEAT OF WATER. THE WATER SHALL BE KEPT IN THE SYSTEM, OR IN THE PORTION UNDER TEST, FOR AT LEAST FIFTEEN MINUTES BEFORE INSPECTION STARTS. THE SYSTEM SHALL THEN BE TIGHT AT ALL POINTS. TESTS SHALL BE MADE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
PLUMBING WATER PIPING: UPON COMPLETION OF A SECTION OR OF THE ENTIRE NEW HOT AND COLD WATER SUPPLY SYSTEM, IT SHALL BE TESTED AND PROVED TIGHT UNDER A WATER PRESSURE NOT LESS THAN THE WORKING PRESSURE UNDER WHICH IT IS TO BE USED OR 100 PSIG WHICHEVER IS GREATER. THE WATER USED FOR TESTS SHALL BE OBTAINED FROM A POTABLE SOURCE OF SUPPLY. A FIFTY (50) POUND PER SQUARE INCH AIR PRESSURE MAY BE SUBSTITUTED FOR THE WATER TEST. IN EITHER METHOD OF TEST, THE PIPING SHALL WITHSTAND THE TEST WITHOUT LEAKING FOR A PERIOD OF NOT LESS THAN THIRTY (30) MINUTES. TESTS SHALL BE MADE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
NATURAL GAS PIPING: GAS PIPING SHALL BE TESTED AND MADE TIGHT IN ACCORDANCE WITH THE LATEST EDITION OF THE INTERNATIONAL FUEL GAS CODE AND ANY OTHER GOVERNING LOCAL GAS CODES.

DEMOLITION:
DEMOLITION OF EXISTING MECHANICAL SYSTEMS AND EQUIPMENT IN REMODELED AREAS SHALL BE PROVIDED FOR BY THIS CONTRACTOR. THE CONTRACTOR SHALL REMOVE EQUIPMENT, PIPING, DUCTWORK, ETC. AS INDICATED ON DRAWINGS. CAPPING ALL DUCTWORK, PIPING, ETC. AS INDICATED. ALL REMOVED EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BECOME THE PROPERTY OF THE CONTRACTOR, IF REFUSED BY THE OWNER, AND SHALL BE REMOVED FROM SITE IN AN APPROVED MANNER. EQUIPMENT TO BE REUSED OR TURNED OVER TO THE OWNER SHALL BE FULLY CLEANED, REPAIRED OR REPLACED, IF DAMAGED BY THE CONTRACTOR.

EXISTING UTILITIES AND PIPING:
THE LOCATIONS OF EXISTING CONCEALED LINES AND CONNECTION POINTS HAVE BEEN INDICATED AS CLOSELY AS POSSIBLE FROM AVAILABLE INFORMATION. THE CONTRACTOR SHALL ASSUME THAT SUCH CONNECTION POINTS ARE WITHIN A 10-FOOT (10') RADIUS OF THE INDICATED LOCATION. WHERE CONNECTION POINTS ARE NOT WITHIN THIS RADIUS, THE CONTRACTOR SHALL CONTACT THE ARCHITECT FOR A DECISION BEFORE PROCEEDING OR MAY PROCEED AT HIS OWN EXPENSE.

RECORD DRAWINGS
RECORD DIFFERENCES BETWEEN INSTALLED WORK AND CONTRACT DOCUMENTS ON A SET MARKED UP TO BE FURNISHED TO THE OWNER'S REPRESENTATIVE.

PROJECT FINALIZATION
PROVIDE OPERATION AND MAINTENANCE MANUALS, TEST & BALANCE REPORTS, OWNER INSTRUCTION ON TRAINING AND MAINTENANCE, RECORD DRAWINGS, AND SYSTEM/EQUIPMENT GUARANTEES.

TESTING, ADJUSTING, AND BALANCING
AIR AND WATER DISTRIBUTION SYSTEMS SHALL BE BALANCED TO FLOW RATES AND CONDITIONS SPECIFIED AND INDICATED ON THE DRAWINGS (AND IN ACCORDANCE WITH THE STATE ENERGY CODE) BY AN AABC OR NEBB CERTIFIED BALANCING AGENCY. TOLERANCE: +/-10%. APPROVED AGENCIES: TESTCOMM LLC OR APPROVED EQUAL.

OPERATING AND MAINTENANCE INSTRUCTIONS:
CONTRACTOR SHALL INSTRUCT THE OWNER OF THE PROPER OPERATION OF EQUIPMENT FURNISHED BY THIS CONTRACTOR AND SHALL PREPARE MANUALS DESCRIBING THE SERVICING AND MAINTENANCE REQUIREMENTS FOR ALL MECHANICAL EQUIPMENT. PROVIDE RECORD OF PIPE AND TESTS IN ACCORDANCE. INCLUDE CERTIFICATE OF TESTS IN O&M MANUAL. INCLUDE CERTIFICATE OF HEALTH DEPARTMENT APPROVAL OF DOMESTIC WATER QUALITY IN O&M MANUAL.

SEISMIC
SEISMIC SUPPORTS ARE REQUIRED FOR THE PLUMBING AND HVAC SYSTEMS IN THE PROJECT. SEISMIC CONDITIONS: SEISMIC DESIGN CATEGORY D, MECHANICAL SYSTEM IMPORTANCE FACTOR FOR NATURAL GAS PIPING AND GAS FIRED EQUIPMENT, IP=1.5, MECHANICAL IMPORTANCE FACTOR FOR ALL OTHER PLUMBING AND HVAC SYSTEMS: IP=1.0.
SEISMIC BRACING SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH ASCE 7-16. THE MANUFACTURER PROVIDING THE SEISMIC BRACING SHALL PROVIDE STAMPED ENGINEERED DRAWINGS INDICATING CONFORMANCE WITH THE REQUIREMENTS OF ASCE 7-16 FOR THE SDC AND IP INDICATED ABOVE.
APPROVED SEISMIC MANUFACTURERS: VIBRO-ACOUSTICS, AMBER BOOTH, ISAT, KINETICS, KORFUND, AND MASON INDUSTRIES.
AFTER INSTALLATION, ARRANGE AND PAY FOR THE SEISMIC RESTRAINT PRODUCT MANUFACTURER, OR REPRESENTATIVE, TO VISIT THE SITE TO VERIFY THAT THE SEISMIC AND WIND RESTRAINT SYSTEMS ARE INSTALLED PROPERLY, AND SUBMIT A CERTIFICATE SO STATING.

CUT AND PATCH
ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF MECHANICAL SYSTEMS AND EQUIPMENT SHALL BE THE RESPONSIBILITY OF THIS CONTRACTOR. NO CUTTING OF STRUCTURAL MEMBERS SHALL BE ALLOWED WITHOUT STRUCTURAL ENGINEERS APPROVAL. PATCHING PROVIDED BY THIS CONTRACTOR SHALL BE COMPLETE IN EVERY DETAIL AND SHALL MEET THE APPROVAL OF THE ARCHITECT.

EQUIPMENT
INSTALL IN COMPLETE ACCORDANCE WITH MANUFACTURER REQUIREMENTS.

MECHANICAL IDENTIFICATION
IDENTIFY ALL SCHEDULED EQUIPMENT WITH PLASTIC NAMEPLATES AND CONTROL PANELS (LAMINATED THREE-LAYER PLASTIC WITH ENGRAVED WHITE LETTERS ON BLACK BACKGROUND). SMALL DEVICES, SUCH AS IN-LINE PUMPS, MAY BE IDENTIFIED WITH TAGS.
IDENTIFY PIPING, CONCEALED OR EXPOSED, WITH PLASTIC PIPE MARKERS OR PLASTIC TAPE PIPE MARKERS. IDENTIFY SERVICE, FLOW DIRECTION, AND PRESSURE (WHEN APPLICABLE). INSTALL IN CLEAR VIEW AND ALIGN WITH AXIS OF PIPING. LOCATE IDENTIFICATION NOT TO EXCEED 20 FEET (BUT NOT LESS THAN ONE PER ROOM) ON STRAIGHT RUNS INCLUDING RISERS AND DROPS, ADJACENT TO EACH VALVE AND TEE, AT EACH SIDE OF PENETRATION OF STRUCTURE OR ENCLOSURE, AND AT EACH OBSTRUCTION.

SLEEVES/SEALS.
WHERE PIPING AND DUCTWORK PENETRATES A ROOF, FLOOR OR WALL, CLOSE OFF SPACE BETWEEN PIPE AND SLEEVE WITH 3 LB. FIBERGLASS INSULATION AND ELASTOMERIC FIRE RATED SEALANT (AIR TIGHT). THIS APPLIES TO ALL ROOFS, WALLS OR FLOORS REGARDLESS OF FIRE RATING. NOTE: 3 LB. INSULATION NOT REQUIRED AT ROOF PENETRATIONS. USE FIRE SAFEING SEALANT AT PENETRATIONS OF FIRE RATED FLOORS AND WALLS. PROVIDE CHROME PLATED CAST BRASS, ONE PIECE ESCUTCHEONS AT ALL PIPE PENETRATIONS OF FINISHED SURFACES (WALLS, CEILINGS, FLOORS).

ACCESS DOORS
PROVIDE ACCESS DOORS IN WALL/SHAFT SURFACES AND DUCTWORK AS REQUIRED TO ALLOW FOR SERVICE TO EQUIPMENT SUCH AS VALVES, ACTUATORS, FIRE DAMPERS, FANS, PUMPS ETC.

DUCTWORK
SUPPLY & RETURN LOW PRESSURE SHEET METAL DUCTWORK SHALL BE GALVANIZED STEEL CONSTRUCTED IN STRICT ACCORDANCE WITH THE LATEST EDITION OF SMACNA STANDARDS FOR HVAC DUCT CONSTRUCTION AND WITH THE INTERNATIONAL MECHANICAL CODE UNLESS INDICATED OTHERWISE. UNLESS NOTED OTHERWISE. DUCTWORK SHALL BE LOW PRESSURE AND CONSTRUCTED TO 2" POSITIVE PRESSURE CLASS FOR SUPPLY AND RELIEF DUCTWORK AND 2" NEGATIVE PRESSURE CLASS FOR OUTSIDE AIR AND RETURN DUCTWORK.
STAINLESS STEEL DUCTS AND CHEMICAL FUME HOOD EXHAUST DUCTWORK: ASTM A167, TYPE 304. 316.
FABRICATE AND SUPPORT IN ACCORDANCE WITH SMACNA, HVAC DUCT CONSTRUCTION STANDARD, METAL AND FLEXIBLE AND THE UNIFORM MECHANICAL CODE. PROVIDE DUCT MATERIAL, GAUGES, REINFORCING, AND SEALING FOR OPERATING PRESSURES INDICATED.
ALL DUCTWORK BETWEEN THE CHEMICAL FUME HOODS AND THE BUILDING DISCHARGE SHALL BE STAINLESS STEEL. MINIMUM GAUGE SHALL BE 18 GAUGE AND DUCTWORK SHALL HAVE LONGITUDINAL SEAMS IN LIEU OF SPIRAL SEAMS.

FLEXIBLE DUCTWORK: THERMAFLEX, MODEL G-KM OR EQUAL. UL 181 CLASS 1 FLEXIBLE AIR DUCT COMPLYING WITH NFPA STANDARD 90A; FACTORY FABRICATED ASSEMBLY COMPOSED OF AN INNER LINER, COATED WOUND SPRING STEEL WIRE, 1 INCH THICK FIBERGLASS INSULATION (INSTALLED R-VALUE 4.3), AND A VAPOR BARRIER OUTER JACKET; 6 INCHES WG POSITIVE WORKING PRESSURE AND 1 INCH WG NEGATIVE WORKING PRESSURE FOR DUCTS UP TO 10 INCH DIAMETER, 4 INCHES WG POSITIVE WORKING PRESSURE AND 1 INCH WG NEGATIVE WORKING PRESSURE FOR DUCTS 12 TO 16 INCHES DIAMETER; 4000 FPM MAXIMUM WORKING VELOCITY; 20 TO 200 °F WORKING TEMPERATURES. FLEXIBLE DUCTS NOT EXCEEDING SIX (6) FEET IN LENGTH MAY BE USED TO CONNECT GRILLES AND DIFFUSERS WHERE DUCTWORK IS NOT EXPOSED. NOTE: REFER TO APPLICABLE DETAILS FOR GRD (GRILLE, REGISTER, DIFFUSERS) CONNECTIONS.

DUCT SEALANT
SEALANT CLASS A: HARDCAST, DURADYNE, DUCTMATE, OR APPROVED EQUAL. NON-HARDENING, WATER RESISTANT, FIRE RESISTIVE, COMPATIBLE WITH MATING MATERIALS. SEALANT SHALL BE COMPOSITELY TESTED FOR FIRE AND SMOKE HAZARD RATINGS ACCORDING TO RECOGNIZED STANDARD TESTING METHODS (ASTM E84) AND SHALL HAVE RATINGS NOT EXCEEDING FLAME SPREAD 25, FUEL CONTRIBUTED 50 AND SMOKE DEVELOPED 50.S SEALANTS USED ON ALL NON-EXTERIOR DUCTWORK SHALL BE WATER BASED (NO SOLVENTS).

DUCT INSULATION
GLASS FIBER, FLEXIBLE BLANKET (DUCT WRAP): MANUFACTURERS: JOHNS MANVILLE, R-SERIES MICROLITE, CERTAINTEED; STANDARD DUCTWRAP, KNAUF; DUCTWRAP, OWENS CORNING; ALL SERVICE DUCTWRAP OR EQUAL. INSULATION: ASTM C553; FLEXIBLE, NONCOMBUSTIBLE BLANKET; K FACTOR: ASTM C518, 0.29BTU IN/(H·SQFT·°F) AT 75 °F; MAXIMUM SERVICE TEMPERATURE: 250 °F; MAXIMUM MOISTURE ABSORPTION: 0.20 % BY VOLUME; DENSITY: 0.75 POUNDS/FOOT³; RESISTANCE TO MICROBIAL GROWTH: ASTM C665; SHALL NOT SUPPORT MOLD, BACTERIA, OR FUNGUS GROWTH. VAPOR BARRIER JACKET: FOIL SCRIM KRAFT (FSK); FOIL THICKNESS: 0.00035 INCHES; MOISTURE VAPOR TRANSMISSION: ASTM E96; 0.02 PERM; CLASS I VINYL; VINYL THICKNESS: 0.0032 INCHES; MOISTURE VAPOR TRANSMISSION: ASTM E96; 1.3 PERM; VAPOR BARRIER TAPE: SAME MATERIAL AS VAPOR BARRIER JACKET AS RECOMMENDED BY THE INSULATION MANUFACTURER.
EXTERIOR APPLICATIONS FOR INSULATED DUCTWORK: ALUMINUM JACKET, ASTM B209; THICKNESS: MINIMUM 0.016 INCH THICK SHEET; LONGITUDINAL SLIP JOINTS AND MINIMUM 2 INCH LAPS; METAL JACKET BANDS: MINIMUM 3/8 INCH WIDE; MINIMUM 0.015 INCH THICK ALUMINUM.
ATTIC SUPPLY & RETURN DUCT WRAP INSULATION SHALL BE 2" THICK. (R-6)
EXTERIOR SUPPLY & RETURN DUCTS INSULATION SHALL BE 4.5" THICK (R-12)

DUCT ACCESSORIES
MANUAL VOLUME DAMPERS SHALL BE OPPOSED BLADE OR SINGLE BLADE AS INDICATED ON THE DRAWINGS AND SHALL BE COMPLETE WITH EXTERNAL LOCKING QUADRANTS. OPPOSED BLADE DAMPERS SHALL BE RUSKIN OR APPROVED EQUAL. AIR TURNING VANES SHALL BE FABRICATED FOR ALL RECTANGULAR ELBOWS IN ACCORDANCE WITH SMACNA HVAC DUCT CONSTRUCTIONS STANDARDS. PROVIDE BALANCE DAMPERS IN BRANCH DUCTWORK TO ALL AIR INLETS AND OUTLETS WHETHER INDICATED ON THE DRAWINGS OR NOT.

REFRIGERANT PIPING
FURNISH AND INSTALL COMPLETE REFRIGERANT PIPING SYSTEMS. PIPE: NITROGENIZED TYPE ACR HARD DRAWN OR ANNEALED, ASTM B280 AND ANSI B9.1 HARD DRAWN (AND BRAZED) OR ANNEALED. SINGLE ZONE SYSTEMS LESS THAN 2 TONS MAY UTILIZE ANNEALED PIPING.

PLUMBING FIXTURES AND EQUIPMENT:
ALL FIXTURES AND RELATED EQUIPMENT SHALL BE EQUAL TO ITEMS SCHEDULED ON THE PLANS. ALL EQUIPMENT SHALL BE NEW AND OF THE LATEST AND MOST CURRENT LINE OF THE SPECIFIED MODEL.

DOMESTIC HOT AND COLD WATER PIPING-ABOVE GROUND:
SHALL BE TYPE "K" OR "L" COPPER CONFORMING TO ASTM-B88 WITH ASME B16.22 WROUGHT COPPER AND BRONZE FITTINGS USING 95/5 NO LEAD SWEAT FITTINGS.

LAB ACID RESISTANCE WASTE & VENT ABOVE GRADE (EXCEPT RETURN AIR PLENUMS)
CPVC PIPE: SPEARS LAB WASTE PIPING, ASTM F 2618
FITTINGS: CPVC
JOINTS: ASTM D 3311, SOLVENT WELD WITH ASTM F 493 SOLVENT CEMENT

PROCESSED WATER SYSTEMS FOR LABORATORY FACILITIES
PIPE & FITTINGS: HIGH PURITY POLYPROPYLENE. PVDF (IN AIR PLENUMS) OR SCHEDULE 80 LOW EXTRACTION PVC, SPEARS, GEORG FISCHER, GSR, PPS, RYAN HERCO, ASAHI OR APPROVED EQUAL. FITTINGS TO INCLUDE FUSION COILS, BUTT OR SOCKET WELD. ALL JOINTS TO BE FUSION WELD TYPE FOR HIGH PURITY POLYPROPYLENE & PVDF OR SOLVENT CEMENT TYPE FOR LOW EXTRACTION PVC. TOTAL SYSTEM RATED AT 150 PSI AT 73°F CAPABLE OF HANDLING TEMPERATURES OF 212°F.
BALL VALVES: HIGH PURITY POLYPROPYLENE, FUSION WELD JOINTS, OR LOW EXTRACTION PVC. PROVIDE UNIONS FOR SERVICING.

NATURAL GAS PIPING:
FURNISH AND INSTALL COMPLETE GAS PIPING SYSTEMS. PIPE: BLACK STEEL SCHEDULE 40, TYPE E OR S, GRADE B, SEAMLESS BELVELED ENDS. FITTINGS: MALLEABLE IRON, ASME B16.3. JOINTS: NFPA 54, THREADED, ANSI B31.2.

PIPE HANGERS:
PIPE HANGERS SHALL BE GRINNELL, FEE AND MASON OR APPROVED EQUAL. INSTALL PIPING SO AS NOT TO INTERFERE WITH ANY OTHER BUILDING COMPONENTS OR MECHANICAL/ELECTRICAL SYSTEMS. PROVIDE WITH SUITABLE INSULATION SADDLES OR SHIELDS. HOT PIPING OVER 2" SHALL UTILIZE CAST IRON ROLLERS AND CURVED CARBON STEEL PLATE EQUAL TO ANVIL FIG 160, 161, 162. COLD PIPING SHALL HAVE CONTINUOUS INSULATION WITH NO THERMAL BREAKS. PIPE HANGERS IN CONTACT WITH COPPER OR BRASS PIPE SHALL BE MADE OF THE SAME MATERIAL AS THE PIPE.

ABOVE GRADE SANITARY WASTE AND VENT PIPING:
WASTE PIPING SHALL BE SERVICE WEIGHT CAST IRON WITH HEAVY DUTY NO-HUB FITTINGS UTILIZING 4-BAND STAINLESS STEEL AND NEOPRENE GASKETS. VENT PIPING SHALL BE SCHEDULE 40 CAST IRON WITH NO-HUB FITTINGS OR SOLID CORE SCHEDULE 40 PVC (DWV). PENETRATIONS OF PLASTIC PIPING THRU RATED WALLS, FLOORS OR CEILINGS SHALL BE INSTALLED PER REQUIREMENTS OF LOCAL AUTHORITY HAVING JURISDICTION.

INDIRECT WASTE PIPING:
SHALL BE TYPE "L" COPPER (OR PVC) CONFORMING TO ASTM B88 WITH ASME B16.22 WROUGHT COPPER AND BRONZE FITTINGS USING 95/5 NO LEAD SWEAT FITTINGS.

PLUMBING SPECIALTIES:
BALL VALVES: CLASS 150, 400 PSI, BRONZE TWO PIECE BODE, CHROME PLATED BRASS BALL, REGULAR PORT, TEFLON SEATS AND STUFFING BOX RING, BLOW-OUT PROOF STEM, LEVER HANDLE, SOLDER OR THREADED ENDS WITH UNION.
GAS STOPS UP TO 2", BUTTERFLY (BUTTERBALL) BRONZE BODY, LEVER HANDLE, STAINLESS STEEL DISC AND STEM, VITON SEAL, 200 PSI WORKING PRESSURE, MSS SP-67, AGA CERTIFIED AND UL LISTED FOR GAS SERVICE.
CHECK VALVES, UP TO 2": CLASS 125, BRONZE BODY AND CAP, BRONZE SWING DISC WITH RUBBER SEAT, SOLDER ENDS
STRAINERS, UP TO 2": THREADED BRASS BODY FOR 125 PSI, AT 400 °F, Y PATTERN WITH 3/64 INCH STAINLESS STEEL PERFORATED SCREEN
PROVIDE WATER HAMMER ARRESTORS AT ALL QUICK CLOSING VALVES (FLUSH VALVES) AND AT EACH PLUMBING FIXTURE OR BATTERY OF FIXTURES (DRINKING FOUNTAINS EXCLUDED). AIR CHAMBERS ARE NOT ALLOWED.

PIPING INSULATION
INSULATE HYDRONIC AND PLUMBING PIPING SYSTEMS INCLUDING PIPE FITTINGS AND VALVES. INSULATION SHALL BE GLASS FIBER WITH ALL SERVICE VAPOR BARRIER JACKET AND SHALL BE GREENGUARD CERTIFIED.
SCHULLER, KNAUF, OWENS CORNING. FITTINGS SHALL BE PROTECTED WITH ONE PIECE PVC COVERS EQUAL TO ZESTON 2000.
INSULATE REFRIGERANT PIPING SYSTEMS INCLUDING PIPE FITTINGS AND VALVES. INSULATION SHALL BE CELLULAR FOAM EQUAL TO ARMSTRONG ARMAFLEX-AP. MAKE CONNECTIONS WITH WATERPROOF VAPOR BARRIER CONTACT ADHESIVE COMPATIBLE WITH THE INSULATION-ARMSTRONG 520 ADHESIVE OR APPROVED EQUAL. PAINT EXTERIOR EXPOSED INSULATION WITH TWO COATS OF GRAY FINISH RECOMMENDED BY THE INSULATION MANUFACTURER TO PROTECT FROM WEATHER AND SUNLIGHT.
DOMESTIC COLD WATER: UNDER 1" DIAMETER = 1/2" THICK. 1" DIAMETER AND GREATER = 1" THICK.
DOMESTIC HOT WATER SUPPLY & RETURN: UNDER 1-1/2" DIAMETER = 1" THICK. 1-1/2" DIAMETER AND GREATER = 1-1/2" THICK.
REFRIGERANT PIPING (40 TO 60 DEGREES): UNDER 1 ½" DIAMETER, 1" THICK. 1 ½" DIAMETER AND GREATER: 1 ½" THICK.

VIBRATION ISOLATION
THE NEW ROOFTOP SHALL BE INSTALLED ON SPRING ISOLATED BRACE SIMILAR TO EXISTING.
ALL FANS SHALL BE CONNECTED TO DUCTWORK WITH FLEXIBLE DUCT CONNECTORS.

LAB AND MEDICAL PIPING LEGEND

CF	CARBON FILTERED WATER
CO2	CARBON DIOXIDE
DI	DEIONIZED WATER
DW	DISTILLED WATER
LCA	LAB COMPRESSED AIR
ARV	LAB VENT (ACID RESISTANT VENT)
ARW	LAB WASTE (ACID RESISTANT WASTE)
MA	MEDICAL AIR
MV	MEDICAL VACUUM
N2	NITROGEN
N2O	NITROUS OXIDE
NPCW	NON-POTABLE COLD WATER
NPHW	NON-POTABLE HOT WATER
NPHWR	NON-POTABLE HOT WATER RETURN
NPSCW	NON-POTABLE SOFT COLD WATER
O2	OXYGEN
PWS	PURE WATER SUPPLY
PWR	PURE WATER RETURN
RO	REVERSE OSMOSIS
VAC	VACUUM

HYDRONIC PIPING LEGEND

CD	CONDENSATE DRAIN
RG	REFRIGERANT GAS
RL	REFRIGERANT LIQUID

PLUMBING/PIPING LEGEND

	DOMESTIC COLD WATER (CW)
	DOMESTIC HOT WATER (HW)
	DOMESTIC RECIRCULATED WATER (HWR)
DSP	DRY STAND PIPE
F	FIRE
FDC	FIRE DEPARTMENT CONNECTION PIPE
IW	INDIRECT WASTE (ABOVE FLOOR)
G	NATURAL GAS (7" WC, UNLESS OTHERWISE NOTED)
ODL	OVERFLOW DRAIN LINE
RDL	ROOF DRAIN LINE
SD	STORM DRAIN
SS	SANITARY SEWER
SHR	SOLAR HEATING RETURN
SHS	SOLAR HEATING SUPPLY
	VENT
	WASTE
	VENT (BELOW GRADE)
	WASTE (BELOW GRADE)

TEMPERATURE CONTROL SYMBOLS

- AIRFLOW MONITOR
- AVERAGING SENSOR
- CARBON DIOXIDE SENSOR
- CARBON MONOXIDE SENSOR
- COIL (HEATING/COOLING)
- CONTROL POINT
- CURRENT TRANSDUCER
- DAMPER MOTOR ACTUATOR IDENTIFICATION
- DIFFERENTIAL PRESSURE SWITCH
- DUCT SMOKE DETECTOR
- END SWITCH
- EQUIPMENT IDENTIFICATION
- FILTER
- FLOW SWITCH
- HUMIDITY SENSOR
- IN-LINE DEVICE
- INTERFACE RELAY
- LIGHT (PILOT OR ANNUNCIATOR)
- LIGHT WITH AUDIO ANNUNCIATION
- LOW LIMIT FREEZESTAT
- MOTOR STARTER
- MOTOR STARTER WITH CURRENT SENSING RELAY
- MOTORIZED DAMPER
- OCCUPANCY SENSOR
- POINT SENSOR
- PRESSURE SENSOR
- PUMP
- REFRIGERANT MONITOR
- SENSOR
- SOLENOID VALVE ACTUATOR
- STATIC PRESSURE SENSOR
- SWITCH
- SWITCH WITH GUARDED COVER
- SWITCH WITH PILOT LIGHT
- TEMPERATURE TRANSMITTER
- TEMPERATURE TRANSMITTER WITH SUN SHIELD
- THERMOSTAT
- THERMOSTAT & CO2
- THERMOSTAT AND HUMIDITY SENSOR
- THERMOSTAT, CO2 AND HUMIDITY SENSOR
- THERMOWELL
- VALVE MOTOR ACTUATOR IDENTIFICATION
- WATERFLOW METER
- 2-WAY MODULATING VALVE
- 3-WAY MODULATING VALVE
- 2-OR 3-WAY MODULATING VALVE (SEE PLANS OR DETAILS FOR REQUIREMENTS)

PIPING SYMBOLS

- VALVE - 2-WAY CONTROL
- VALVE - 3-WAY CONTROL
- VALVE - GLOBE/THROTTLING
- VALVE - SOLENOID
- VALVE - SHUTOFF
- AIR SEPARATOR
- ANGLE VALVE
- AUTOMATIC AIR VENT
- CAP
- CHECK VALVE
- CIRCUIT SETTER
- CIRCULATING PUMP
- CLEAN-OUT (BELOW FLOOR OR GRADE)
- CLEAN-OUT (FLUSH TO FLOOR OR GRADE)
- CROSS
- REDUCER
- ELBOW
- ELBOW DOWN
- ELBOW UP
- EXPANSION JOINT
- FIRE DEPARTMENT CONNECTION
- FLEXIBLE CONNECTION
- FLOOR DRAIN (ROUND OR SQUARE)
- FLOOR SINK
- FLOW DIRECTION
- FLOW DIRECTION AND SLOPE
- FLOW SWITCH
- GAUGE COCK
- HOSE BIBB/WALL HYDRANT
- MANHOLE/DRYWELL
- MANUAL AIR VENT
- PENETRATION (FLOOR OR WALL)
- PIPE ANCHOR
- PIPE CONTINUES ALTHOUGH NOT DRAWN
- PIPE GUIDE
- PIPE SLEEVE
- P-TRAP
- PRESSURE GAUGE
- PRESSURE SWITCH
- PRESSURE AND TEMPERATURE RELIEF VALVE
- PRESSURE INDEPENDENT BALANCING VALVE
- PRESSURE SWITCH
- GAS & WATER PRESSURE REDUCING VALVE (POINTS TOWARDS LOW PRESSURE)
- ROOF DRAIN
- SANITARY CROSS
- SANITARY ELBOW
- SANITARY TEE
- SANITARY TEE IN RISER
- SHOWER HEAD
- SIGHT GLASS
- STRAINER
- TEE
- TEE DOWN
- TEE DOWN TO ELBOW
- TEE UP
- TEE UP TO ELBOW
- TEE UP TO RISE
- THERMOMETER
- THERMOWELL
- THRUST RESTRAINT
- UNION/FLANGE/COUPLING
- VALVE IN RISER
- VALVE WITH TAMPER SWITCH
- VENTURI
- VENT THRU ROOF
- WATER HAMMER ARRESTER
- WYE

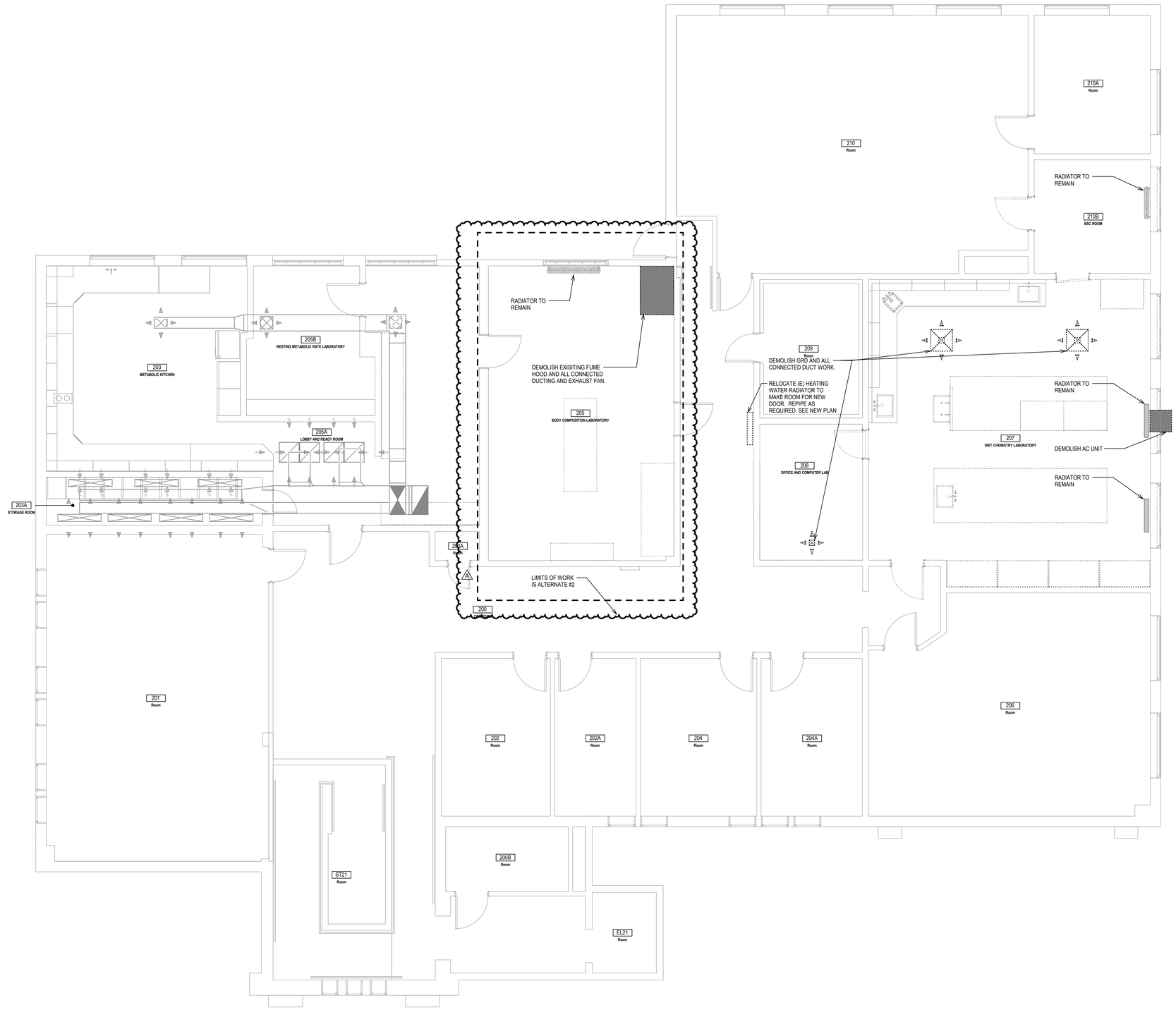
HVAC SYMBOLS

- RECTANGULAR SUPPLY DUCT (SECTION)
- RECTANGULAR RETURN DUCT (SECTION)
- RECTANGULAR EXHAUST DUCT (SECTION)
- RECTANGULAR OSA DUCT (SECTION)
- ROUND SUPPLY DUCT (SECTION)
- ROUND RETURN DUCT (SECTION)
- ROUND EXHAUST DUCT (SECTION)
- ROUND OSA DUCT (SECTION)
- FLAT OVAL SUPPLY DUCT (SECTION)
- DUCTWORK WITH INTERNAL LINING
- ALUMINUM/STAINLESS STEEL DUCTWORK (AS SPECIFIED)
- AIR TRANSFER DUCT SLEEVE
- FLEXIBLE DUCT
- DUCT OFFSET AND DIRECTION (UP / DN)
- ROUND/OVAL MITERED ELL W/ TURNING VANES
- TURNING VANES
- AIR SPLIT TAKEOFF
- BALANCE/VOLUME DAMPER (SEE SPECS FOR TYPE)
- BALANCE/VOLUME DAMPER (SEE SPECS FOR TYPE)
- MOTORIZED CONTROL DAMPER
- FIRE/SMOKE DAMPER
- 12"x12" RECTANGULAR DUCT SIZE (WIDTHxDEPTH)
- 12"ø CIRCULAR DUCT DIAMETER
- 12"/12" FLAT OVAL DUCT SIZE (WIDTH/DEPTH)
- GRD TYPE
- GRILLE/REGISTER/DIFFUSER INFORMATION (TAG, SIZE, CFM)
- AIR FLOW RATE (CFM)
- SIZE
- THERMOSTAT
- SUPPLY AIR FLOW
- RETURN AIR FLOW
- FIRE/SMOKE DAMPER TYPE
- SECURITY GRILLE TYPE
- DAMPER MOTOR OPERATOR
- ATTENUATOR
- TERMINAL BOX, HEAT PUMP, OR FAN COIL UNIT
- DUCT SECURITY GRILLE
- RECTANGULAR SUPPLY DIFFUSER (ARROWS INDICATE THROW)
- RECTANGULAR RETURN REGISTER/GRILLE
- RECTANGULAR EXHAUST REGISTER/GRILLE/HOOD
- LINEAR DIFFUSER (ARROWS INDICATE THROW)
- CIRCULAR DIFFUSER (ARROWS INDICATE THROW)
- SIDEWALL DIFFUSER (ARROWS INDICATE THROW)
- LOUVER (ARROWS INDICATE THROW)
- UNIT HEATER

SYMBOLS & ABBREVIATIONS

GENERAL SYMBOLS

- KEY NOTE
- EQUIPMENT IDENTIFIER
- DETAIL NUMBER / DETAIL REFERENCE / SHEET NUMBER



LEVEL 2 - DEMOLITION PLAN - MECHANICAL

N 1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO 17161 JACOB DEBRINO

TITLE: DEMO FLOOR PLAN - MECHANICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE. MOSCOW, ID 83844

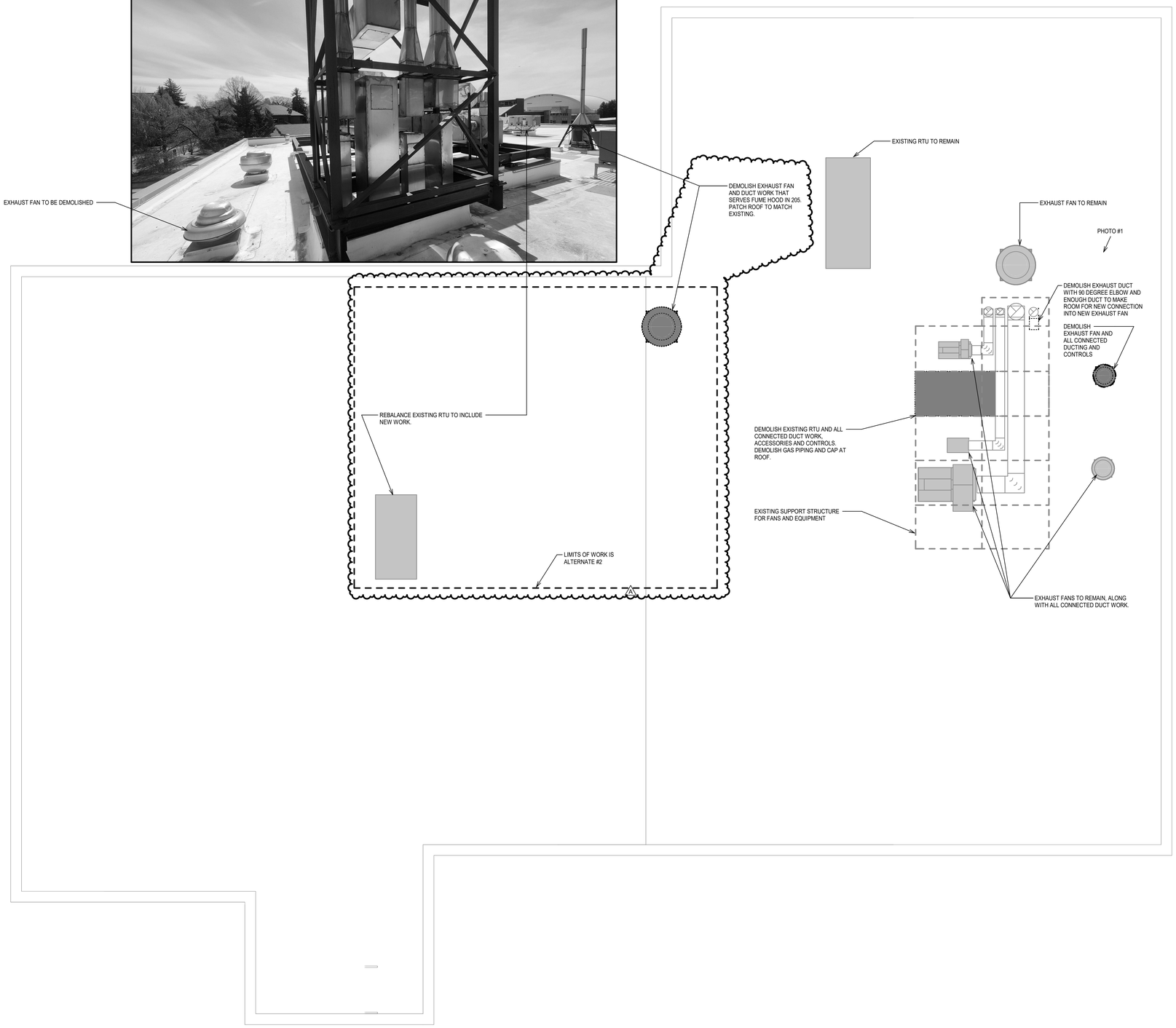
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

MD2-11

PHOTO #1

EXHAUST FAN TO BE DEMOLISHED



DEMO ROOF PLAN - MECHANICAL

1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.3029
mwengineers.com

ISSUE DATE: **07.21.2025**

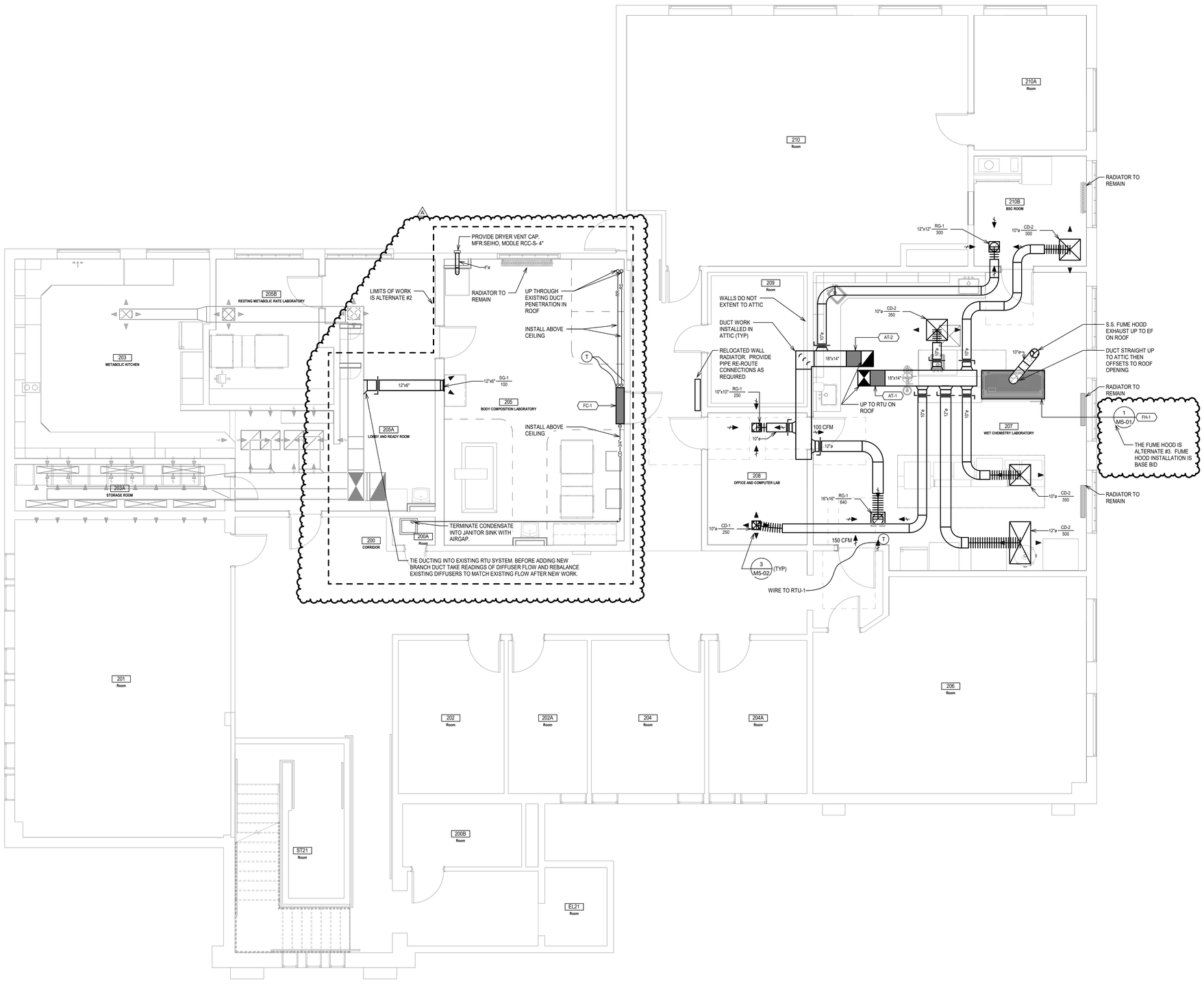
REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO 17161 JACOB DEERING

TITLE: DEMO ROOF PLAN - MECHANICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

MD2-12



LEVEL 2 - MECHANICAL

1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1100
Spokane, WA 99201, USA
509.838.1602
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JACOB DEERING 17161

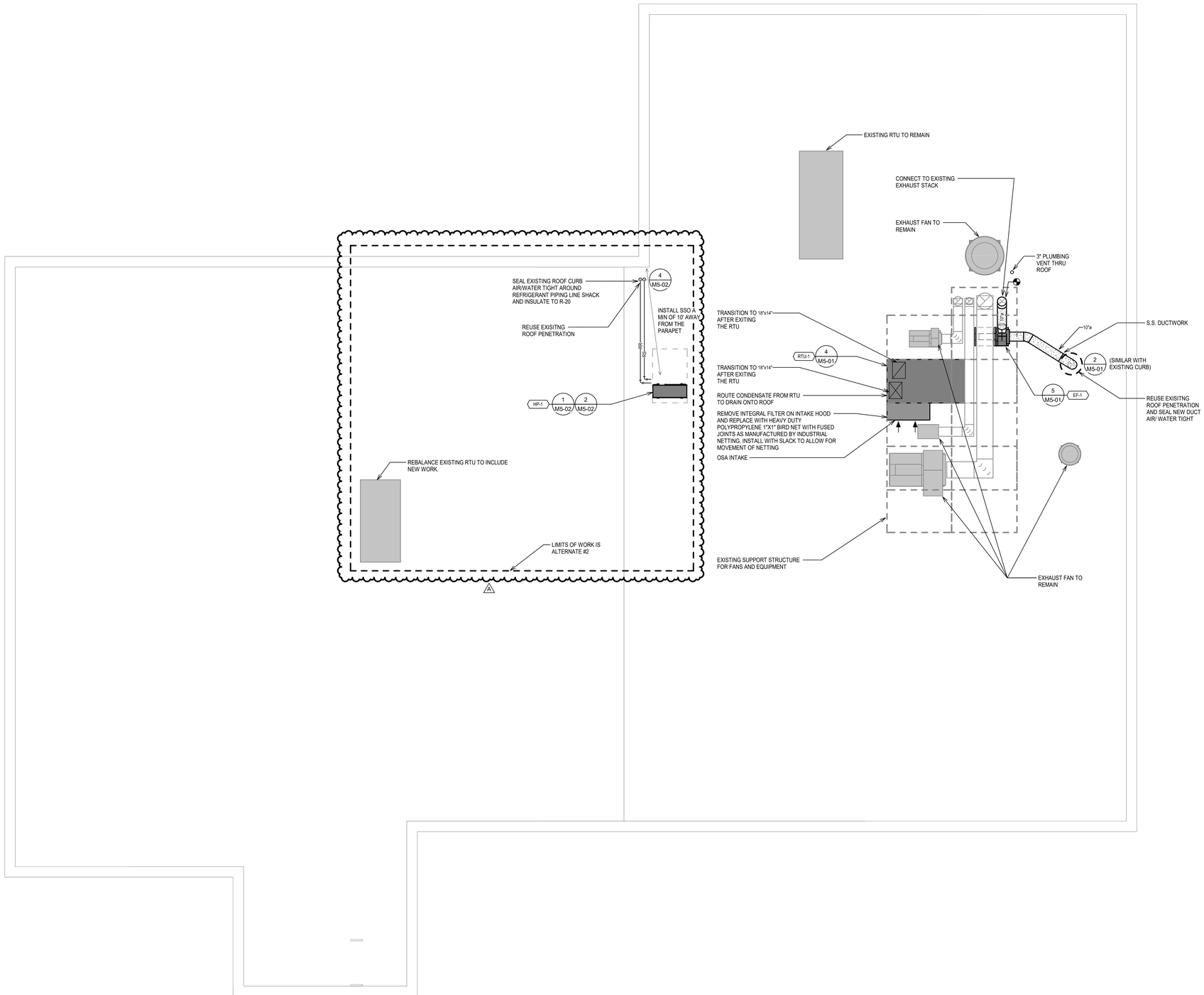
TITLE: FLOOR PLAN - MECHANICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

M2-11



ROOF PLAN - MECHANICAL

N 1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

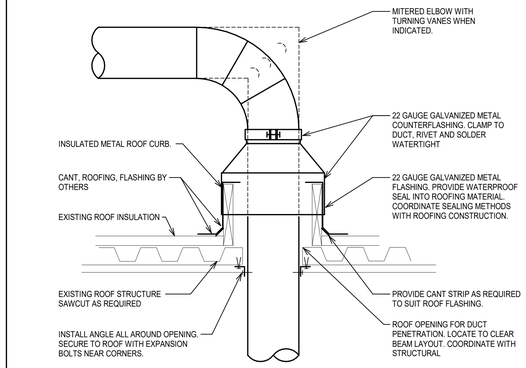
REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO 17161 JACOB DEERING

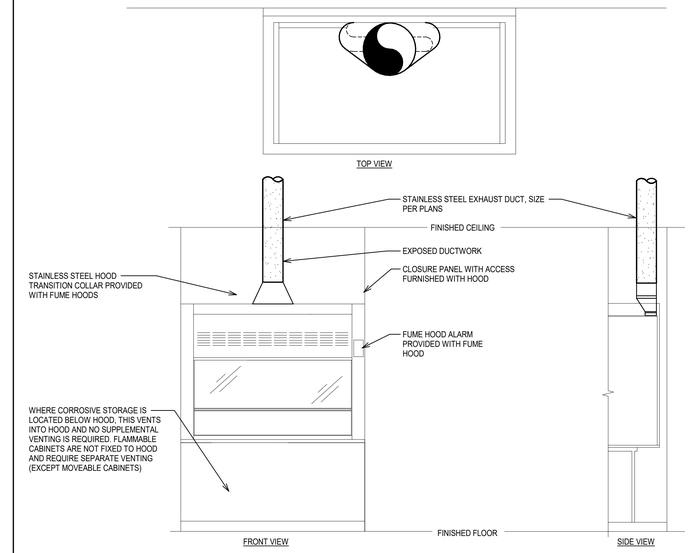
TITLE: ROOF PLAN - MECHANICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

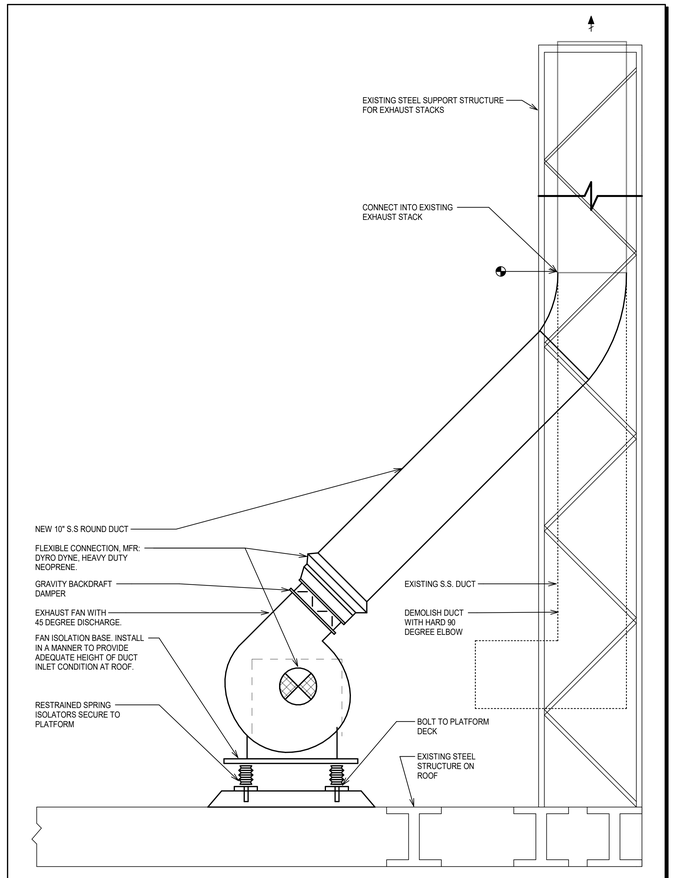
M2-12



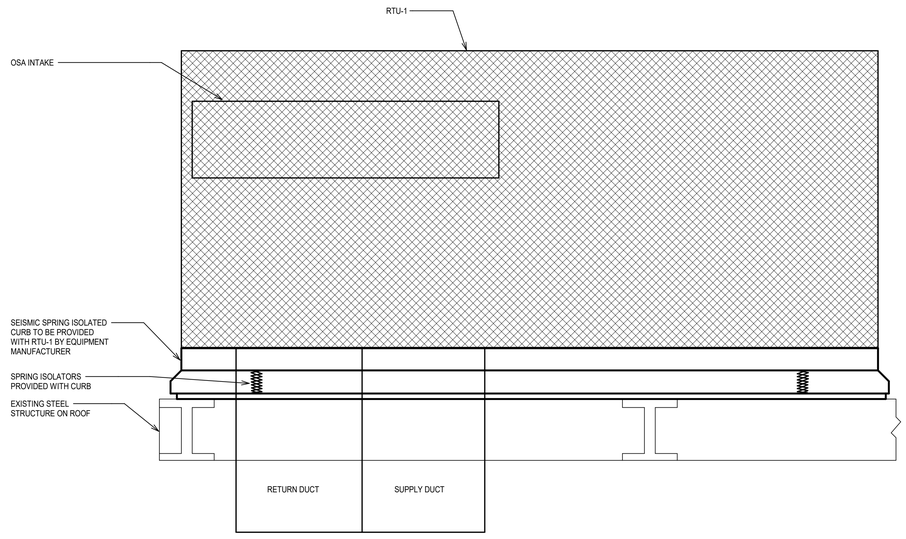
2 DUCT PENETRATION AT ROOF (M)
N.T.S.



1 FUME HOOD INSTALLATION DETAIL
N.T.S.



5 ROOF EXHAUST FAN DETAIL (UTILITY) (M)
N.T.S.



4 RTU MOUNTING
N.T.S.

GENERAL NOTE:

1. SEE EQUIPMENT SCHEDULES FOR H1 AND H2 VALUES.

3 CONDENSATE PAN DRAIN TRAP (M)
N.T.S.

KNIT
knitstudios.com

MW Engineers
601 W 1st Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9029
mwengineers.com

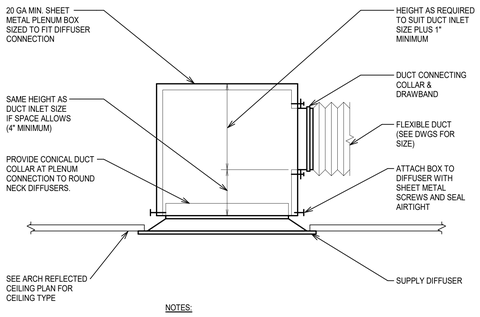
ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT

TITLE: DETAILS - MECHANICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

M5-01



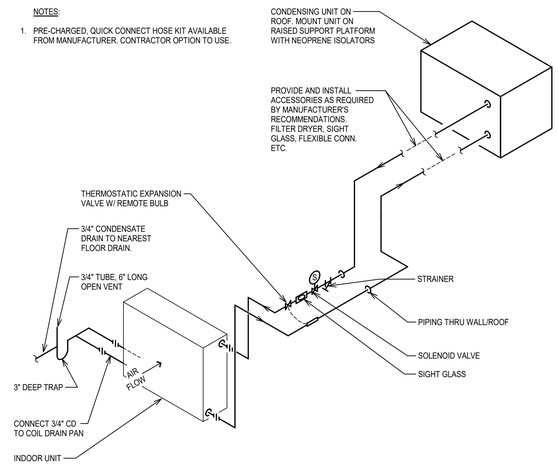
NOTES:

1. ONLY APPLICABLE WHEN SPACE CONDITIONS DO NOT ALLOW LONG RADIUS ELBOW AND STRAIGHT 12" AT DIFFUSER, SEE 'SUPPLY DIFFUSER CONNECTION DETAIL' FOR REQUIRED SUPPLY DIFFUSER INSTALLATION.

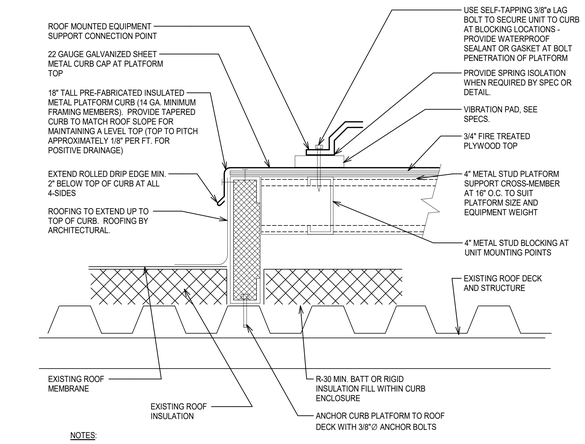
3 SUPPLY DIFFUSER BOX DETAIL (M)
N.T.S.

NOTES:

1. PRE-CHARGED, QUICK CONNECT HOSE KIT AVAILABLE FROM MANUFACTURER. CONTRACTOR OPTION TO USE.



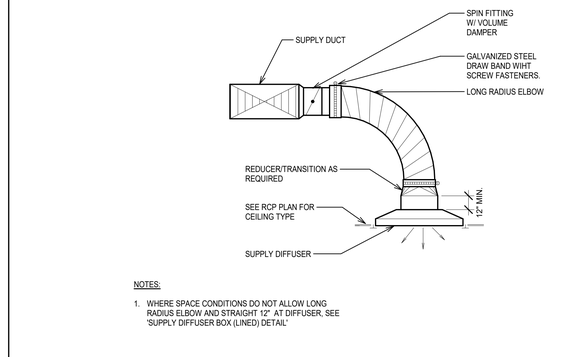
2 SPLIT SYSTEM REFRIGERANT PIPING DETAIL (M)
N.T.S.



NOTES:

1. SIZE OF CURB TO EXTEND 6" BEYOND EQUIPMENT DIMENSIONS IN ALL DIRECTIONS AND A MINIMUM OF 8" ABOVE FINISHED ROOF.
2. SOLDER WATER-TIGHT ALL SHEET METAL SEAMS AND CORNER JOINTS OF CURB CAP.

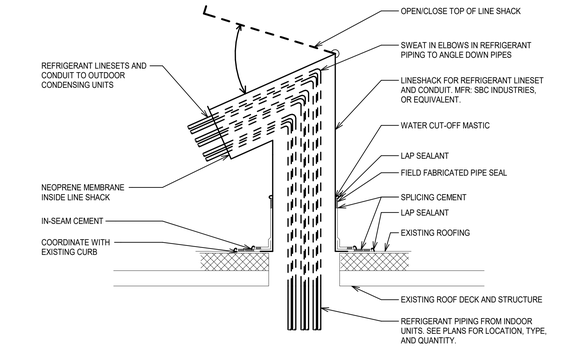
1 ROOFTOP PLATFORM DETAIL
N.T.S.



NOTES:

1. WHERE SPACE CONDITIONS DO NOT ALLOW LONG RADIUS ELBOW AND STRAIGHT 12" AT DIFFUSER, SEE 'SUPPLY DIFFUSER BOX (LINED) DETAIL'

5 SUPPLY DIFFUSER CONNECTION DETAIL (M)
N.T.S.



4 LINE SHACK DETAIL
N.T.S.

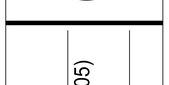
CLOUDED WORK IS ALTERNATE #2

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1100
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions



TITLE: DETAILS - MECHANICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

M5-02

PACKAGED ROOFTOP AIR HANDLING UNITS WITH ELEC HEAT

NOTES:
1. PROVIDE (4) 14"x20"x2" MERV 8 PRE-FILTERS
2. FURNISH WITH WITH CONDESATE TRAP WITH H1 = 4" AND H2 = 2". SEE CONDESATE PAN DRAIN TRAP DETAIL.
3. PROVIDE GASKETS AT ALL CONTACT POINTS BETWEEN UNIT AND ROOF CURB.
4. DISCONNECT BY DIV. 26.
5. PROVIDE WITH CLASS I LOW LEAK MOTORIZED DAMPER ON OSA .
6. PROVIDE WITH ECM MOTOR
7. PROVIDE WITH MODULATING SCROLL COMPRESSOR.
8. EER AND SEER/IEER LISTED AT AHRI RATING CONDITIONS.
9. PROVIDE WITH SPRING ISOLATION CURB.
10. PROVIDE WITH 1 YEAR WARRANTY AND 5 YEAR PARTS LIMITED WARRANTY.
11. PROVIDE UNIT WITH 2 COOLING STAGES.

			SUPPLY FAN				HEAT PUMP COOLING COIL										CONDENSER FANS		COMPRESSOR		HEAT PUMP AND ELECTRIC HEATING							ELECTRICAL					
							TEMP (F)																TEMP (F)										
TAG	MFR	SERIES	CFM	ESP	HP	MIN. OSA CFM	EAT DB	EAT WB	LAT DB	LAT WB	DESIGN AMBIENT TEMP	TOTAL BTU/H	SENSIBLE BTU/H	SEER2	EER2	REFRIGERANT	#	FLA	#	FLA	CAP (BTU/H)	COP AT 47°F	HSPF2	CFM	EAT DB	LAT DB	kW	STAGES	MCA	MOCP	V	PH	OPERATING WEIGHT (LBS)	NOTES
RTU-1	DAIKIN	DSH	1,750	1.20	2.30	560	80	63	52	52	101	53,990	53,989	16.8	12.2	R-32	1	7.7	1	15.2	59000	3.9	7.7	1750	39	97	15	4	69.3	70	208	3	630	ALL

SOUND ATTENUATOR

NOTES:
SILENCERS SHALL BE TESTED IN STRICT ACCORDANCE WITH THE 1999 ASTM E477 STANDARD (STANDARD METHOD OF TESTING DUCT LINER MATERIALS AND PREFABRICATED SILENCERS FOR ACOUSTICAL AND AIRFLOW PERFORMANCE) WITH AIR FLOWING THROUGH THE SILENCERS, BOTH WITH AND AGAINST AIRFLOW. A NEGATIVE FACE VELOCITY IMPLIES SOUND TRANSMISSION IN THE OPPOSITE DIRECTION TO AIRFLOW. ASTM E477 SHALL HAVE BEEN PERFORMED IN A LABORATORY THAT IS NVLAP-ACCREDITED TO CONDUCT THE TEST.

						ATTENUATOR DIMENSIONS						DYNAMIC INSERTION LOSS							
												SELF GENERATED NOISE							
TAG	MFR	MODEL	SERVICE	STYLE	MATERIAL	WIDTH (")	HEIGHT (")	LENGTH (")	FLOW (CFM)	VELOCITY (FPM)	SILENCER APD W/ SYSTEM EFFECTS (")	63	125	250	500	1000	2000	4000	8000	NOTES
AT-1	VIBRO-ACOUSTICS	REFL-UHV-F8	RTU SUPPLY	ELBOW ATTENUATOR	GALVANIZED	14"	18"	48"	1750	1000	0.13	4	4	7	11	16	26	25	18	
AT-2	VIBRO-ACOUSTICS	REFL-MV-F8	RTU RETURN	ELBOW ATTENUATOR	GALVANIZED	14"	18"	48"	1100	629	0.10	6	9	14	23	28	33	33	23	

AIR INLETS & OUTLETS

NOTES:
1. PROVIDE WITH WHITE BAKED ENAMEL FINISH.

								BLADE			
TAG	MFR	MODEL	SERVICE	TYPE	MATERIAL	MOUNTING	PATTERN	SPC (")	POS	DEFL (")	NOTES
CD-1	PRICE	SMCD	SUPPLY	DIFFUSER	STEEL	SURFACE	4-WAY	-	ADJ	-	1
CD-2	PRICE	FRFDP	SUPPLY	RADIAL FLOW	STEEL	SURFACE	2-WAY	-	-	-	1
RG-1	PRICE	530	RETURN/EXHAUST	GRILLE	STEEL	SURFACE	FIXED	1/2	HOR	45	1
SG-1	PRICE	510	SUPPLY	GRILLE	STEEL	SIDEWALL	FIXED	1/2	HOR	45	1

EXHAUST FANS

NOTES:
1. DISCONNECT BY DIV. 26
3. PROVIDE STAINLESS STEEL GRAVITY BACKDRAFT DAMPER.
4. PROVIDE WITH RESTRAINED SPRING ISOLATORS. SEE MOUNTING DETAIL.
5. PROVIDE WITH 45 DEGREE DISCHARGE.

										MOTOR				
TAG	MFR	MODEL	TYPE	SERVICE	DRIVE	MAX CFM	ESP (")	FAN RPM	SONE LEVEL	BHP	HP	V	PH	NOTES
EF-1	GREENHECK	10-BCSW-*FRP*	CONSTANT	207 FUME HOOD	BELT	810	1.00	1009	7.5	0.26	0.33	208	1	ALL

CONDENSING UNIT SCHEDULE

NOTES:
1. DISCONNECT BY DIV. 26.
2. PROVIDE ROOF JACK FOR REFRIGERANT LINES, EQUAL TO "LINE SHACK, MODEL LS". REFER TO THE DETAIL SHEETS FOR MORE INFORMATION.
3. PROVIDE REFRIGERANT PIPING AS REQUIRED BETWEEN INDOOR AND OUTDOOR UNITS. PROVIDE ALL ACCESSORIES AND REFNET JOINTS AS REQUIRED BY THE MANUFACTURER.
4. REFER TO DETAIL SHEETS FOR INFORMATION ON UNIT MOUNTING TO PLATFORM ON SLOPED ROOF.
5. UNIT SHALL SIT ON NEOPRENE SNUBBER VIBRATION ISOLATION. REFER TO THE SPECIFICAITONS FOR MORE INFORMATION.

TAG	MFR	MODEL	INDOOR UNIT	COOLING CAPACITY BTU/H	HEATING CAPACITY BTU/H	AMBIENT COOLING TEMP. (F)	AMBIENT HEATING TEMP. (F, DB/WB)	REFRIGERANT TYPE	MCA	MOCP	RLA	V	PH	SEER2/EER2	OPERATING WEIGHT (LBS)	NOTES
HP-1	DAIKIN	RXM18WVJU9	FC-1	22000	21600	95	47	R-32	18.8	20	18.3	208	1	22.7/12.5	250.00	ALL

DUCTLESS SPLIT SYSTEM IS ALTERNATE #2

FAN COIL UNIT SCHEDULE

NOTES:
1. DISCONNECT BY DIV. 26.
2. PROVIDE WITH 24/7 PROGRAMMABLE THERMOSTAT, BASIS OF DESIGN: DAIKIN MODEL BRC1E73.
3. REFRIGERANT SUPPLY AND RETURN LINES SHALL BE SIZED BY EQUIPMENT MANUFACTURER.
4. PROVIDE WITH INTERGRAL SUPPLY/ RETURN GRILLE AND FILTER.
5. INDOOR FC-1 IS POWERED BY HP-1.
6. PROVIDE WITH INTEGRAL CONDENSATE PUMP, TO BE INSTALLED INSIDE FAN COIL UNIT.
7. PROVIDE WITH INTERFACE ADAPTER FOR BAS CONTROL.

				SUPPLY FAN	COOLING CAPACITY	HEATING CAPACITY	ELECTRICAL			
TAG	MFR	MODEL	ASSOCIATED HP	AIR FLOW CFM	NOMINAL SENSIBLE Btu/h	NOMINAL CAPACITY Btu/h	V	PH	SOUND dBA	NOTES
FC-1	DAIKIN	FTXM18WVJU9	HP-1	777	18000	21600	208	1	49	ALL

THE FUME HOOD IS ALTERNATE #3. FUME HOOD INSTALLATION IS BASE BID.

CHEMICAL FUME HOODS

NOTES:
1. EXHAUST IS SIZED FOR DESIGN OPERATING CONDITIONS. CONSTANT VOLUME FUME HOOD.
2. PROVIDE WITH LAMINATED SAFETY GLASS.
3. PROVIDE WITH FACTORY INSTALLED DIGITAL AIRFLOW MONITOR (AIR ALERT 600, A2), AND CONTROL VOLTAGE TRANSFORMER (IF REQUIRED) AND 120V SUPPLY PRE-WIRED TO TOP OF HOOD WITH J-BOX FUIRNISHED WITH HOOD. PROVIDE WITH BLACK COLORED QUAD 20 AMP RECEPTACLE. OPTION U2 (EXPLOSION PROOF).
4. PROVIDE WITH SASH STOP.
5. PROVIDE WITH AIR, GAS AND WATER SERVICE FIXTURES, PRE-PLUMBED. PROVIDE WITH ROD CONTROLLED BALL VALVES.
6. PROVIDE WITH TISSUE SCREEN KIT.
7. PROVIDE WITH REAR FINISH PANELS.
8. PROVIDE WITH 36" ACID AND SOLVENT BASE CABINETS. ACID CABINET TO HAVE VENT KIT.
9. PROVIDE WITH ADA COMBO SASH.
10. SASH FRAME = POWDER COATED STEEL. INTERIOR LINER MATERIAL = KEMGLASS.
11. PROVIDE WITH STAINLESS STEEL DUCT COLLAR
12. WORKTOP COLOR SHALL BE BLACK. PROVIDE WITH FLUSH MOUNTED CUPSINK. LOCATION LEFT REAR.

									DESIGN OPERATING CONDITIONS							
TAG #	MFR	MODEL	HOOD SIZE AND TYPE	TYPE OF SASH	TYPE OF SILL	NUMBER OF VERTICAL SASHES	NOMINAL VERTICAL SASH HEIGHT		SASH OPENING	FACE VELOCITY	AIRFLOW	MIN AIR FLOW	MAX HOOD STATIC PRESSURE DROP	EXH CONN. SIZE	ELECTRICAL CONNECTION	NOTES
							INCH		INCH	FPM	CFM					
FH-1	KEWAUNEE	SUPREME AIR VENTURI	6' BENCHTOP CHEMICAL FUME HOOD	COMBO	S.S. AIRFOIL	1	28		18	100	810	810	0.25"	12"	120V/1PH	ALL

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

SCHEDULES - MECHANICAL
FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
UNIVERSITY OF IDAHO

TITLE | PROJECT | CLIENT

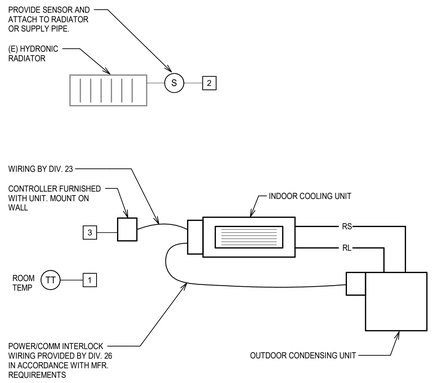
JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

M6-01

Energy Management & Control System Points Identification						
	Name/Function	AI	AO	DI	DO	Remarks
1	Space Temp	✓				
2	Heat Sensor	✓				
3	Disable Fan Coil Cooling				✓	

SEQUENCE OF OPERATION:

INDOOR FAN COIL AND CONDENSING UNIT SHALL CYCLE UPON DEMAND FOR COOLING FROM UNIT PROVIDED SPACE SENSOR.
WHEN THE RADIATOR SENSOR SENSES HEAT (ABOVE 110 DEGREES) ADJ. THE FAN COIL COOLING SHALL BE LOCKED OUT.



3 DUCTLESS SPLIT SYSTEM CONTROL DIAGRA
N.T.S.

A

DUCTLESS SPLIT SYSTEM IS ALTERNATE #2

Energy Management & Control System Points Identification						
	Name/Function	AI	AO	DI	DO	Remarks
1	Space Temp	✓				
2	OSA Temp	✓				
3	Discharge Temp	✓				
4	Heat Pump Status/Alarm			✓		
5	Heat Pump Enable/Disable				✓	
6	Heat/Cool Enable/Disable				✓	
7	Heat/Cool Enable/Disable	✓				

SEQUENCE OF OPERATION

FAILURE OF FUME HOOD EXHAUST FAN EF-1 SHALL DISABLE THE RTU.

OCCUPIED MODE

THE SUPPLY FAN SHALL BE ON AND SHALL OPERATE CONTINUOUSLY.

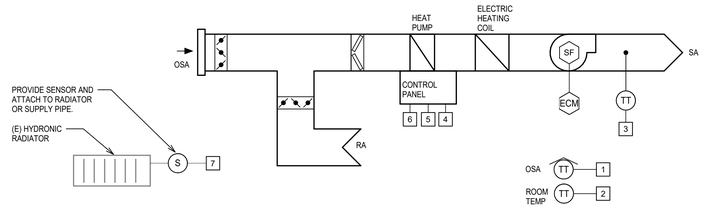
WITH NO DEMAND FOR COOLING (SPACE TEMPERATURE SATISFIED) AND A CALL FOR HEATING, THE HEAT PUMP SHALL OPERATE AS THE FIRST STAGE OF HEATING. ADDITIONAL CALL FOR HEAT SHALL ENABLE THE ELECTRIC RESISTANCE HEATING. THE HEATING COIL SHALL MODULATE STAGES OF HEAT TO MAINTAIN THE LEAVING AIR TEMPERATURE SETPOINT. THE REVERSE SHALL OCCUR UPON A REDUCED DEMAND FOR HEATING.

A CALL FOR COOLING TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SHALL ENABLE THE HEAT PUMP COOLING. COOLING SETPOINT SHALL BE RESET BETWEEN 52 AND 60 (ADJ). THE COMPRESSOR SHALL BE ENABLED AND SHALL MODULATE TO MAINTAIN THE REQUIRED DISCHARGE AIR TEMPERATURE. THE REFRIGERATION CONTROLS SHALL BE SENSITIVE TO RAPID CYCLING OF COMPRESSORS AS IT AFFECTS COOLING COIL DISCHARGE AIR TEMPERATURE STABILITY. WHEN THE RADIATOR SENSOR SENSES HEAT (ABOVE 110 DEGREES) ADJ. THE RTU COOLING SHALL BE LOCKED OUT.

THE CONDENSING UNIT FACTORY CONTROLS SHALL START/STOP/MODULATE THE CONDENSING UNIT FAN.

OUTSIDE AIR DAMPER SHALL BE SET TO A FIXED POSITION TO SUPPLY MAKE-UP AIR TO THE FUME HOOD EXHAUST.

UNOCCUPIED MODE
DEMAND FOR UNOCCUPIED PERIOD HEATING/COOLING SHALL OPERATE AS DESCRIBED IN OCCUPIED MODE. UNOCCUPIED HEATING SETPOINTS SHALL BE 10 DEGREES LOWER AND COOLING SHALL BE 10 DEGREES HIGHER THEN OCCUPIED SETPOINTS. UNIT IS EXPECTED TO OPERATE 24 HOURS A DAY TO PROVIDE MAKEUP AIR TO THE FUME HOOD EXHAUST FAN.



1 HEAT PUMP ROOFTOP UNIT RTU-1
N.T.S.

Energy Management & Control System Points Identification						
	Name/Function	AI	AO	DI	DO	Remarks
1	Fan Start/Stop				✓	
2	Status/Alarm			✓		

SEQUENCE OF OPERATION:

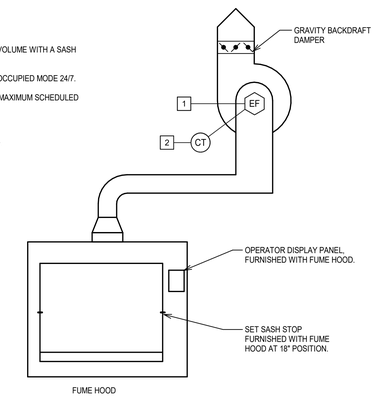
FUME HOOD CONTROL: FUME HOODS ARE CONSTANT VOLUME WITH A SASH BYPASS.

FUME HOOD AND LAB ARE EXPECTED TO OPERATE IN OCCUPIED MODE 24/7.

OCCUPIED MODE: THE EXHAUST FAN SHALL MAINTAIN MAXIMUM SCHEDULED CFM.

FAILURE OF EXHAUST FAN SHALL ALARM THE BAS.

UNOCCUPIED MODE: THE EXHAUST FAN SHALL BE OFF



2 FUME HOOD EXHAUST FAN CONTROL DIAGRAM
N.T.S.

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9020
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

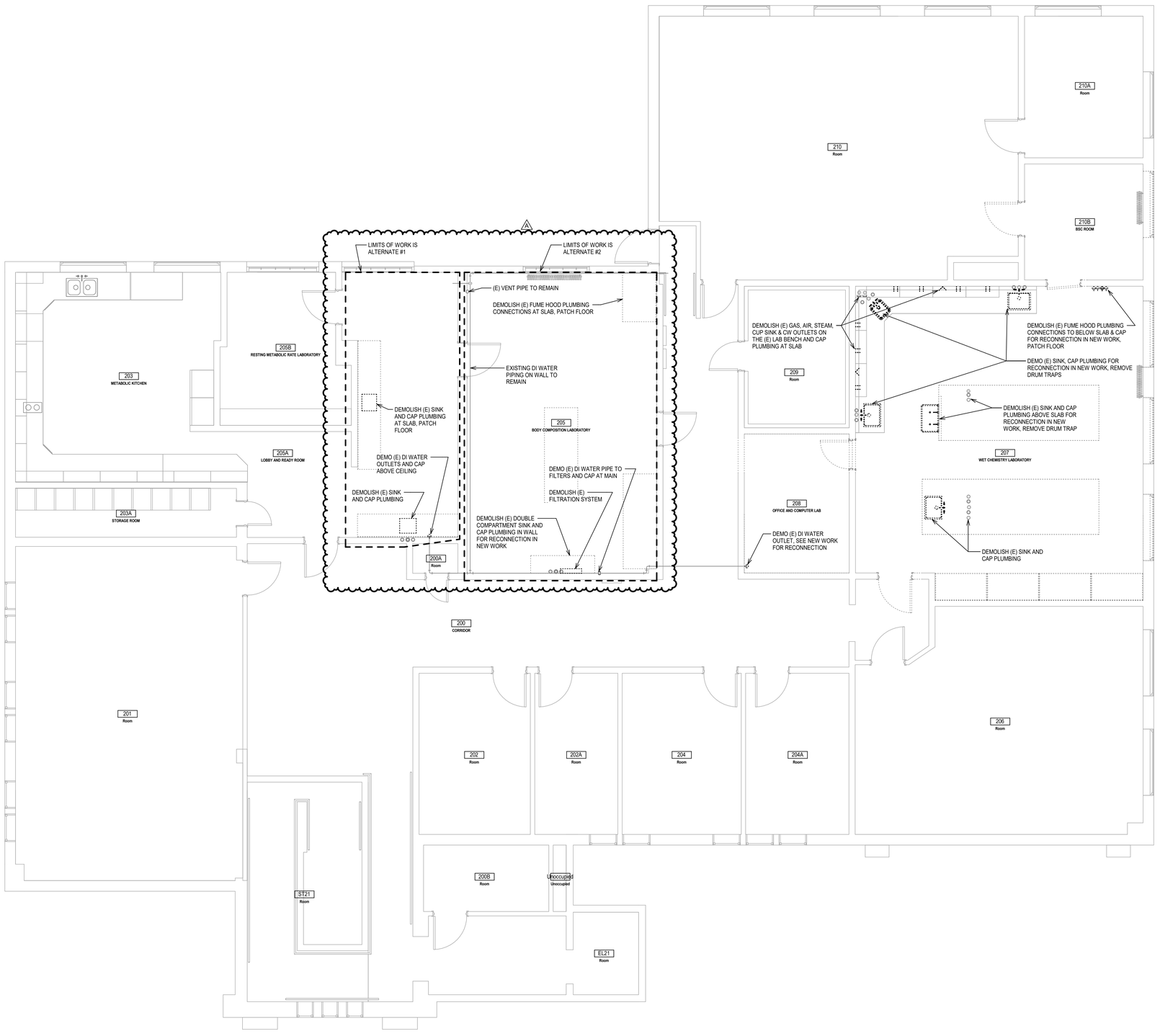
TITLE: CONTROLS - MECHANICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

M7-01



LEVEL 2 - DEMOLITION PLAN - PLUMBING

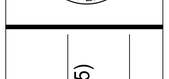
1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions



TITLE: DEMO FLOOR PLAN - PLUMBING

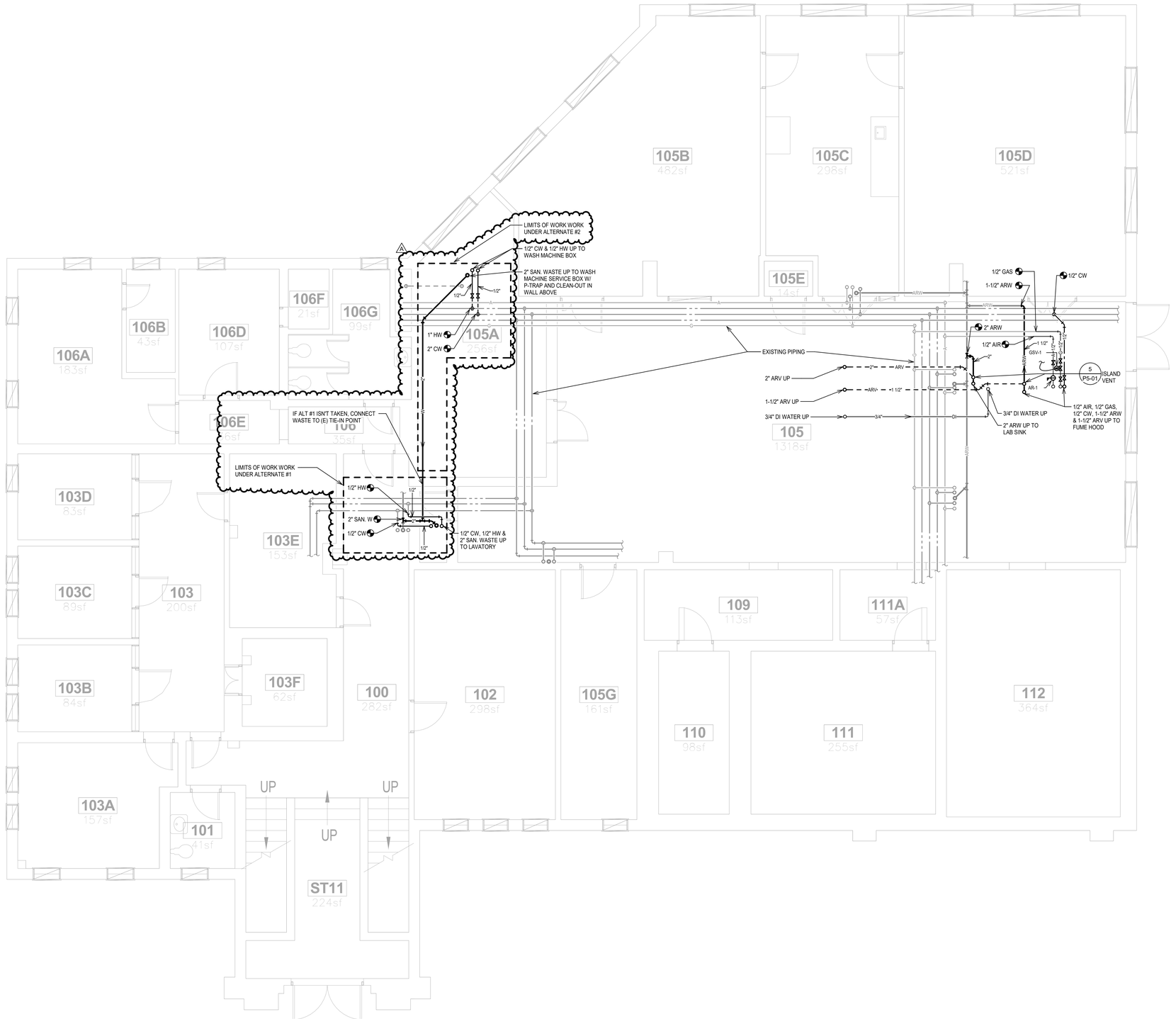
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

PD2-11

GENERAL NOTES:
1. ALL WASTE PIPING 4" AND LARGER IN SIZE SHALL SLOPE AT 1% GRADE.
2. ALL WASTE PIPING 3" AND LESS IN SIZE SHALL SLOPE AT 2% GRADE.
3. ALL VENT PIPING SHALL SLOPE AT 1% GRADE OR FLAT.
4. ALL PLUMBING FIXTURES SHALL BE PROVIDED WITH WATER HAMMER ARRESTORS WHETHER INDICATED ON PLANS OR DETAILS OR NOT PER DIV. 22 SPECIFICATIONS.



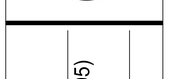
LEVEL 1 - PLUMBING
1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1100
Spokane, WA 99201, USA
509.838.0026
mwengineers.com

ISSUE DATE: **07.21.2025**

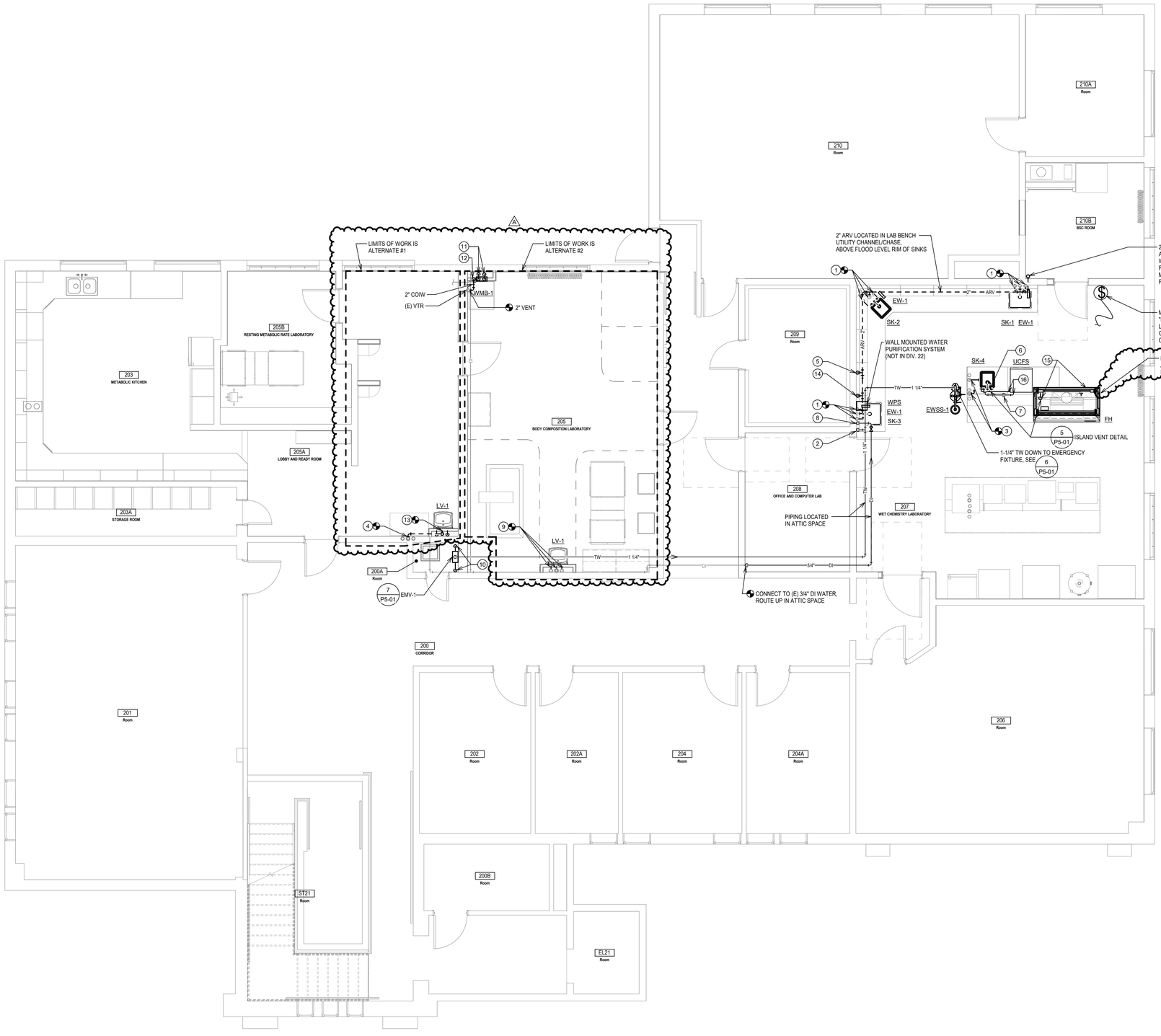
REV	DATE	COMMENT
A	7/21/2025	Owner Revisions



TITLE: LEVEL 1 FLOOR PLAN - PLUMBING
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

P2-10



LEVEL 2 - PLUMBING

1/4" = 1'-0"

GENERAL NOTES:

1. ALL WASTE PIPING 4" AND LARGER IN SIZE SHALL SLOPE AT 1% GRADE
2. ALL WASTE PIPING 3" AND LESS IN SIZE SHALL SLOPE AT 2% GRADE.
3. ALL VENT PIPING SHALL SLOPE AT 1% GRADE OR FLAT.
4. ALL PLUMBING FIXTURES SHALL BE PROVIDED WITH WATER HAMMER ARRESTORS WHETHER INDICATED ON PLANS OR DETAILS OR NOT PER DIV. 22 SPECIFICATIONS.

KEY NOTES:

#	
1	CONNECT NEW LAB SINK TO EXISTING 1/2" CW, 1/2" HW & 1-1/2" ARW IN LAB BENCH. PROVIDE NEW WATER SUPPLY STOPS. PROVIDE NEW ARV ROUTED THRU ROOF IN LIEU OF EXISTING DRUM TRAPS.
2	1/2" TW DOWN ON WALL AND ROUTED INSIDE LAB BENCH CABINET SPACE W/ 1/2" TW TO EACH EMERGENCY EYEWASH
3	CONNECT NEW LAB SINK TO EXISTING 1/2" CW & 1/2" HW UNDER LAB BENCH. PROVIDE NEW 2" ARW AND 2" ACID RESISTANT ISLAND VENT
4	CONNECT NEW 1-1/2" VENT FROM LAVATORY TO EXISTING VENT THRU ROOF IN ATTIC SPACE
5	2" ARV DOWN THRU FLOOR
6	2" ARV ISLAND VENT DOWN THRU FLOOR
7	3/4" DI WATER DOWN THRU FLOOR
8	3/4" DI WATER DOWN ON WALL TO BELOW LAB BENCH. ROUTE 3/4" DI WATER TO WATER PURIFICATION SYSTEM AND 3/4" DI WATER CONTINUING DOWN IN LAB BENCH CABINET SPACE TO BELOW FLOOR
9	CONNECT NEW LAVATORY TO EXISTING 1/2" CW, 1/2" HW, 1-1/2" VENT & 2" WASTE IN WALL. PROVIDE NEW WATER SUPPLY STOPS
10	ROUTE & CONNECT NEW 3/4" CW & 3/4" HW TO NEAREST (E) 3/4" HW & CW PIPES
11	1/2" CW & 1/2" HW DOWN IN CHASE THRU FLOOR
12	1/2" CW, 1/2" HW & 2" VENT DOWN IN WALL TO WASH MACHINE BOX. PROVIDE 2" WASTE OUTLET FROM BOX W/ P-TRAP IN WALL
13	1/2" CW, 1/2" HW & 2" WASTE UP FROM BELOW SLAB TO LAVATORY.
14	1-1/2" ARV DOWN THRU FLOOR
15	1/2" AIR, 1/2" GAS, 1/2" CW, 1-1/2" ARW & 1-1/2" ACID RESISTANT ISLAND VENT UP THRU FLOOR TO FUME HOOD UTILITY CHASE
16	EXTEND 1/2" DI WATER AND 1/2" HW TO FLASK SCRUBBER

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.0029
mwengineers.com

ISSUE DATE: **07.21.2025**

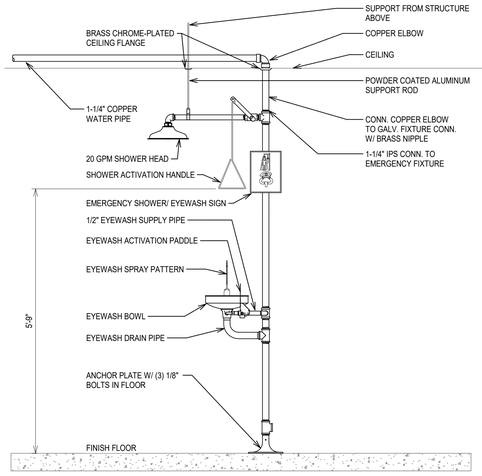
REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSE 17162 STATE OF IDAHO JACOB DEERING

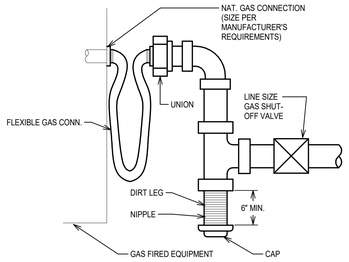
TITLE: LEVEL 2 FLOOR PLAN - PLUMBING
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

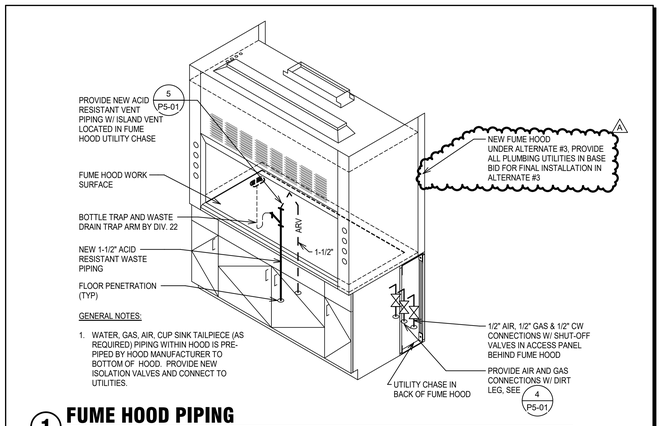
P2-11



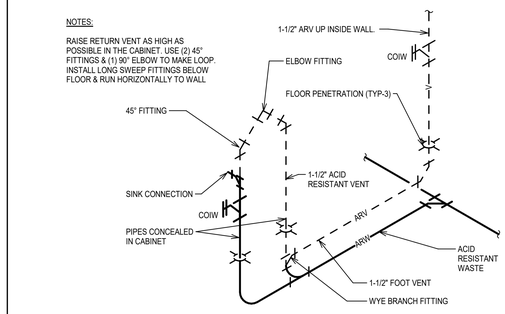
6 EMERGENCY SHOWER & EYEWASH
N.T.S.



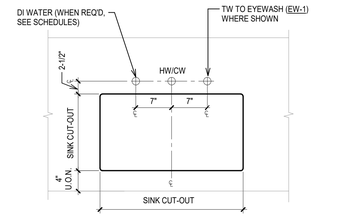
4 DIRT LEG FLEXIBLE GAS CONN. DETAIL
N.T.S.



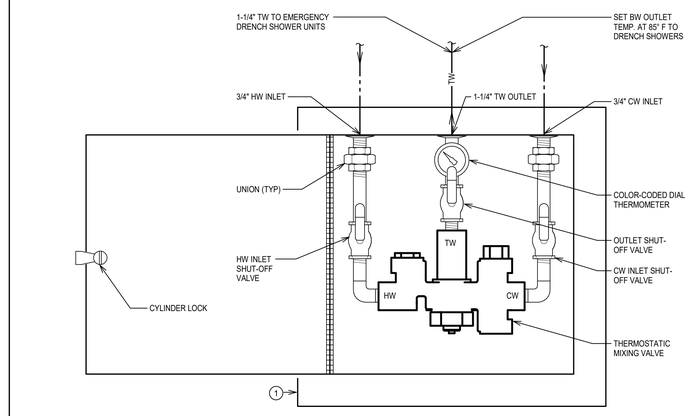
1 FUME HOOD PIPING
N.T.S.



5 ISLAND VENT PIPING DETAIL
N.T.S.



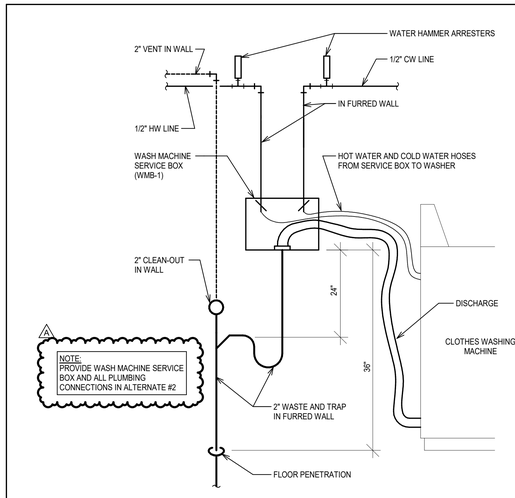
2 TYPICAL SERVICE SPACING AT SINKS
N.T.S.



(#) KEY NOTES:

1. PROVIDE EMERGENCY THERMOSTATIC WATER MIXING VALVE IN SURFACE MOUNTED STAINLESS STEEL CABINET WITH (LEFT) HINGED DOOR AND CYLINDER LOCK. ADJUSTABLE HIGH TEMPERATURE LIMIT STOP, OUTLET BALL VALVE, AND DIAL THERMOMETER.

7 EMERGENCY MIXING VALVE (EMV)
N.T.S.



3 CLOTHES WASHING MACHINE CONNECTIONS
N.T.S.

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9020
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

DETAILS - PLUMBING

TITLE

FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

PROJECT

UNIVERSITY OF IDAHO

CLIENT

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

P5-01

PLUMBING FIXTURE SCHEDULE

NOTES:
1. VERIFY SIZES ON SITE AND COORDINATE INSTALLATION IN EXISTING COUNTERTOP & CASEWORK, SEE DETAIL 2 ON P5-01
2. PROVIDE NEW BRASSCRAFT STOPS & SUPPLIES (KTSCR19X-C)
3. PROVIDE WITH CHICAGO FAUCETS 131-ABNF THERMOSTATIC MIXING VALVE & TRUEBRO LAV SHIELD #82202
4. DI WATER FAUCET: WATERSAVER L694-LH. "LAV GUARD 2 E-Z SERIES" ADA SCALD PROTECTION AND DISHWASHER AIRGAP KIT.

TAG	FIXTURE DESCRIPTION	MANUFACTURER	MODEL	MOUNTING	FIXTURE TYPE	MATERIAL	SIZE	MFR & MODEL # OF FAUCET & VALVE	DRAIN TYPE	TRAP	CARRIER	ACCESSORIES	WASTE	VENT	HW	CW	ARW	ARV	DI WATER	TW	ELECTRICAL REMARKS	SUPPLIES	NOTES
EW-1	EMERGENCY EYEWASH	GUARDIAN	G5022BP-FSH	DECK	DRENCH HOSE	BRASS & NYLON	10-1/8" TALL	INTEGRAL	-	-	-	8 FT. FLEXIBLE ST. STL. HOSE	-	-	-	-	-	-	-	1/2"	-	BRASSCRAFT KTSCR19X-C	5 GPM, ROUTE TW FROM MIXING VALVE MV-1
EWSS-1	EMERGENCY EYEWASH & SAFETY SHOWER	ULINE	H-6697	FREE STANDING	SHOWER/EYE WASH COMBO	POWDER COATED STEEL & PLASTIC	94-3/4" TALL	INTEGRAL	-	1-1/2" x 17 GA.	-	-	-	-	-	-	-	-	-	1-1/4"	-	-	25 GPM, ROUTE TW FROM MIXING VALVE MV-1
LV-1	ADA LAVATORY	KOHLER	"GREENWICH" K-2031	WALL	SELF-DRAINING DECK	VITREOUS CHINA	20-3/4"x18-1/4"x12-7/8"	CHICAGO FAUCETS 116.858.AB.1	ELKAY LK174	1-1/2" x 17 GA.	JAY R. SMITH 0710	NOTE 3	2"	1-1/2"	1/2"	1/2"	-	-	-	1/2"	PROVIDE WITH BATTERIES	BRASSCRAFT KTSCR19X-C	INSTALL PER ADA REQUIREMENTS, UNDER ALTERNATE #1 & 2 (A)
SK-1	LAB SINK	DURCON	U52	IN EXISTING COUNTERTOP	UNDERMOUNT	EPOXY	23.-2/3"x17-2/3"x10-3/4"	WATERSAVER L414	DURCON STRAINER	BOTTLE TRAP SPEARS CPVC DILUTION TANK	-	-	-	-	1/2"	1/2"	1-1/2"	1-1/2"	-	-	-	-	NOTE 1
SK-2	LAB SINK	DURCON	U20	IN EXISTING COUNTERTOP	UNDERMOUNT	EPOXY	16"x16"x7-1/2"	WATERSAVER L414	DURCON STRAINER	BOTTLE TRAP SPEARS CPVC DILUTION TANK	-	-	-	-	1/2"	1/2"	1-1/2"	1-1/2"	-	-	-	-	NOTE 1
SK-3	LAB SINK	DURCON	U52	IN EXISTING COUNTERTOP	UNDERMOUNT	EPOXY	23.-2/3"x17-2/3"x10-3/4"	WATERSAVER L414	DURCON STRAINER	BOTTLE TRAP SPEARS CPVC DILUTION TANK	-	DI WATER FAUCET: WATERSAVER L691-LH	-	-	1/2"	1/2"	1-1/2"	1-1/2"	1/2"	-	-	-	NOTE 1, CONNECT DI WATER FAUCET TO ADJACENT WATER PURIFICATION SYSTEM
SK-4	ADA LAB SINK	DURCON	U20	COUNTERTOP	UNDERMOUNT	EPOXY	16"x16"x7-1/2"	WATERSAVER L414-BH	DURCON STRAINER	BOTTLE TRAP SPEARS CPVC DILUTION TANK	-	NOTE 4	-	-	1/2"	1/2"	1-1/2"	1-1/2"	1/2"	-	-	-	NOTE 1, INSTALL PER ADA REQUIREMENTS
WMB-1	WASH MACHINE SERVICE BOX	GUY GRAY	MWB13	WALL	RECESSED IN WALL	POWDER COATED STEEL	10-7/8"x8-3/8"	QUARTER TURN VALVES	OPEN HUB	2"x17 GA STANDPIPE	-	-	2"	2"	1/2"	1/2"	-	-	-	-	-	-	SEE DETAIL 3, SHEET P5-01 UNDER ALTERNATE #2 (A)

SOLENOID VALVE SCHEDULE

MFR BASIS OF DESIGN: ASCO

SYMBOL	MANUFACTURER	CATALOG NO.	SIZE	OPERATION	SERVICE	ELECTRICAL	NOTES
GSV-1	ASCO	SERIES 8040	1/2"	NORMALLY CLOSED	NAT-GAS (SERVES LAB GAS OUTLETS AS INDICATED ON PLANS)	120V / 60Hz / 15W / 1 AMP	(1)(2)(3)

NOTES:
(1) VALVE SHALL BE LINE SIZE
(2) VALVE IS OPEN WHEN ENERGIZED; CLOSED WHEN DE-ENERGIZED
(3) PROVIDE W/ AMERICAN GAS SAFETY MODEL "AGSEGOTW" EMERGENCY GAS SHUT OFF PUSH BUTTON WITH TWIST-RESET

WATER HAMMER ARRESTER SIZING CHART

SYMBOL	FIXTURE UNIT RATING	JAY R. SMITH FIG. NO.	CONNECTION TO SUPPLY PIPE
WHA-1	1-11	5005	3/4"
WHA-2	12-32	5010	1"
WHA-3	33-60	5020	1"

NOTE:
WATER HAMMER ARRESTERS SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS AND IN ACCORDANCE WITH THIS SCHEDULE. INSTALL WATER HAMMER ARRESTERS AT ALL QUICK CLOSING VALVES, SOLENOID VALVES, EACH PLUMBING FIXTURE AND AT EACH BATTERY OF FIXTURES IN DOMESTIC HOT AND COLD WATER SYSTEMS.

LAB EQUIPMENT CONNECTION SCHEDULE

NOTES:
EQUIPMENT NOT IN DIV. 22

TAG	DESCRIPTION	MOUNTING	TRAP	ARW	ARV	HW	CW	GAS	AIR	IW	DI WATER	REMARKS
FH	FUME HOOD	FREE STANDING	BOTTLE TRAP SPEARS CPVC DILUTION TANK	1-1/2"	1-1/2"	-	1/2"	1/2"	1/2"	-	-	SEE DETAIL 1 ON SHEET P5-01
UCFS	UNDERCOUNTER FLASK SCRUBBER	FLOOR	-	-	-	1/2"	-	-	-	3/4"	1/2"	ROUTE IW TO ADJACENT SINK W/ DISHWASHER AIRGAP. PROVIDE SUPPLY HOSE AND STOPS
WPS	WATER PURIFICATION SYSTEM	WALL	-	-	-	-	-	-	-	-	3/4"	-

EMERGENCY MIXING VALVE SCHEDULE

MV-#	MFR	MODEL	CW INLET	HW INLET	BW OUTLET	MOUNTING TYPE	MOUNTING HEIGHT	OUTLET TEMPERATURE	NOTES
EMV-1	GUARDIAN	G6042	3/4"	3/4"	1 1/4"	WALL	6' - 0"	85 °F	EMERGENCY MIXING VALVE FOR EMERGENCY SHOWERS, SEE DETAIL 7, SHEET P5-01

AIR PRESSURE REGULATORS SCHEDULE

TAG	MANUFACTURER	MODEL #	UNIT SIZE (INCHES)	INLET PRESSURE (PSIG)	OUTLET PRESSURE SETTING (PSIG)	REGULATOR CAPACITY (SCFM)	LOAD (SCFM)	NOTES
AR-1	WILKERSON	RB3	1/2"	VERIFY EXISTING	15	14 CFM	1.0	PROVIDE WITH GAUGE

KNIT
knitstudios.com

MW Engineers
601 W 1st Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JACOB DEERING 17161

TITLE: SCHEDULES - PLUMBING
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

P6-01

SYMBOLS & ABBREVIATIONS

ELECTRICAL SPECIFICATIONS

GENERAL

ELECTRICAL WORK SHALL INCLUDE FURNISHING ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICES TO CONSTRUCT AND INSTALL THE COMPLETE ELECTRICAL SYSTEMS AS SHOWN ON THESE DRAWINGS AND DESCRIBED IN THESE SPECIFICATIONS.

CODES, PERMITS AND FEES

THE INSTALLATION OF THIS WORK SHALL COMPLY IN EVERY WAY WITH THE REQUIREMENTS OF ALL APPLICABLE LAWS, ORDINANCES, AND RULES OF THE STATE OF IDAHO, OSHA, THE NATIONAL BOARD OF FIRE UNDERWRITERS, AND THE NATIONAL ELECTRICAL CODE. IF ANY CONFLICT OCCURS BETWEEN THESE RULES AND THIS SPECIFICATION, THE RULES SHALL GOVERN. NOTHING IN THESE DRAWINGS AND SPECIFICATIONS SHALL BE CONSTRUED TO PERMIT WORK NOT CONFORMING WITH GOVERNING CODES. THIS SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR FROM COMPLYING WITH REQUIREMENTS OF THE PLANS OR SPECIFICATIONS WHICH MAY BE IN EXCESS OF REQUIREMENTS OF HEREIN BEFORE MENTIONED RULES AND NOT CONTRARY TO SAME. OBTAIN AND PAY FOR ALL REQUIRED STATE AND LOCAL INSTALLATION INSPECTIONS. DELIVER ORIGINALS OF THESE CERTIFICATES IN THE OPERATING AND MAINTENANCE INSTRUCTIONS.
ALL MATERIALS SHALL BE UL LISTED AND LABELED.

RACEWAYS AND FITTINGS

RIGID METAL CONDUIT (RMC) AND INTERMEDIATE METALLIC CONDUIT (IMC) HEAVY WALL, GALVANIZED STEEL, SCHEDULE 40, THREADED. FITTINGS SHALL BE THREADED GALVANIZED OR CADMIUM PLATED STEEL FITTINGS. ELECTRIC METALLIC TUBING (EMT) SHALL BE GALVANIZED TUBING. FITTINGS: STEEL, RAIN TIGHT COMPRESSION TYPE WITH NYLON INSULATED THROATS ON CONNECTORS OUTDOOR OR 2" AND GREATER. STEEL SET-SCREW TYPE WITH NYLON INSULATED THROATS ON CONNECTORS UNDER 2" AND INDOOR. FLEXIBLE METAL CONDUIT SHALL BE FLEXIBLE, INTERLOCKED, GALVANIZED STEEL CONSTRUCTION, SPIRAL STRIP. FITTINGS AND CONDUIT BODIES: ANSI/NEMA FB 1. ALL STEEL, GALVANIZED, COMPRESSION TYPE. SPECIFICALLY DESIGNED FOR THE PURPOSE. LIQUID TIGHT FLEXIBLE CONDUIT SHALL BE FLEXIBLE, INTERLOCKED, GALVANIZED STEEL, SPIRAL STRIP WITH AN OUTER LIQUIDTIGHT, NON-METALLIC, SUNLIGHT-RESISTANT JACKET. FITTINGS: PLASTIC CONDUIT SHALL BE SCHEDULE 40 PVC MINIMUM, LISTED, SUNLIGHT RESISTANT, RATED FOR 90 DEGREES C CONDUCTORS.

ELECTRICAL BOXES

SHEET METAL OUTLET BOXES: GALVANIZED STEEL, WITH 3/8" MALE FIXTURE STUDS WHERE REQUIRED. LUMINAIRE AND EQUIPMENT SUPPORTING BOXES: RATED FOR WEIGHT FOR EQUIPMENT SUPPORTED.

PULL AND JUNCTION BOXES

OUTLET, PULL BOXES AND JUNCTION BOXES SHALL BE GALVANIZED STEEL MINIMUM 4 INCH SQUARE BY 2 1/8" INCHES DEEP FOR USE WITH 1 INCH CONDUIT AND SMALLER. ON CONDUIT SYSTEMS USING 1 1/4" OR LARGER, PULL AND JUNCTION BOXES SHALL BE SIZED PER NEC BUT NOT LESS THAN 4 11/16" SQUARE. OUTLET BOXES OUTDOORS SHALL BE CAST METAL WITH THREADED HUBS. PROVIDE DEVICE RINGS, SIZE AS REQUIRED.
FOR TELECOMMUNICATION, SECURITY, AND OTHER LOW VOLTAGE CABLE INSTALLATIONS, THE BOXES SHALL BE A 4 11/16" SQUARE BOX WITH SINGLE GANG MUDDING AND BLANK COVERPLATE.

WIRE AND CABLE

SINGLE CONDUCTOR, TYPE THHN/THWN OR XHHW INSULATION, RATED 600 VOLTS, SPLIT BOLT CONNECTORS ARE NOT ACCEPTABLE. NO CONDUCTOR LESS THAN 10 AWG SHALL BE INSTALLED IN EXTERIOR UNDERGROUND CONDUIT. ALL CONDUCTORS #1 AND SMALLER SHALL BE COPPER.

METAL-CLAD CABLE

METAL-CLAD CABLE SHALL BE TYPE MC PRE-MANUFACTURED CABLE ASSEMBLIES CONSISTING OF COLOR-CODED PHASE, NEUTRAL AND GROUND CONDUCTORS BOUND TOGETHER WITH AN OUTER COVERING OF METAL CLADDING. METAL-CLAD CABLE INSTALLED IN PATIENT VICINITY SHALL BE HEALTHCARE GRADE WITH REDUNDANT EQUIPMENT GROUND CONDUCTOR.

DEVICES

HUBBELL, PASS AND SEYMOUR, BRYANT, LEVITON, OR APPROVED EQUAL. ALL WIRING DEVICES SHALL COMPLY WITH NEMA STANDARD WD-1, "HEAVY DUTY WIRING DEVICES" AND UL 20 STANDARDS. COLOR SHALL BE IVORY.
A. 15A DUPLEX RECEPTACLE: HUBBELL 5252.
B. 20A DUPLEX RECEPTACLE: HUBBELL 5352.
C. GFCI RECEPTACLE: HUBBELL GF-5252.
D. SINGLE POLE SWITCH: HUBBELL 1221.

INSTALL WALL SWITCHES 48" TO CENTER ABOVE FLOOR. INSTALL CONVENIENCE RECEPTACLES 48" ABOVE FLOOR TO CENTER, 6" TO CENTER. INSTALL WITH GROUNDING PIN UP.

WALL PLATES

INDOOR DEVICES SHALL HAVE RAISED INDUSTRIAL COVERPLATES. OUTDOOR DEVICES SHALL HAVE GASKETED CAST METAL HINGED COVER.

SUPPORTING STRUCTURES

STEEL CHANNEL SUPPORTS: GALVANIZED OR PAINTED STEEL. DESIGN SUPPORTS TO CARRY WEIGHT OF EQUIPMENT AND CONDUIT, INCLUDE WIRING.

GROUNDING

PROVIDE AN INSULATED THROAT BUSHING ON THE CONDUIT PASSING THRU EACH METAL ENCLOSURE. PROVIDE A BONDING JUMPER CONNECTING THE BUSHING TO THE GROUND BUS AND METAL FRAME OF THE EQUIPMENT.
PROVIDE COPPER EQUIPMENT GROUNDING TERMINAL BAR IN ALL NEW PANELBOARDS. WHERE GROUNDING CONDUCTORS TERMINATE. BOND TO THE GROUNDING BUSHING ON THE CONDUIT FEEDING THE PANELBOARD.

ELECTRICAL DISTRIBUTION EQUIPMENT

PANELBOARDS, ENCLOSED SWITCHES AND MOTOR CONTROLLERS SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE UL STANDARD.
MANUFACTURERS: SQUARE D

DEMOLITION:

INACTIVE AND ABANDONED WIRE AND CABLE, INCLUDING DISCONNECTED CIRCUITS FROM WHICH ALL TERMINAL DEVICES HAVE BEEN ELIMINATED, SHALL BE REMOVED BACK TO THE SOURCE OF SUPPLY.
ABANDONED RACEWAY SHALL BE REMOVED.
COORDINATE DEMOLITION WITH THE WORK OF OTHER TRADES.
MATERIALS REMOVED DURING THE DEMOLITION PHASE OF THE WORK SHALL BE STORED OR PROPERLY DISPOSED OF AS DIRECTED BY THE OWNER.
PERFORM CUTTING, DRILLING AND PATCHING REQUIRED TO PERFORM THE WORK. PATCHING MATERIALS SHALL MATCH THE EXISTING MATERIALS.

LIGHTING

AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE. SECURELY MOUNT ALL FIXTURES, PROVIDE ALL ADDITIONAL HANGERS AND SUPPORTING BRACKETS AS NECESSARY TO SECURELY FASTEN AND SUPPORT FIXTURES.
DRIVERS SHALL BE AS RECOMMENDED BY THE FIXTURE MANUFACTURER. DRIVERS FOR LED FIXTURES SHALL BE LESS THAN 10% THD, UNLESS OTHERWISE NOTED.
LED DRIVER SHALL BE DIMMABLE FROM 100%TO 1% WITH 0-10 VDC CONTROL WITHOUT FLICKER.

LIGHTING CONTROLS

LIGHTING CONTROLS SYSTEM SHALL CONSIST OF LOCAL CONTROL STATIONS, OCCUPANCY SENSOR, DAYLIGHT SENSORS, AND INTERFACING DEVICES FOR A COMPLETE AND FULLY OPERATIONAL SYSTEM CONFORMING TO THE REQUIREMENTS OF THE APPLICABLE ENERGY CODE.
LIGHTING CONTROL MANUFACTURER SHALL BE nLIGHT. OCCUPANCY SENSOR: nCM SERIES. PHOTOCELL SENSOR: nCMB SERIES

FIRE ALARM

FIRE ALARM PRODUCTS SHALL MATCH EXISTING BUILDING DEVICES AND SHALL BE AN EXTENSION OF THE EXISTING BUILDING SYSTEM. EXISTING BUILDING SYSTEM IS SILENT KNIGHT.

TELECOM

COMMUNICATION DEVICES SHALL BE INSTALLED ACCORDING TO THE LATEST VERSION OF THE UI OIT STANDARDS.
COMMUNICATION CABLING TO BE INSTALLED ACCORDING TO UI STRUCTURED CABLING STANDARD.

SECURITY SYMBOLS

- CARD READER
- DOOR INTERLOCK
- DOOR POSITION INDICATION SWITCH (INTERRUPTIBLE)
- DOOR POSITION INDICATION SWITCH (UNINTERRUPTIBLE)
- DURESS ALARM (WITH LIGHT)
- DURESS ALARM (WITHOUT LIGHT)
- ELECTRIC LOCK
- ELECTRIC LOCK (DEADBOLT)
- KEYED SWITCH
- MOTION DETECTOR
- PUSH BUTTON REX
- SECURITY CAMERA (STANDARD)
- SECURITY CONTROL PANEL
- SENSOR REX
- KEYPAD
- VSS MONITOR
- WINDOW BREAKAGE DETECTOR

SCHEMATIC SYMBOLS

- AMP METER
- AUTOMATIC TRANSFER SWITCH
- AUTOMATIC TRANSFER SWITCH (4-POLE BYPASS ISOLATION)
- CIRCUIT BREAKER
- CIRCUIT BREAKER (GFI)
- INDICATES A BREAKER WITH A 1600 AMP FRAME AND A 1200 AMP TRIP SETTING
- CONTACT (N.C.)
- CONTACT (N.O.)
- CONTACT (REMOTE, N.C.)
- CONTACT (REMOTE, N.O.)
- DISCONNECT SWITCH
- ELECTRONIC INTERLOCK
- ENCLOSED CIRCUIT BREAKER
- FEEDER IDENTIFICATION
- FUSE
- FUSIBLE SWITCH
- GENERATOR
- GROUND
- GROUNDED WYE
- INDUCTOR
- LINE TAP
- METER
- MOTOR
- PANELBOARD (# INDICATES NAME)
- PANEL OR CABINET
- SEPARABLE CONNECTIONS
- SPACE IN PANELBOARD
- SWITCH
- SURGE PROTECTION DEVICE
- TRANSFORMER
- VOLT METER

GENERAL SYMBOLS

- KEY NOTE
- EQUIPMENT IDENTIFIER
- DETAIL NUMBER / DETAIL REFERENCE / SHEET NUMBER
- DETAIL NUMBER / DETAIL REFERENCE / MATCHED SHEET NUMBER / CURRENT SHEET NUMBER
- MATCH LINE REFERENCE / MATCHED SHEET NUMBER
- ROOM NAME AND NUMBER
- CONNECTION TO EXISTING (# INDICATES EXISTING SIZE)
- REVISION NUMBER
- SECTION NUMBER / SECTION REFERENCE / SHEET NUMBER
- NORTH ARROW
- CENTER LINE

NOTE:
SYMBOLS AND ABBREVIATIONS ON THE DRAWINGS SHALL BE INTERPRETED IN ACCORDANCE WITH THE LEGENDS WHEREVER APPLICABLE. NOT ALL SYMBOLS AND ABBREVIATIONS IN THE LEGENDS ARE NECESSARILY USED FOR THE PROJECT. ALL SIZES ARE IN INCHES, UNLESS OTHERWISE NOTED.

LINEWEIGHT LEGEND

- NEW WORK
- EXISTING TO REMAIN OR NOT IN CONTRACT
- DEMOLITION
- FUTURE WORK

FIRE ALARM SYMBOLS

- DOOR HOLD OPEN
- DUCT SMOKE DETECTOR
- FIRE ALARM CONTROL PANEL
- FIRE ALARM ANNUNCIATOR PANEL
- FIRE ALARM SLAVE PANEL
- FIRE BELL
- FLOW SWITCH
- HEAT DETECTOR (CEILING MOUNTED)
- HEAT DETECTOR (WALL MOUNTED)
- HORN (WALL MOUNTED)
- HORN (CEILING MOUNTED)
- MANUAL PULL STATION
- MICROPHONE
- MONITOR MODULE
- OSID BEAM. SEE FLOOR PLANS FOR MOUNTING HEIGHT. OSID-R INDICATES REFLECTOR
- OUTPUT RELAY
- SMOKE DETECTOR (CEILING MOUNTED)
- SMOKE DETECTOR (WALL MOUNTED)
- SPEAKER (WALL MOUNTED)
- SPEAKER (CEILING MOUNTED)
- SPEAKER STROBE (WALL MOUNTED)
- SPEAKER STROBE (CEILING MOUNTED)
- STROBE (WALL MOUNTED)
- STROBE (CEILING MOUNTED)
- TAMPER DETECTOR (WITH VALVE)
- TAMPER DETECTOR (WITHOUT VALVE)

ADDENDUM 2:

2.2 Question: Clarify spec for electrical panel in the bench. Demo/construction
Response: Demolish existing load center back to source. Demolish associated conduits and breakers.

2.5 Question: There was a request for the specification (make/model) for the raceway above the cabinets in room 207. Will it be the 4000 series, like they have put in on other projects at the university.
Response: Match University of Idaho Standards. 4000 series is acceptable.

2.9 Question: Are the panels in the corridor included in base bid?
Response: Yes, panels L2B and L2C are to be included in the base bid.

2.14 Question: Does the existing building Fire Alarm FACP have the capacity to expand to accept the Initiation and Notification devices being added during this renovation?
Does the Existing building Fire Alarm FACP have sufficient Standby Battery power to accept the additional devices being added?
Are the existing Fire Alarm plans available and could we get a copy.
Response: The existing panel has capacity for the proposed scope. Existing plans, if available, will be provided to the selected contractor.

ADDENDUM 3:

3.1 Question: Reference ED2-11 room 207 plans show to demo receptacles on north and west walls. Sheet E2-11 shows installing surface mount raceway with devices. At the walk through it was discussed that they thought the existing devices were just needed to be replaced – please clarify.
Response: Remove existing devices and replace with new devices above counter. No need for new surface mount raceway if the counter is not being demolished.

3.2 Question: Who is responsible for data cabling? U of I, System Tech or others?
Response: The UI OIT Department.

3.3 Question: Is there a telecom closet on the 2nd floor for cabling to terminate in or do all cable run to the basement?
Response: As far as we are aware, there is not a second-floor telecom room. All cables run down to the first-floor telecom rack from the second-floor janitors' closet.

3.4 Question: Reference T8-01 shows raceway from basement to 2nd floor. Does this raceway go straight up, or does it offset somewhere? Need floor details as to where conduit is to be placed.
Response: Conduit goes straight up from the telecom rack on the first floor. See sheet E4-01 for more information.

3.5 Question: U of I standards are for stub up for data to accessible ceiling. All ceilings in these locations have a hard ceiling and the only access is a small access hatch above and a lab below. If we go up, where do we terminate the conduits? If we go down, where do we terminate?
Response: There is a 3-foot attic space above the hard lid to terminate the conduits.

3.6 Question: Sheet E0-01 says metal clad conduit is acceptable. Typical U of I specs states for whips only.
Response: That is correct. Per UI Standards MC cable is only allowed for lighting whips.

3.7 Question: When at the walk through, we were shown (1) access hatch. Is that the only one? It is small. Do we know the height of space above ceiling?
Response: As far as we are aware, that is the only access hatch. The space above the hard lid is an attic approximately 3 feet of clear space.

3.8 Question: Are all additional wiring devices to be installed in wire mold or is EMT acceptable?
Response: EMT is acceptable for additional wiring devices. Per UI standards, all conduit to be 3/4" or greater.

3.9 Question: Reference EL5-02 plans show a complete lighting system. Is this what is to be installed? Is there an existing system in the building that we tie into?
Response: The detail on sheet EL5-02 is a typical detail. The new lights are to be integrated into the existing system.

POWER SYMBOLS

- CONDUIT DROP
- CONDUIT RISE
- DISCONNECT SWITCH
- DISTRIBUTION PANEL
- ELECTRICAL PANEL
- JUNCTION BOX
- METER
- MOTOR
- MOTOR STARTER
- MOTOR STARTER (MANUAL)
- PUSH TYPE SWITCH
- RECEPTACLE, 20 AMP DUPLEX
- RECEPTACLE, CEILING MOUNTED
- RECEPTACLE, CEILING 20 AMP DUPLEX
- RECEPTACLE, CEILING DUPLEX STANDBY POWER
- RECEPTACLE, CEILING DUPLEX UPS BACKED
- EQUIPMENT TAG. REFER TO EQUIPMENT SHEDULE SHEET FOR DETAILS.
- RECEPTACLE, DUPLEX
- RECEPTACLE, DUPLEX FLOOR MOUNTED
- RECEPTACLE, DUPLEX GFI
- RECEPTACLE, DUPLEX ISOLATED GROUND
- RECEPTACLE, DUPLEX SWITCHED
- RECEPTACLE, DUPLEX STANDBY POWER
- RECEPTACLE, DUPLEX UPS BACKED
- RECEPTACLE, DUPLEX WITH USB
- RECEPTACLE, QUAD
- RECEPTACLE, QUAD FLOOR MOUNTED
- RECEPTACLE, FLOORBOX. "X" INDICATES THE QUANTITY OF DUPLEX OUTLETS TO BE INSTALLED. "Y" INDICATES THE FLOORBOX TYPE. REFER TO SHEET EXXX FOR DETAILS ON EACH TYPE.
- RECEPTACLE, SINGLE
- RECEPTACLE, SPECIAL
- RECEPTACLE, SPECIAL FLOOR MOUNTED
- TRANSFORMER
- CONCEALED CONDUIT- UNLESS OTHERWISE INDICATED, DENOTES 3/4"C-2#12+1#12G
- SURFACE MOUNTED RACEWAY

LIGHTING SYMBOLS

- 1'x4' LIGHT
- 2'x2' LIGHT
- 2'x4' LIGHT
- DOWNLIGHT
- EXIT LIGHT
- PENDANT LIGHT
- POLE MOUNTED LIGHT
- STRIP LIGHT
- TRACK LIGHT
- WALL MOUNTED EMERGENCY LIGHT
- WALL SCONCE
- WALL WASHER
- LIGHT FIXTURE WITH LOWER CASE LETTER INDICATING ZONING FOR LIGHTING CONTROLS
- CRITICAL POWER LIGHT
- EMERGENCY POWER LIGHT
- DAYLIGHT SENSOR
- VACANCY SENSOR
- OCCUPANCY SENSOR
- PHOTOCELL SENSOR
- PRIMARY DAYLIGHT ZONE
- SECONDARY DAYLIGHT ZONE
- LIGHTING SWITCH (STANDARD)
- LIGHTING SWITCH (3-WAY)
- LIGHTING SWITCH (4-WAY)
- LOW VOLTAGE LIGHTING SWITCH DETAILS - SHOWN ON LOW VOLTAGE LIGHTING DETAIL SHEET
- LIGHTING CONTROL PANEL

ABBREVIATIONS

Ø	DIAMETER
ABV	ABOVE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AL	ALUMINUM
AR	AS REQUIRED
ATS	AUTOMATIC TRANSFER SWITCH
BLDG	BUILDING
C	CONDUIT
CCT	CIRCUIT
CKT	CIRCUIT
CLG	CEILING
CO	CONDUIT ONLY WITH 1/4" POLYPROPYLENE PULL ROPE
CP	CHROME PLATED
CT	CURRENT TRANSFORMER
CU	COPPER
DIA	DIAMETER
DISC	DISCONNECT
DIST	DISTRIBUTION
DIV	DIVISION
DWG	DRAWING
DX	DUPLEX
(E)	EXISTING TO REMAIN
EA	EACH
EM	EMERGENCY
FLR	FLOOR, OR FLOOR MOUNTED
FT	FEET
G	GROUND
GA	GAUGE
GFI	GROUND FAULT INTERRUPT
GND	GROUND
H	HIGH
HT	HEIGHT
IG	ISOLATED GROUND
IN	INCHES
L	LONG
LI	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME AND INSTANTANEOUS TRIP CHARACTERISTICS
LSI	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME, SHORT TIME AND INSTANTANEOUS TRIP CHARACTERISTICS
LSIA	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT ALARM TRIP CHARACTERISTICS
LSIG	INDICATES A BREAKER WITH FULLY ADJUSTABLE LONG TIME, SHORT TIME, INSTANTANEOUS AND GROUND FAULT TRIP CHARACTERISTICS
MAX	MAXIMUM
MFR	MANUFACTURER
MIN	MINIMUM
MMS	MANUAL MOTOR STARTER
MNT	MOUNT(ED)
(N)	NEW
N	NEUTRAL
NL	NIGHT LIGHT
N.C.	NORMALLY CLOSED
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
NORM	NORMAL
UNO	UNLESS NOTED OTHERWISE
PNL	PANEL
QIG	QUAD ISOLATED GROUND
REQ'D	REQUIRED
RM	ROOM
SIM	SIMILAR
SMR	SURFACE METAL RACEWAY
SPST	SINGLE POLE/SINGLE THROW SWITCH
SS	STAINLESS STEEL
SW	SWITCH
T	TAMPER PROOF RECEPTACLE
TYP	TYPICAL
W	WIDE
W/	WITH
W/IN	WITHIN
W/O	WITHOUT
WP	WEATHERPROOF. RECEPTACLES TO BE GFI
X	EXISTING DEVICE TO BE REPLACED WITH NEW DEVICE AT SAME LOCATION
XFMR	TRANSFORMER

ANNOTATION

+XX" MOUNTING HEIGHT (AFF OR AFG)
(n)x"C-a#b+c#d
n = QUANTITY OF CONDUIT
x = SIZE OF CONDUIT
a = QUANTITY OF CONDUCTORS
b = CONDUCTOR WIRE SIZE
c = QUANTITY OF GROUND
d = GROUND WIRE SIZE

KNIT
knitstudios.com

MW Engineers
601 W. First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: LEGENDS & ABBREVIATIONS - ELECTRICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

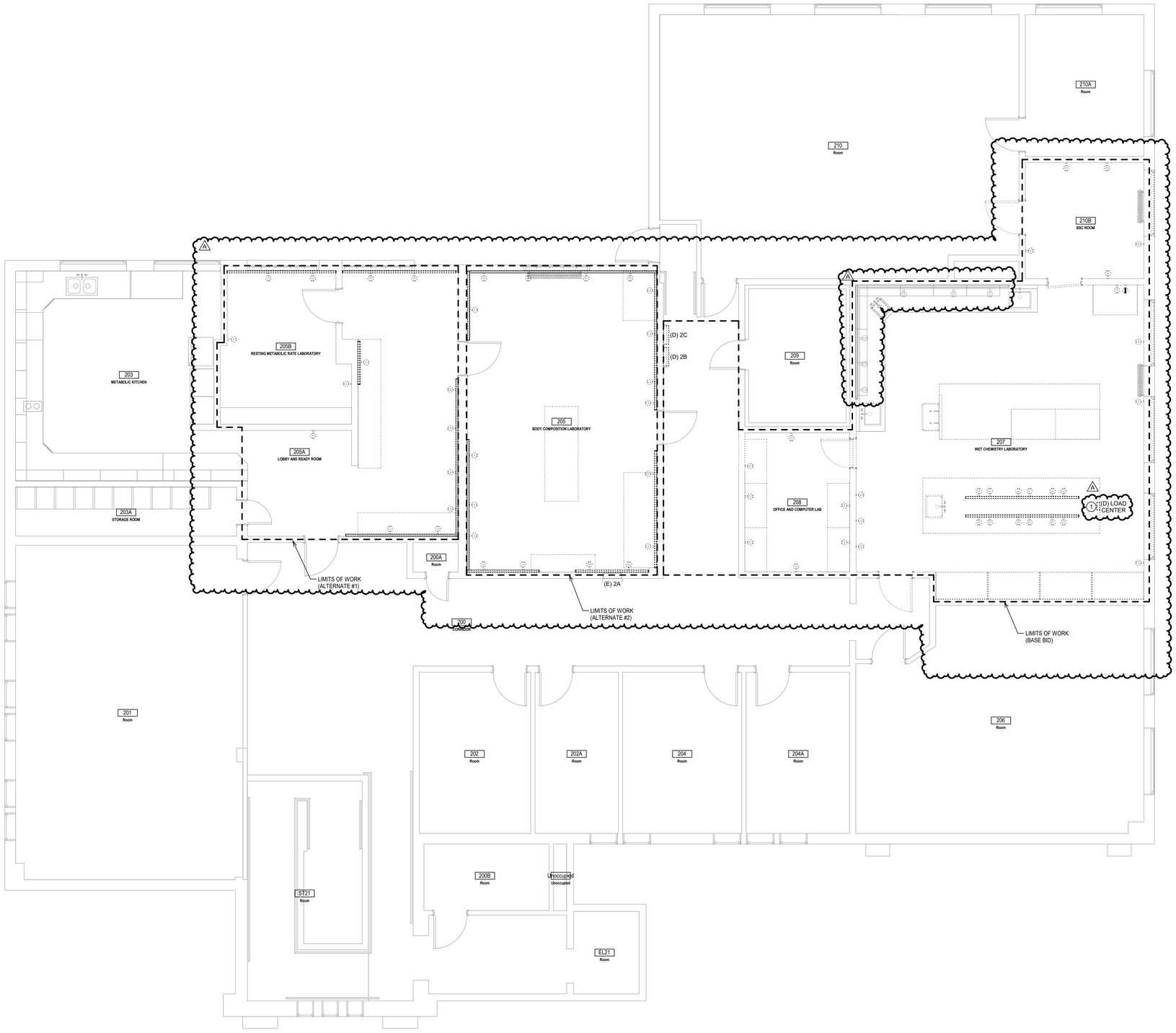
E0-01

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.

KEY NOTES:

1. DEMOLISH EXISTING LOAD CENTER BACK TO SOURCE. DEMOLISH ASSOCIATED CIRCUITS AND BREAKERS.



LEVEL 2 - DEMOLITION PLAN - ELECTRICAL

1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.0029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: DEMO FLOOR PLAN - ELECTRICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE. MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

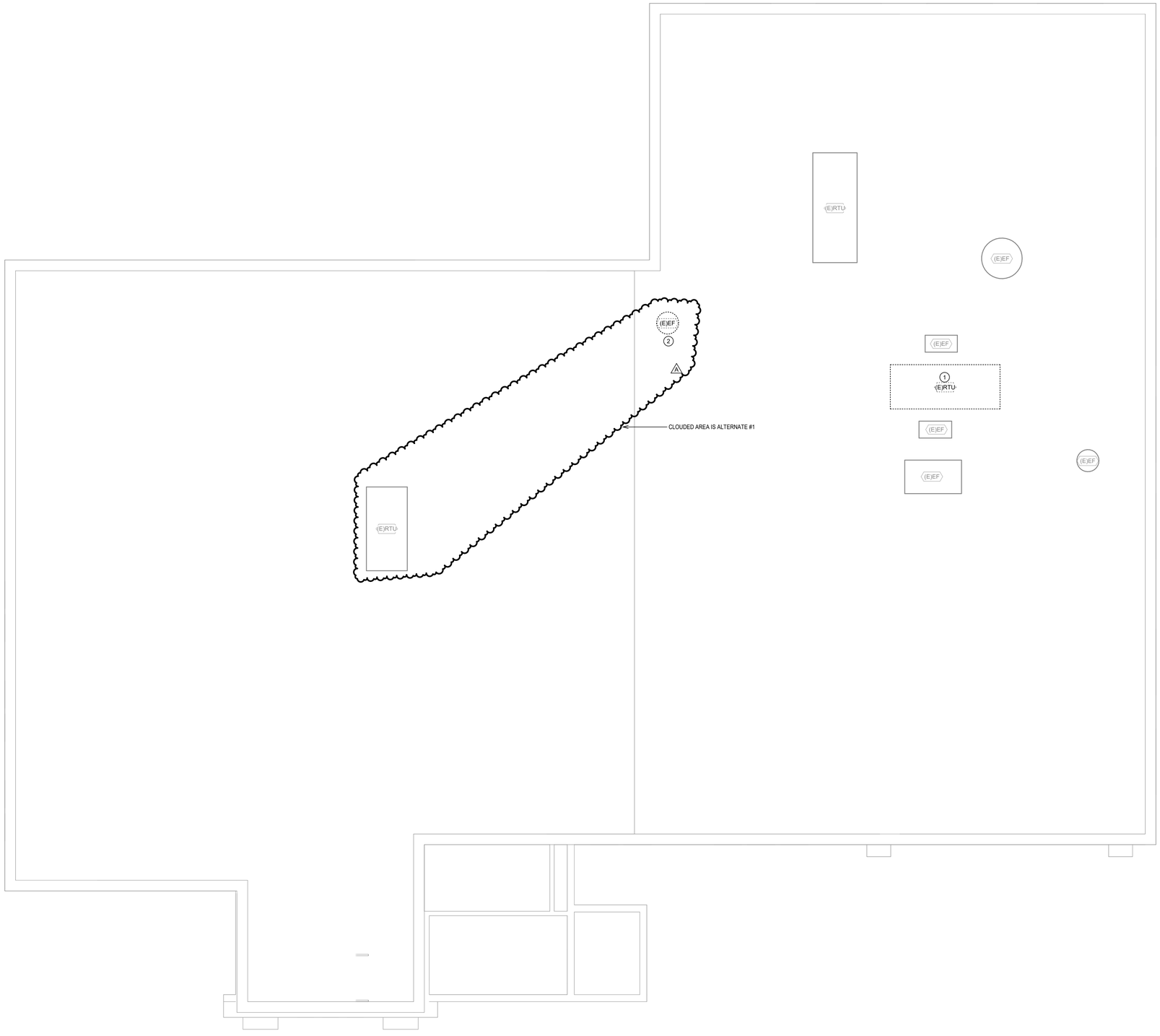
ED2-11

GENERAL NOTES:

1. MAKE SAFE ELECTRICAL CONNECTIONS TO EXISTING MECHANICAL EQUIPMENT BEING DEMOLISHED. REMOVE EXISTING BRANCH CIRCUIT CONDUCTORS TO NEAREST JUNCTION BOX OR RETAINED STRUCTURE AND PROTECT FOR REUSE. INTERCEPT AND MODIFY EXISTING RACEWAY SYSTEM AS REQUIRED TO ACCOMMODATE DEMOLITION OF EXISTING MECHANICAL EQUIPMENT AND CONNECTION OF NEW MECHANICAL EQUIPMENT. EXTEND BRANCH CIRCUIT CONDUCTORS AND MAKE FINAL CONNECTIONS. COORDINATE WITH DIV. 23 PRIOR TO COMMENCING WORK. SEE MECHANICAL DRAWINGS FOR ADDITIONAL DETAILS.
2. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.

KEYNOTES:

1. DEMOLISH EXISTING EQUIPMENT AND REPLACE WITH NEW AS INDICATED.
2. DEMOLISH EXISTING EQUIPMENT.



DEMO ROOF PLAN - ELECTRICAL

1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: DEMO ROOF PLAN - ELECTRICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

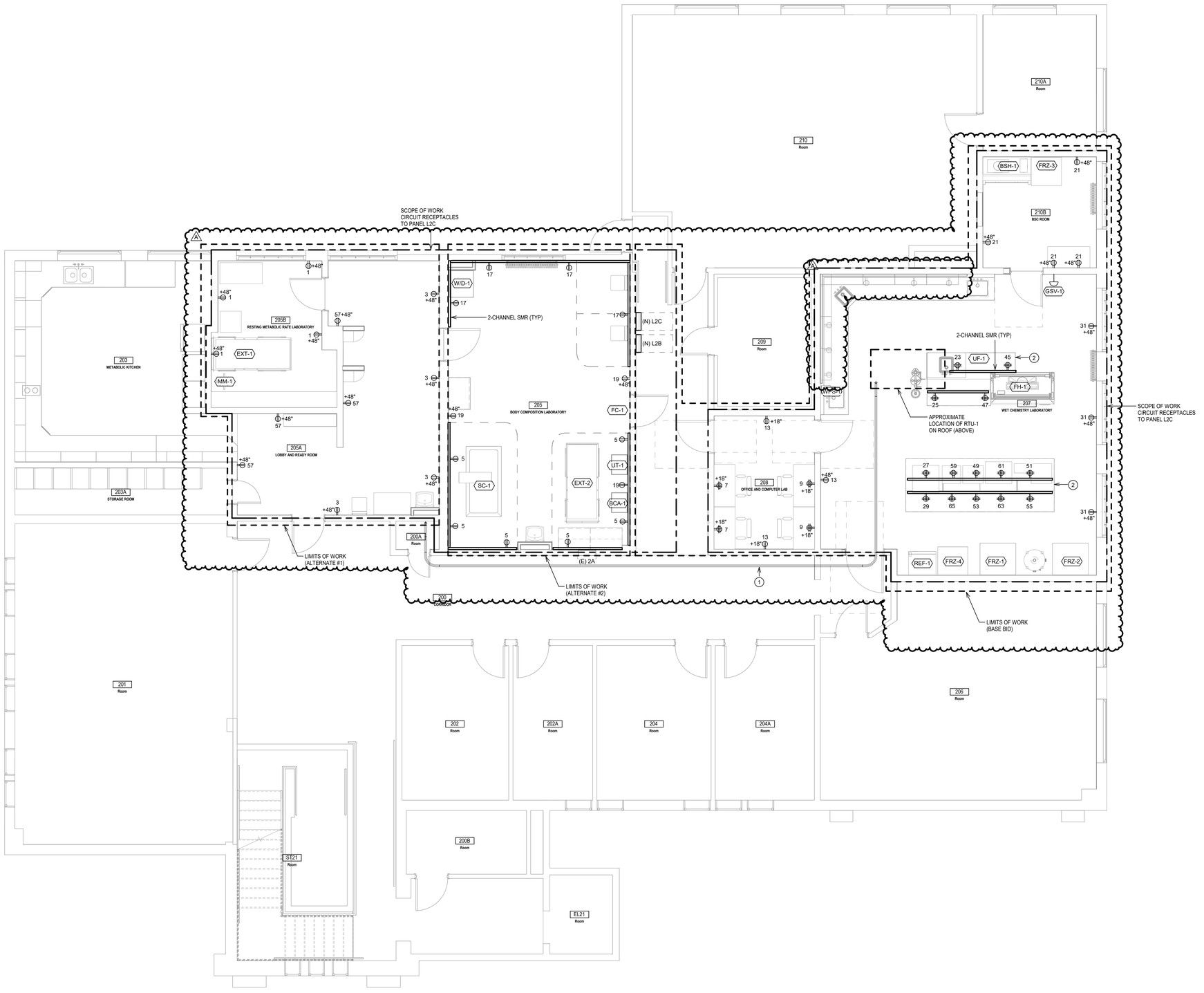
ED2-12

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
2. LAB RECEPTACLES ARE TO BE GFCI PROTECTED. SEE PANEL SCHEDULES FOR MORE DETAILS.

KEYNOTES:

1. PROPOSED ROUTING OF FEEDER CONDUIT FOR RTU-1 TO PANEL M.
2. ISLAND RECEPTACLES FEED FROM LEVEL 1 CEILING BELOW.



LEVEL 2 - ELECTRICAL

1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9020
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: FLOOR PLAN - ELECTRICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

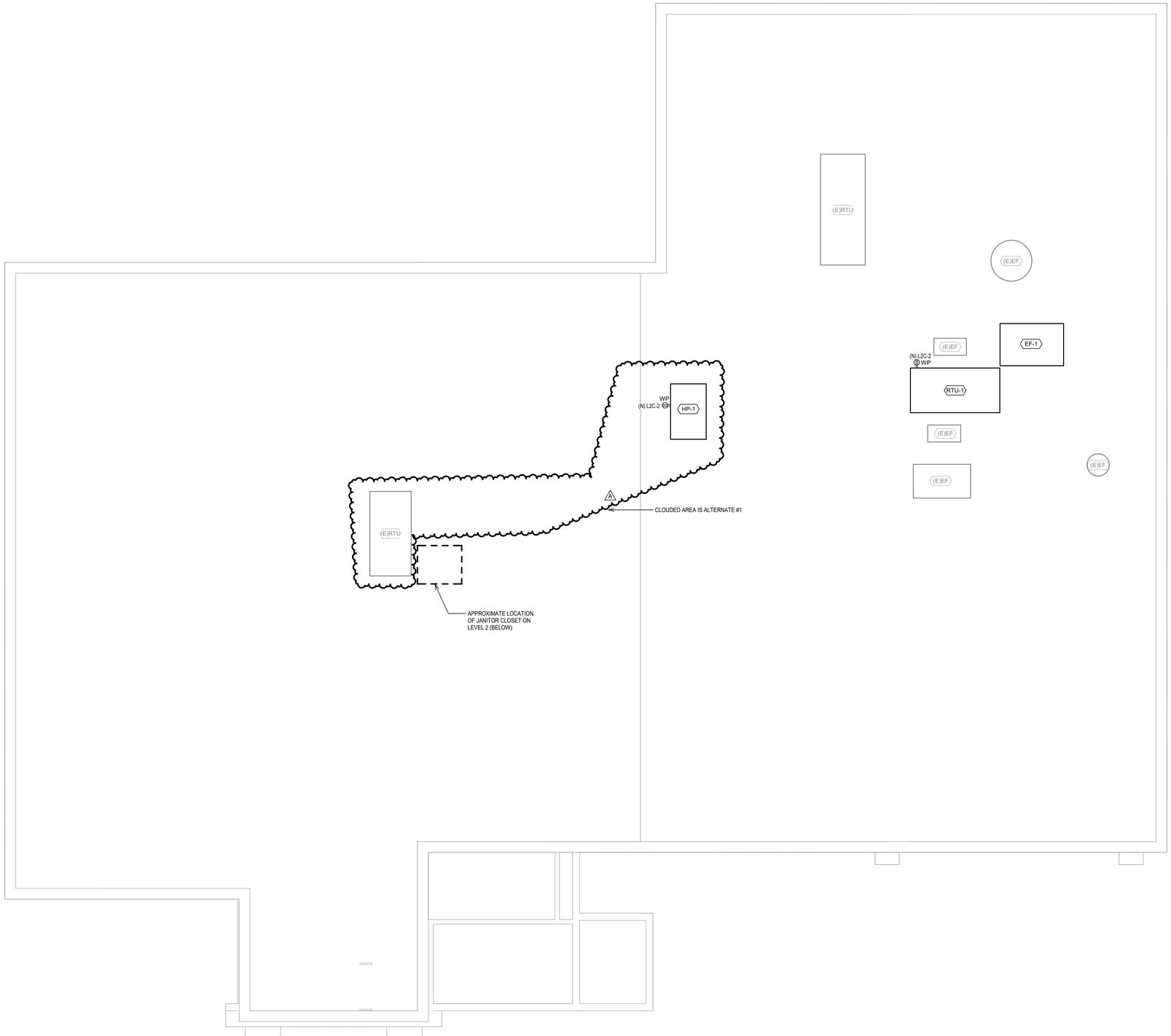
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

E2-11

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



ROOF PLAN - ELECTRICAL

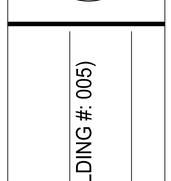
1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.0029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions



TITLE: ROOF PLAN - ELECTRICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE. MOSCOW, ID 83844

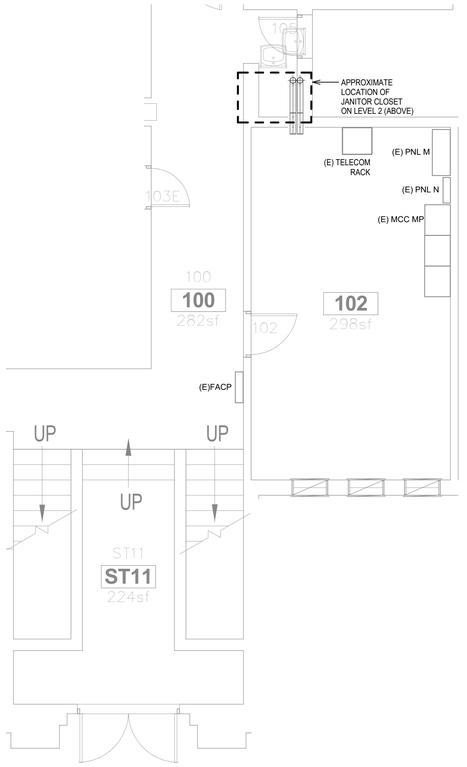
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

E2-12

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



LEVEL 1 - MECH ROOM 102 - ELECTRICAL
1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.0029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: ENLARGED VIEWS - ELECTRICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

E4-01

MECHANICAL EQUIPMENT SCHEDULE - ELECTRICAL

GENERAL NOTES:
1. COORDINATE CONNECTION DETAILS WITH EQUIPMENT VENDOR PRIOR TO ROUGH-IN.
2. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL DETAILS AND REQUIREMENTS.
3. PROVIDE NEMA 3R RATED EQUIPMENT WHERE INSTALLED OUTDOORS.
4. COORDINATE ALL FUSE SIZES WITH EQUIPMENT VENDOR, EQUIPMENT NAMEPLATES AND SHOP DRAWINGS PRIOR TO ORDERING FUSES OR DISCONNECTS.
5. PROVIDE NEMA STARTER WHERE INDICATED ON THE SCHEDULE. PROVIDE AT MINIMUM THE SIZE INDICATED.
6. WIRE SIZES ARE FOR COPPER CONDUCTORS UNLESS SPECIFICALLY INDICATED OTHERWISE.
7. WHERE TOGGLE SWITCHES, MANUAL MOTOR STARTERS(MMS) AND MOTOR RATED SWITCHES(MRS) ARE INDICATED FOR EQUIPMENT INSTALLED IN FINISHED AREAS, THEY SHALL BE MOUNTED IN AN ADJACENT, CONCEALED AND ACCESSIBLE LOCATION.

EQUIPMENT SPECIFIC NOTES:
1. OUTDOOR CONDENSING UNIT CIRCUIT POWERS OUTDOOR UNIT AND INDOOR UNIT. SEE MECHANICAL DRAWINGS FOR DETAILS. CIRCUIT SHALL BE STRANDED WIRE.
2. EQUIPMENT BRANCH CIRCUIT IS OVERSIZED TO ACCOUNT FOR VOLTAGE DROP.
3. EQUIPMENT INDICATED WITH '0' AMPS LOAD IS REDUNDANT AND WILL NOT OPERATE SIMULTANEOUSLY WITH ITS COUNTERPART. SEE MECHANICAL SCHEDULES FOR DETAILS.
4. EQUIPMENT IS FURNISHED WITH INTEGRAL THERMAL OVERLOAD PROTECTION FOR THE MOTOR.
5. VFD IS EQUIPPED WITH BYPASS, CIRCUIT BREAKER SIZED ACCORDINGLY.
6. CIRCUIT BREAKER IN PANEL SHALL HAVE NECESSARY HARDWARE TO FACILITATE LOCK-OUT, TAG-OUT OF BREAKER....

DENOTED ITEMS ALTERATE #1 →

	Equipment Name	Description	Room #	Voltage	Phase	HP	Amps	kVA	Starter	Disconnect	Fuse Size	# of Sets	Conduit Size	Wire Size/Qty (AWG)	Panel	Circuit Number	Notes
	BSH-1	BIOSAFTY HOOD		120 V	1	--	8 A	0.960 kVA	--	HARDWIRED	--	1	3/4"	2#12+1#12G	(N) L2C	11	
	EF-1	EXHAUST FAN		208 V	1	.33	4 A	0.832 kVA	--	TOGGLE SWITCH	--	1	3/4"	2#12+1#12G	(N) L2C	44,46	
ALT #1	FC-1	FAN COIL	205	208 V	1	--	0 A	0.000 kVA	--	TOGGLE SWITCH	--	1	3/4"	2#12+1#12G	(N) L2C	14,16	1
ALT #1	FH-1	FUME HOOD	207	120 V	1	--	10 A	1.200 kVA	--	HARDWIRED	--	1	3/4"	2#12+1#12G	(N) L2C	33	
	GSV-1	GAS SHUT OFF	207	120 V	1	--	1 A	0.120 kVA	--	HARDWIRED	--	1	3/4"	2#12+1#12G	(N) L2C	38	
ALT #1	HP-1	HEAT PUMP		208 V	1	--	18.3 A	3.806 kVA	--	2P-30A	20A	1	3/4"	2#10+1#10G	(N) L2C	4,6	1
A	RTU-1	ROOF TOP UNIT		208 V	3	2.3	69.3 A	24.966 kVA	--	3P-100A	70A	1	1 1/4"	3#4+1#8G	(E) PANEL M	8,10,12	7

GENERAL EQUIPMENT SCHEDULE - ELECTRICAL

EQUIPMENT SPECIFIC NOTES:
1. INDICATED HEIGHTS ARE FOR REFERENCE ONLY. REFER TO AV AND ARCHITECTURAL DRAWINGS FOR FINAL EQUIPMENT HEIGHTS AND LOCATIONS.
2. DIVISION 26 SHALL PROVIDE AND INSTALL ELECTRICAL PROVISIONS AS SCHEDULED.

A

DENOTED ITEMS ALTERATE #1 →

	Equipment Name	Description	Room #	Voltage	Phase	HP	Amps	kVA	Starter	Disconnect	Fuse Size	# of Sets	Conduit Size	Wire Size/Qty (AWG)	Panel	Circuit Number	Notes
ALT #1	BCA-1	BODY COMPOSITION ANALYZER	205	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	18	
ALT #1	EXT-1	EXAM TABLE	205B	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	20	
ALT #1	EXT-2	EXAM TABLE	205	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	28	
	FRZ-1	FREEZER (-80)	207	208 V	1	--	10 A	2.080 kVA	--	NEMA 6-20R	--	1	3/4"	2#12+1#12G	(N) L2C	41,43	
	FRZ-2	FREEZER (-80)	207	208 V	1	--	10 A	2.080 kVA	--	NEMA 6-20R	--	1	3/4"	2#12+1#12G	(N) L2C	40,42	
	FRZ-3	FREEZER (-20)		120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	39	
	FRZ-4	FREEZER (-20)	207	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	37	
ALT #1	MM-1	METABOLIC MONITOR	205B	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	22	
	REF-1	REFRIGERATOR	207	120 V	1	--	2.2 A	0.264 kVA	--	NEMA 5-15R	--	1	3/4"	2#12+1#12G	(N) L2C	35	
ALT #1	SC-1	SCANNER	205	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	24	
	UF-1	UNDERCOUNTER FLASKSCRUBBER	207	208 V	3	--	20 A	7.205 kVA	--	NEMA 11-30R	--	1	3/4"	3#10+1#10G	(N) L2C	32,34,36	
ALT #1	UT-1	ULTRASOUND	205	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	26	
ALT #1	WD-1	WASHER/DRYER	205	208 V	1	--	10 A	2.080 kVA	--	NEMA 6-20R	--	1	3/4"	2#12+1#12G	(N) L2C	8,10	
	WPS-1	WATER PURIFICATION SYSTEM	207	120 V	1	--	5 A	0.600 kVA	--	NEMA 5-20R	--	1	3/4"	2#12+1#12G	(N) L2C	30	

LIGHTING FIXTURE SCHEDULE

Type	Description	Lamp	VA	Voltage	Manufacturer	Model #	Keynote
B	2X4 RECESSED TROFFER	LED	39 VA	120 V	CORONET	SRP24-35-LW-G-ED1-U	
B2	2x2 RECESSED TROFFER	LED	23 VA	120 V	COLUMBIA	SRP22-358-LW-G-ED1	
BE	2X4 RECESSED TROFFER - EMERGENCY	LED	39 VA	120 V	CORONET	SRP24-35-LW-G-ED1-U-ELL14	
E1	LED EXIT FIXTURE	LED	4 VA	120 V	BARRON	700U-LB-WH	
Indirect Light Source		LED	0 VA				
P4	LINEAR DIRECT/INDIRECT PENDANT	LED	40 VA	120 V	CORONET	RAY4-UPDN-4-35-LOW-LOW-UNV-DB-W-AC-SD-NA-NA-STD	
P4A	LINEAR DIRECT/INDIRECT PENDANT	LED	40 VA	120 V	CORONET	RAY4-UPDN-4-35-MED-MED-UNV-DB-W-AC-SD-NA-NA-STD	
P4AE	LINEAR DIRECT/INDIRECT PENDANT	LED	40 VA	120 V	CORONET	RAY4-UPDN-4-35-MED-MED-UNV-DB-W-AC-SD-NA-EMPCK-STD	
P8	LINEAR DIRECT/INDIRECT PENDANT	LED	80 VA	120 V	CORONET	RAY4-UPDN-8-35-LOW-LOW-UNV-DB-W-AC-SD-NA-NA-STD	
P8E	LINEAR DIRECT/INDIRECT PENDANT - EMERGENCY	LED	80 VA	120 V	CORONET	RAY4-UPDN-8-35-LOW-LOW-UNV-DB-W-AC-SD-NA-EMPCK-STD	
Suspended							

KNIT
knitstudios.com

MW Engineers
601 W 1st Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: SCHEDULES - ELECTRICAL
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

E6-01

Existing Main Switchboard Load Summary *(loads shown in kVA)*

Description	Receptacles	Lights	Welders	X-Ray Machines	Kitchen Appliances	Motors	Largest Motor	Miscellaneous	Connected Line Total
Panel M	45.2	9.9				68.7	**30.6**	64.5	71.2
Connected Total	45.2	9.9				68.7	**n/a**	64.5	71.2
Demand Total	27.6	9.9				68.7	**n/a**	64.5	170.7
Total Load (w/heating factors)	27.6	12.3				68.7	7.7	64.5	180.8

Existing Maximum Demand	109.0
Demand Total	279.7
Total Load (w/heating factor for existing)	317.1
Minimum Amperage Required	**880 Amps**

Totals including existing loads (if any)

*Formula: (180.8 kVA+109.0 kVA*1.25)/(1.732*0.208 kV)*

Notes: 1. Existing 1-year peak demand of 98kW/109kVA recorded in June 2016.

Circuit Breaker Panelboard

Name: **(E) Panel M** | Mounting: **Surface**
Main: **Lugs** | Bus: **600A**
Volts: **120/208** | Bracing: **10,000**
Phase: **3** Wire: **4**

Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)	Ph A	Ph B	Ph C	Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)
1	225	3			1	Existing		×			2	100	3			1	Existing	
3						"			×		4						"	
5						"				×	6						"	
7	225	3			1	Existing		×			8	100	3	1	M	1	Elevator	6240
9						"			×		10						"	6240
11						"				×	12						"	6240
13	225	3			1	Existing		×			14	20	1				Spare	
15						"			×		16	20	1				Spare	
17						"				×	18	20	1				Spare	
19	70	3	1	M	2	(N) RTU-1	10208	×			20	20	1				Spare	
21						"	10208		×		22	20	1				Spare	
23						"	10208			×	24	20	1				Spare	
25	225	3			1	Existing		×			26	20	1				Spare	
27						"			×		28	20	1				Spare	
29						"				×	30	20	1				Spare	
31	20	1				Spare		×			32	20	1				Spare	
33	20	1				Spare			×		34	20	1				Spare	
35	20	1				Spare				×	36	20	1				Spare	
37	20	1				Spare		×			38					1	Existing	
39	20	1				Spare			×		40						"	
41	20	1				Spare				×	42						"	

Totals

		Category	Qty	Load
Load on Phase A:	14,369 VA	Receptacles (R):	186	33,480 VA
Load on Phase B:	14,299 VA	Lights (L):	94	8,150 VA
Load on Phase C:	11,870 VA			
Connected Load:	**40,538 VA**			
Demand Load:	**133,398 VA**			
Total Load (w/heating factors):	**140,116 VA**			
Minimum Feeder Size:	**388.9 Amps**	Motors (M):	16	36,108 VA
Formula:	*140.1 kVA /(1.732*0.208 kV)*	Miscellaneous (Z):	33	67,400 VA

Notes:
1. EXISTING TO REMAIN
2. DEMOLISH EXISTING SPARE BREAKERS. REPLACE WITH NEW 3P-70A BREAKER AS SHOWN.

Circuit Breaker Panelboard

Name: **(R) Panel M** | Mounting: **Surface**
Main: **Lugs** | Bus: **600A**
Volts: **120/208** | Bracing: **10,000**
Phase: **3** Wire: **4**

Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)	Ph A	Ph B	Ph C	Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)
1	225	3			1	Existing		×			2	100	3			1	Existing	
3						"			×		4						"	
5						"				×	6						"	
7	225	3			1	Existing		×			8	100	3	1	M	1	Elevator	6240
9						"			×		10						"	6240
11						"				×	12						"	6240
13	225	3			1	Existing		×			14	20	1				Spare	
15						"			×		16	20	1				Spare	
17						"				×	18	20	1				Spare	
19	70	3	1	M	2	(N) RTU-1	10208	×			20	20	1				Spare	
21						"	10208		×		22	20	1				Spare	
23						"	10208			×	24	20	1				Spare	
25	225	3			1	Existing		×			26	20	1				Spare	
27						"			×		28	20	1				Spare	
29						"				×	30	20	1				Spare	
31	20	1				Spare		×			32	20	1				Spare	
33	20	1				Spare			×		34	20	1				Spare	
35	20	1				Spare				×	36	20	1				Spare	
37	20	1				Spare		×			38	225	3			1	Existing	
39	20	1				Spare			×		40						"	
41	20	1				Spare				×	42						"	

Totals

		Category	Qty	Load
Load on Phase A:	24,377 VA	Receptacles (R):	242	43,560 VA
Load on Phase B:	24,507 VA	Lights (L):	126	9,857 VA
Load on Phase C:	22,078 VA			
Connected Load:	**71,162 VA**			
Demand Load:	**166,149 VA**			
Total Load (w/heating factors):	**176,269 VA**			
Minimum Feeder Size:	**489.3 Amps**	Motors (M):	18	68,342 VA
Formula:	*176.3 kVA /(1.732*0.208 kV)*	Miscellaneous (Z):	48	61,170 VA

Notes:
1. EXISTING TO REMAIN
2. REMOVE EXISTING 1P-20A BREAKERS AND REPLACE WITH NEW 3P-70A 35KAIC CIRCUIT BREAKER.

Circuit Breaker Panelboard

Name: **(E) 2A** | Mounting: **RECESSED**
Main: **Lugs** | Bus: **125A**
Volts: **120/208** | Bracing: **10,000**
Phase: **3** Wire: **4**

Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)	Ph A	Ph B	Ph C	Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)
1	20	1	6	L		(E) 203 LTG N. Bank	600	×			2	20	1	6	L		(E) 203 LTG S. Bank	600
3	20	1	4	R		(E) 204 Recept	720		×		4	20	1	10	L		(E) Main Hallway LTG	1000
5	20	1	4	L		(E) 202 LTG	400			×	6	20	1	5	L		(E) 204 LTG	500
7	20	1	7	L		(E) 201 LTG W. Bank	700	×			8	30	1	4	L		(E) 206 Hallway LTG	400
9	30	1	6	R		(E) 201 Recepts & 203 W. Recept	1080		×		10	30	1	4	L		(E) 206D LTG	400
11	20	1	7	L		(E) 201 LTG E. Bank	700			×	12	20	1	5	L		(E) 205 Ceiling LTG	500
13	20	1	1	M		(E) AIR 208	1200	×			14	30	1	4	L		(E) 208 LTG & Cooler LTG	400
15	20	1	1	M		(E) AC Rm 208	1200		×		16	20	1	4	L		(E) 210A LTG	400
17	20	1	4	R		(E) 203 Recept E. Wall	720			×	18	20	1	5	R		(E) 205 Recepts W. Wall	900
19	20	1	4	R		(E) 205 Recept E. Wall	720	×			20	20	1				(E) Spare	
21	20	1	5	R		(E) 208 Lal Table Receipts	900		×		22	20	1				(E) Spare	
23	20	1	5	R		(E) 210 Lab Table Receipts	900			×	24	20	1	7	R		(E) 210, 206A, 206B Recepts	1260
25	20	1	1	M		(E) AC Rm 206C	1200	×			26	20	1	6	R		(E) 206C, 206D Recepts	1080
27	20	1				(E) Spare			×		28	30	1	8	L		(E) 206B LTG S. Bank	800
29	30	1	5	L		(E) 206B LTG Center Bank	500			×	30	20	1	8	L		(E) 206B LTG N. Bank	800
31	30	1	10	L		(E) 206C LTG	1000	×			32	20	1	1	Z		(E) Hood 205	1200
33	20	1				(E) Spare			×		34	30	1				(E) Spare	
35	20	1				(E) Spare				×	36	30	1	3	R		(E) 205 Recepts E. Wall	540
37	20	1	4	R		(E) 306 Corridor Recepts	720	×			38	20	1				(E) Spare	
39	20	1				(E) Spare			×		40	20	1	7	R		(E) 208, 204 Recepts	1260

Totals

		Category	Qty	Load
Load on Phase A:	9,820 VA	Receptacles (R):	60	10,800 VA
Load on Phase B:	7,760 VA	Lights (L):	97	9,700 VA
Load on Phase C:	7,720 VA			
Connected Load:	**25,300 VA**			
Demand Load:	**24,900 VA**			
Total Load (w/heating factors):	**27,625 VA**			
Minimum Feeder Size:	**76.7 Amps**	Motors (M):	3	3,600 VA
Formula:	*27.6 kVA /(1.732*0.208 kV)*	Miscellaneous (Z):	1	1,200 VA

Notes:
1. PANEL SHOWN FOR LOAD CALCULATIONS ONLY.
2. PANEL IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

Circuit Breaker Panelboard

Name: **(E) 2B** | Mounting: **Surface**
Main: **Lugs** | Bus: **225A**
Volts: **120/208** | Bracing: **10,000**
Phase: **3** Wire: **4**

Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)	Ph A	Ph B	Ph C	Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)
1	20	1				(E) Spare		×			2	20	1	5	R		(E) 210 Recepts	900
3	20	1	1	M		(E) Cool Rm Evaporator (Spare?)	1200		×		4	20	1	5	R		(E) 210 Recepts	900
5	20	1	2	R		(E) Cooler Recepts	360			×	6	20	1	2	R		(E) Roof Recept	360
7	20	1	6	R		(E) 203 Plugmold West	1080	×			8	30	2	1	Z		(E) Centrifuge	1200
9	20	1	6	R		(E) 203 Plugmold West	1080		×		10						"	1200
11	20	1	1	Z		(E) 203 Sink Disposal	1200			×	12	20	1	1	Z		(E) Load	1200
13	20	1	1	Z		(E) Load	1200	×			14	20	1	1	Z		(E) Freezer Room 203	1200
15	20	1	1	Z		(E) Load	1200		×		16	20	1	1	Z		(E) Load	1200
17	20	1	6	R		(E) 203 Plugmold South (Spare?)	1080			×	18	20	1	1	Z		(E) Load	1200
19	20	1	1	Z		(E) Load	1200	×			20	20	1	1	Z		(E) Load	1200
21	20	1	1	Z		(E) Load	1200		×		22	20	1	1	Z		(E) Outside Security System	600
23	50	2	1	R		(E) 205 30A Recept	180			×	24	30	2	1	Z		(E) 203 Left/Right Oven	1200
25						"	180	×			26						"	1200
27	20	1	1	R		(E) 208 Office Recept	180		×		28	30	2	1	Z		(E) Large Surface Unit	1200
29	20	1	1	R		(E) 208 Office Recept	180			×	30						"	1200
31	15	3	1	Z		(E) Load	600	×			32	30	2	1	Z		(E) Load	1200
33						"	600		×		34						"	1200
35						"	600			×	36	20	1	1	Z		(E) Load	1200
37	60	3	1	Z		(E) Load	2500	×			38	50	3	1	Z		(E) Load	2000
39						"	2500		×		40						"	2000
41						"	2500			×	42						"	2000

Totals

		Category	Qty	Load
Load on Phase A:	15,660 VA	Receptacles (R):	35	6,300 VA
Load on Phase B:	16,260 VA			
Load on Phase C:	14,460 VA			
Connected Load:	**46,380 VA**			
Demand Load:	**46,200 VA**			
Total Load (w/heating factors):	**46,500 VA**			
Minimum Feeder Size:	**129.1 Amps**	Motors (M):	1	1,200 VA
Formula:	*46.5 kVA /(1.732*0.208 kV)*	Miscellaneous (Z):	19	38,700 VA

Notes:
1. DEMOLISH EXISTING PANEL AND ASSOCIATED BREAKERS AND BRANCH WIRES.
2. REMOVE EXISTING LOAD FROM PANEL 2B AND MOVE TO PANEL L2B.
3. CONTRACTOR TO VERIFY EXISTING CIRCUITS.

Circuit Breaker Panelboard

Name: **(E) 2C** | Mounting: **Surface**
Main: **Lugs** | Bus: **225A**
Volts: **120/208** | Bracing: **10,000**
Phase: **3** Wire: **4**

Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)	Ph A	Ph B	Ph C	Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)
1	20	1	1	M		(E) Furnace on Roof	1200	×			2	20	1	4	R		(E) Rm 206 E. Wall Recept	720
3	20	1	1	M		(E) Fume Hood Rm 208B (Spare?)	1200		×		4	20	1	4	R		(E) Rm 206 SE. Wall Recept	720
5	20	1	6	R		(E) Rm 206 Recept Center Counter	1080			×	6	20	1	5	R		(E) Rm 206 S & SE Wall Recept	900
7	20	1	4	R		(E) Rm 206 Recept North Counter	720	×			8	20	1	4	R		(E) Rm 208 W. Recepts	720
9	20	1	2	R		(E) Rm 206 110V Recept	360		×		10	20	1	4	R		(E) Rm 208 W. Recepts	720
11	20	1	3	R		(E) Rm 208 Recept W. Wall	540			×	12	20	1	6	R		(E) Rm 206 Center Counter Recept	1080
13	20	1	3	R		(E) RM 201 E. Wall Recept	540	×			14	20	1	4	R		(E) Recept E. Hall	720
15	20	1	4	R		(E) Rm 201 W. Wall Recept	720		×		16	20	1	4	R		(E) 205 Recept W. Wall	720
17	20	1	4	R		(E) Rm 201 W. Wall Recept	720			×	18	20	1	1	Z		(E) Load	1200
19	20	1	4	R		(E) Rm 201 AC Recept W. Wall	720	×			20	20	1	1	Z		(E) Load	1200
21	20	1	1	Z		(E) Load	1200		×		22	20	2	4	R		(E) Rm 206 N. Wall 220V Recept	720
23	20	1	1	R		(E) 110V 30A Recept W. Wall	180			×	24						"	720
25	20	2	1	R		(E) Rm 206 220V 30A Recept SE Wall	180	×			26	20	2	1	Z		(E) Rm 206	1200
27						"	180		×		28						"	1200
29	20	2	1	R		(E) Rm 206 220V 30A Recept W Wall	180			×	30	20	2	1	Z		(E) Rm 210 Oven	1500
31						"	180	×			32						"	1500
33	20	2	1	M		(E) Rm 208 Fume Hood	1200		×		34	20	2	1	Z		(E) Rm 205 Oven	1500
35						"	1200			×	36						"	1500
37	40	3	1	Z		(E) Rm 205 Sterilizer	2000	×			38	30	3	1	Z		(E) Load	1500
39						"	2000		×		40						"	1500
41						"	2000			×	42						"	1500

Totals

		Category	Qty	Load
Load on Phase A:	13,100 VA	Receptacles (R):	72	12,960 VA
Load on Phase B:	13,940 VA			
Load on Phase C:	14,300 VA			
Connected Load:	**41,340 VA**			
Demand Load:	**38,780 VA**			
Total Load (w/heating factors):	**39,380 VA**			
Minimum Feeder Size:	**109.3 Amps**	Motors (M):	3	4,800 VA
Formula:	*39.4 kVA /(1.732*0.208 kV)*	Miscellaneous (Z):	8	22,500 VA

Notes:
1. DEMOLISH EXISTING PANEL AND ASSOCIATED BREAKERS AND BRANCH WIRES.
2. REMOVE EXISTING LOAD FROM PANEL 2C AND MOVE TO PANEL L2B.
3. CONTRACTOR TO VERIFY EXISTING CIRCUITS.

Circuit Breaker Panelboard

Name: **L2B** | Mounting: **SURFACE**
Main: **CB** | Bus: **225A**
Volts: **120/208** | Bracing: **18,000**
Phase: **3** Wire: **4**

Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)	Ph A	Ph B	Ph C	Ckt#	Brkr Amp	Outlets P	Qty	Cat	Notes	Location/Description	Load (VA)
1	20	1			1,3	(E) Spare		×			2	20	1	5	R	1,3	(E) 210 Recepts	900
3	20	1	1	M	1,3	(E) Cool Rm Evaporator	1200		×		4	20	1	5	R	1,3	(E) 210 Recepts	900
5	20	1	2	R	1,3	(E) Cooler Recepts	360			×	6	20	1	2	R	1,3	(E) Roof Recept	360
7	20	1	6	R	1,3	(E) 203 Plugmold West	1080	×			8	30	2	1	Z	1,3	(E) Centrifuge	1200
9	20	1	6	R	1,3	(E) 203 Plugmold West	1080		×		10						"	1200
11	20	1	1	Z	1,3	(E) 203 Sink Disposal	1200			×	12	20	1	1	Z	1,3	(E) Load	1200
13	20	1	1	Z	1,3	(E) Load	1200	×			14	20	1	1	Z	1,3	(E) Freezer Room 203	1200
15	20	1	1	Z	1,3	(E) Load	1200		×		16	20	1	1	Z	1,3	(E) Load	1200
17	20	1	6	R	1,3	(E) 203 Plugmold South	1080			×	18	20	1	1	Z	1,3	(E) Load	1200
19	20	1	1	Z	1,3	(E) Load	1200	×			20	20	1	1	Z	1,3	(E) Load	1200
21	20	1	1	Z	1,3	(E) Load	1200		×		22	20	1	1	Z	1,3	(E) Load	1200
23	50	2	1	R	1,3	(E) 205 30A Recept	180			×	24	30	2	1	Z	1,3	(E) Outside Security System	600
25						"	180	×			26						"	1200
27	20	1			1,3	SPARE			×		28	30	2	1	Z	1,3	(E) Large Surface Unit	1200
29	20	1			1,3	SPARE				×	30						"	1200
31	15	3	1	Z	1,3	(E) Load	600	×			32	30	2	1	Z	1,3	(E) Load	1200
33						"	600		×		34						"	1200
35						"	600			×	36	20	1	1	M	2,3	(E) Furnace on Roof	1200
37	20	1	1	M	2,3	(E) Furnace on Roof	1200	×			38						"	
39	20	1	1	R	2,3	(E) Rm 206 SE. Wall Recept	720		×		40						"	
41	20	2	1	R	2,3	(E) Rm 206 S & SE Wall Recept	900			×	42						"	
43	20	1	1	M	2,3	(E) Furnace on Roof	1200	×			44	20	1	4	R	2,3	(E) Rm 206 E. Wall Recept	720
45	20	1	1	R	2,3	SPARE			×		46	20	1	4	R	2,3	(E) Rm 206 SE. Wall Recept	720
47	20	1	6	R	2,3	(E) Rm 206 Recept Center Counter	1080			×	48	20	1	5	R	2,3	(E) Rm 206 S & SE Wall Recept	900
49	20	1	4	R	2,3	(E) Rm 206 Recept North Counter	720	×			50	20	1			2,3	SPARE	
51	20	1	2	R	2,3	(E) Rm 206 110V Recept	360		×		52	20	1			2,3	SPARE	
53	20	1			2,3	SPARE				×	54	20	1	6	R	2,3	(E) Rm 206 Center Counter Recept	1080
55	20	1	3	R	2,3	(E) RM 201 E. Wall Recept	540	×			56	20	1	4	R	2,3	(E) Recept E. Hall	720
57	20	1	4	R	2,3	(E) Rm 201 W. Wall Recept	720		×		58	20	1	1	Z	2,3	(E) Load	1200
59	20	1	4	R	2,3	(E) Rm 201 W. Wall Recept	720			×	60	20	2	1	Z	2,3	(E) Load	1200
61	20	1	4	R	2,3	(E) Rm 201 AC Recept W. Wall	720	×			62						"	1200
63	20	1	1	Z	2,3	(E) Load	1200		×		64	20	1	4	R	2,3	(E) Rm 206 N. Wall 220V Recept	720
65	20	1	1	R	2,3	(E) 110V 30A Recept W. Wall	180			×	66	20	2	1	Z	2,3	(E) Rm 206	1200
67	20	2	1	R	2,3	(E) Rm 206 220V 30A Recept SE Wall	180	×			68						"	1200
69						"	180		×		70	30	2	1	Z	2,3	(E) Rm 210 Oven	1500
71	20	2	1	R	2,3	(E) Rm 206 220V 30A Recept W Wall	180			×	72						"	1500
73						"	180	×			74	20	3	1	Z	2,3	(E) Load	1500
75	20	2			2,3	SPARE			×		76						"	1500
77						"				×	78						"	1500
79	40	3	1	Z	2,3	(E) Rm 205 Sterilizer	2000	×			80	30	3	1	Z	2,3	(N) SPD	
81						"	2000		×		82						"	
83						"	2000			×	84						"	

Totals

		Category	Qty	Load
Load on Phase A:	26,540 VA	Receptacles (R):	90	16,200 VA
Load on Phase B:	26,180 VA			
Load on Phase C:	25,820 VA			
Connected Load:	**78,540 VA**			
Demand Load:	**54,200 VA**			
Total Load (w/heating factors):	**54,500 VA**			
Minimum Feeder Size:	**151.3 Amps**	Motors (M):	2	2,400 VA
Formula:	*54.5 kVA /(1.732*0.208 kV)*	Miscellaneous (Z):	27	38,700 VA

General Notes:
1. PROVIDE FULL BOTTOM SKIRTS AND TOP SKIRT TO +8'-6"

Circuit Notes:
1. REMOVE LOAD FROM PANEL 2B AND CIRCUIT TO L2B.
2. REMOVE LOAD FROM PANEL 2C AND CIRCUIT TO L2B.
3. PROVIDE GFCI CIRCUIT BREAKER WITH 5mA TRIP RATING.

Branch Panel: (N) L2C

Location: Space 21 | **Volts:** 120/208 Wye | **A.I.C. Rating:** 18,000
Supply From: (E) PANEL M | **Phases:** 3 | **Bus Rating:** 225 A
Mounting: Surface | **Wires:** 4 | **Mains:** CB 3P-225 A
Enclosure: Type 1

CKT	Amp	ø	Cat	Notes	Load Name	A	B	C	A	B	C	Load Name	Notes	Cat	ø	Amp	CKT
1	20	1	Rec...	1	Receptacle Room 2, 25	720			360			Receptacle ROOF	1	Rec...	1	20	2
3	20	1	Rec...	1	Receptacle Room 2, 22		720			1903		HP-1		Me...	2	20	4
5	20	1	Rec...	1	Receptacle Room 2, 22			1080			1903	--	--	--	--	--	6
7	20	1	Rec...	1	Receptacle Space 3	720			1040			W/D-1	1	Mis...	2	20	8
9	20	1	Rec...	1	Receptacle Room 3, 10		720			1040		--	--	--	--	--	10
11	20	1	Me...	1	BSH-11			960			1709	Lighting Room 25, 2		Lig...	1	20	12
13	20	1	Rec...	1	Receptacle Room 3, 10	540			0			FC-1		Me...	2	20	14
15										0		--	--	--	--	--	16
17	20	1	Rec...	1	Receptacle Space 22		720			600		BCA-1	1	Mis...	1	20	18
19	20	1	Rec...	1	Receptacle Space 22	540			600			EXT-1	1	Mis...	1	20	20
21	20	1	Rec...	1	Receptacle Space 9		720			600		MM-1	1	Mis...	1	20	22
23	20	1	Rec...	1	Receptacle Space 10			360			600	SC-1	1	Mis...	1	20	24
25	20	1	Rec...	1	Receptacle Space 10	360			600			UT-1	1	Mis...	1	20	26
27	20	1	Rec...	1	Receptacle Space 10		360			600		EXT-2	1	Mis...	1	20	28
29	20	1	Rec...	1	Receptacle Space 10			360			600	WPS-1	1	Mis...	1	20	30
31	20	1	Rec...	1	Receptacle Space 10	540			2402			UF-1	1	Me...	3	30	32
33	20	1	Me...	1	FH-1		1200			2402		--	--	--	--	--	34
35	20	1	Mis...	1	REF-1			264			2402	--	--	--	--	--	36
37	20	1	Mis...	1	FRZ-4	600			120			GSV-1	1	Me...	1	20	38
39	20	1	Mis...	1	FRZ-3		600			1040		FRZ-2	1	Mis...	2	20	40
41	20	2	Mis...	1	FRZ-1			1040			1040	--	--	--	--	--	42
43	--	--	--	--	--	1040			416			EF-1		Me...	2	20	44
45	20	1	Rec...	1	Receptacle Space 10		360			416		--	--	--	--	--	46
47	20	1	Rec...	1	Receptacle Space 10			360			0	Spare	--	--	1	20	48
49	20	1	Rec...	1	Receptacle Space 10	360			0			Spare	--	--	1	20	50
51	20	1	Rec...	1	Receptacle Space 10		360			0		Spare	--	--	1	20	52
53	20	1	Rec...	1	Receptacle Space 10			360			0	Spare	--	--	1	20	54
55	20	1	Rec...	1	Receptacle Space 10	360			0			Spare	--	--	1	20	56
57	20	1	Rec...	1	Receptacle Space 10		720			0		Spare	--	--	1	20	58
59	20	1	Rec...	1	Receptacle Space 10			360			0	Spare	--	--	1	20	60
61	20	1	Rec...	1	Receptacle Space 10	360			0			Spare	--	--	1	20	62
63	20	1	Rec...	1	Receptacle Space 10		360			0		Spare	--	--	1	20	64
65	20	1	Rec...	1

COPPER FEEDER SCHEDULE

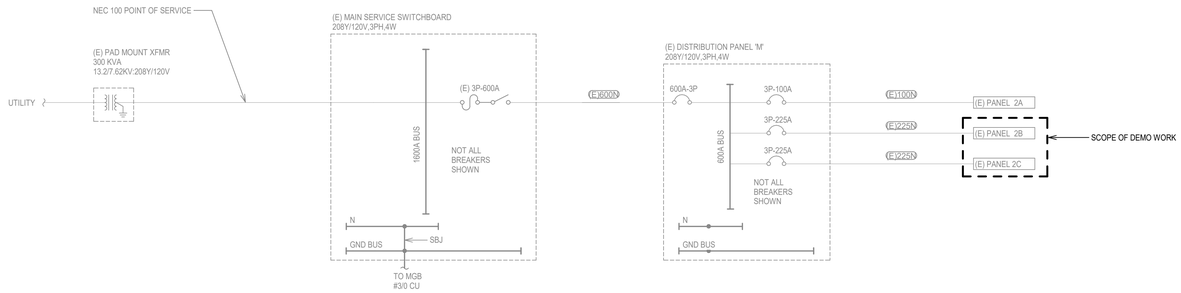
AMPACITY (AMPS)	FEEDER WITH NEUTRAL					FEEDER WITH 200% NEUTRAL AND ISOLATED GROUND					FEEDER WITHOUT NEUTRAL				
	FEEDER NUMBER	NUMBER OF SETS	CONDUIT (INCHES)	CONDUCTOR	GROUND	FEEDER NUMBER	NUMBER OF SETS	CONDUIT (INCHES)	CONDUCTOR	GROUND	FEEDER NUMBER	NUMBER OF SETS	CONDUIT (INCHES)	CONDUCTOR	GROUND
20	20N	1	3/4	4#12	#12	20K	1	3/4	3#12+#8	2#12	20	1	3/4	3#12	#12
30	30N	1	3/4	4#10	#10	30K	1	1	3#8+#4	2#10	30	1	3/4	3#10	#10
40	40N	1	1	4#8	#10	40K	1	1	3#8+#3	2#10	40	1	1	3#8	#10
50	50N	1	1	4#6	#8	50K	1	1 1/4	3#6+#1	2#8	50	1	1	3#6	#8
60	60N	1	1 1/4	4#4	#8	60K	1	1 1/4	3#4+#1	2#8	60	1	1 1/4	3#4	#8
70	70N	1	1 1/4	4#4	#8	70K	1	1 1/2	3#3+#1/0	2#8	70	1	1 1/4	3#4	#8
80	80N	1	1 1/2	4#3	#8	80K	1	1 1/2	3#3+#2/0	2#8	80	1	1 1/4	3#3	#8
90	90N	1	1 1/2	4#2	#8	90K	1	1 1/2	3#2+#3/0	2#8	90	1	1 1/4	3#2	#8
100	100N	1	2	4#1	#6	100K	1	2	3#1+#3/0	2#6	100	1	1 1/2	3#1	#6
125	125N	1	2	4#1	#6	125K	1	2 1/2	5#2/0	2#4	125	1	1 1/2	3#1	#6
150	150N	1	2	4#1/0	#6	150K	1	2 1/2	5#3/0	2#4	150	1	2	3#1/0	#6
175	175N	1	2	4#2/0	#4	175K	1	2 1/2	5#4/0	2#2	175	1	2	3#2/0	#4
200	200N	1	2 1/2	4#3/0	#4	200K	1	3	5#250	2#2	200	1	2	3#3/0	#4
225	225N	1	2 1/2	4#4/0	#2	225K	1	3	5#300	2#2	225	1	2 1/2	3#4/0	#2
250	250N	1	3	4#250	#2	250K	1	4	5#400	2#1/0	250	1	3	3#250	#2
300	300N	1	4	4#350	#2	300K	1	4	5#500	2#1/0	300	1	3	3#350	#2
350	350N	1	4	4#500	#1/0	350K	2	2 1/2	5#4/0	2#2/0	350	1	4	3#500	#1/0
400	400N	1	4	4#600	#1/0	400K	2	3	5#250	2#2/0	400	1	4	3#600	#1/0
450	450N	2	2 1/2	4#4/0	#2/0	450K	2	3	5#300	2#2/0	450	2	2 1/2	3#4/0	#2/0
500	500N	2	3	4#250	#2/0	500K	2	4	5#400	2#2/0	500	2	3	3#250	#2/0
600	600N	2	4	4#350	#2/0	600K	2	4	5#500	2#3/0	600	2	3	3#350	#2/0
700	700N	2	4	4#500	#3/0	700K	4	2 1/2	5#4/0	2#3/0	700	2	4	3#500	#3/0
800	800N	2	4	4#600	#3/0	800K	4	3	5#250	2#3/0	800	2	4	3#600	#3/0
1000	1000N	3	4	4#400	#3/0	1000K	4	4	5#400	2#3/0	1000	3	3	3#400	#3/0
1200	1200N	4	4	4#350	#3/0	1200K	4	4	5#500	2#3/0	1200	4	3	3#350	#3/0
1600	1600N	4	4	4#600	#4/0	1600K	8	3	5#250	2#4/0	1600	4	4	3#600	#4/0
2000	2000N	5	4	4#600	#250	2000K	8	4	5#400	2#250	2000	5	4	3#600	#250
2500	2500N	6	4	4#600	#350	2500K	10	4	5#400	2#350	2500	6	4	3#600	#350
3000	3000N	8	4	4#500	#400	3000K	10	4	5#500	2#400	3000	8	4	3#500	#400
4000	4000N	10	4	4#600	#500	4000K	16	4	5#400	2#500	4000	10	4	3#600	#500

NOTES:

1. CONDUIT SIZES ARE BASED ON THWN INSULATION FOR ALL CONDUCTORS AND RGS CONDUIT.

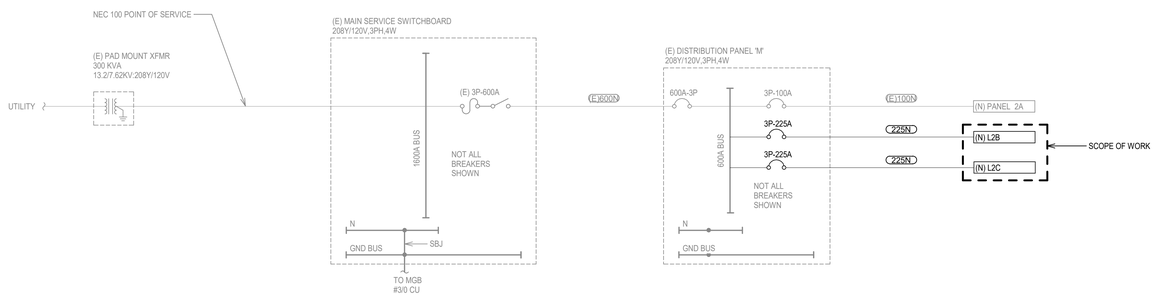
Short Circuit Current Calculations

3 PHASE Fault		Total Fault Currents
Name	**Bus kV**	**Sym Amps**
L2A	0.208	14356
L2B	0.208	14356
MAIN	0.208	24021
PNL M	0.208	19386.6



1 PARTIAL ONE-LINE DIAGRAM - ELECTRICAL - DEMOLITION

N.T.S.



2 PARTIAL ONE-LINE DIAGRAM - ELECTRICAL - REVISED

N.T.S.

GENERAL NOTES:

1. EXISTING CONDITIONS ARE BASED UPON BEST AVAILABLE RECORD DRAWINGS.
2. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
3. ALL EQUIPMENT SHOWN IN THIS DRAWING IS EXISTING TO REMAIN UNLESS NOTED OTHERWISE.

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOHN JOSEPH CUNNINGHAM

TITLE: ONE-LINE DIAGRAM - ELECTRICAL

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

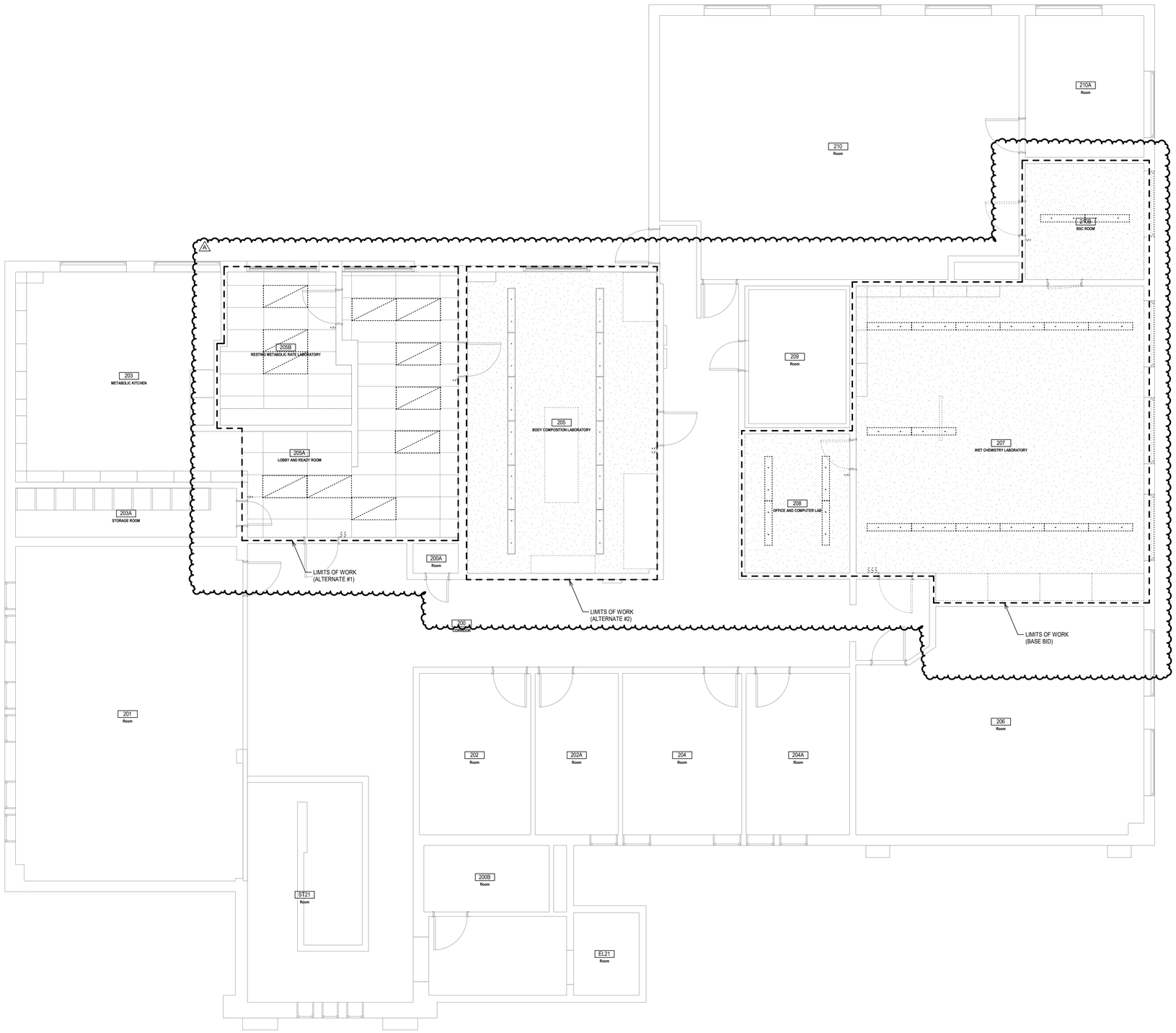
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

E8-01

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



LEVEL 2 - DEMO PLAN - LIGHTING

1/4" = 1'-0"

KNIT
knitstudios.com

escent
LIGHTING DESIGN
601 W First Ave, St 1300
Spokane, WA 99201, USA
509.838.9020
www.meyngroers.com/escent

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER
LICENSED
STATE OF IDAHO
JOSEPH CUNNINGHAM

TITLE: DEMO FLOOR PLAN - LIGHITNG

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE. MOSCOW, ID 83844

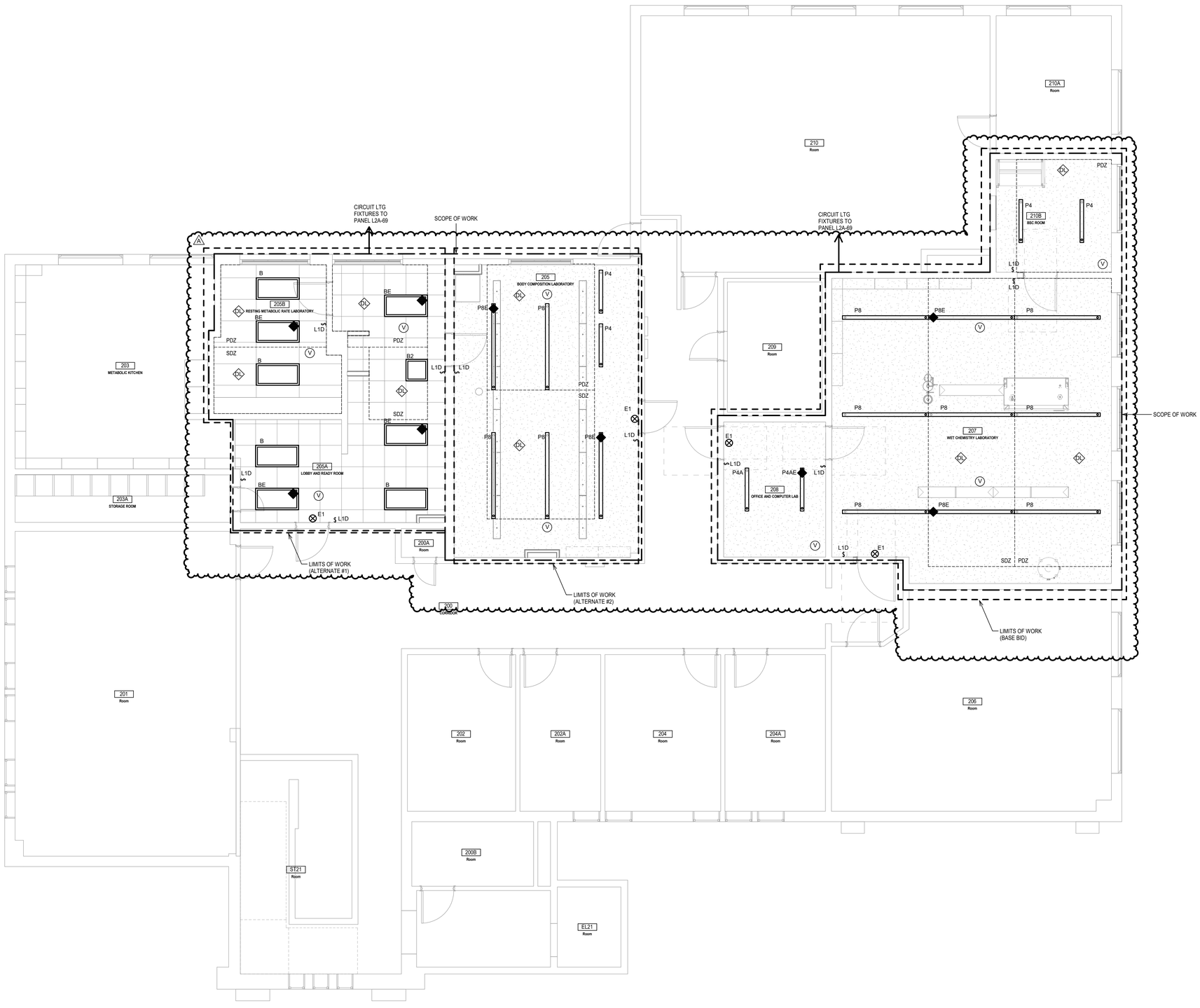
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

ELD2-11

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



LEVEL 2 - LIGHTING

N 1/4" = 1'-0"

KNIT
knitstudios.com

escent
LIGHTING DESIGN
601 W First Ave, St 1300
Spokane, WA 99201, USA
509.838.9020
www.meetingmeers.com/escent

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

TITLE: FLOOR PLAN - LIGHITNG

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

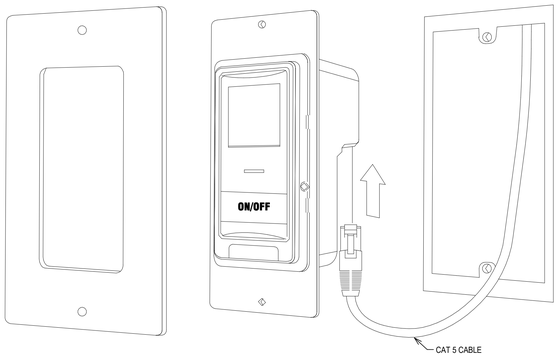
JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

EL2-11

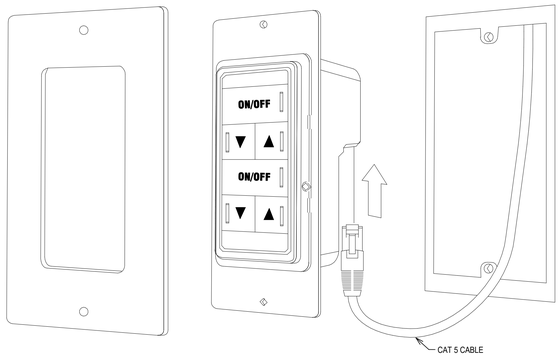
LIGHTING CONTROL NOTES:

1. CORRIDORS, LOBBIES AND OTHER COMMON AREAS NOT SHOWN WITH OCCUPANCY SENSORS SHALL BE CONTROLLED VIA TIMESWEEP.
2. EXTERIOR LIGHTING (NOT FACADE OR LANDSCAPE) SHALL REDUCE POWER DENSITY BY MINIMUM 30% BETWEEN 12AM AND 6AM. PER ENERGY CODE.
3. EXTERIOR FACADE AND LANDSCAPE LIGHTING SHALL BE CONTROLLED TO AUTOMATICALLY SHUT OFF DAWN TO DUSK VIA TIME CLOCK. PER ENERGY CODE.

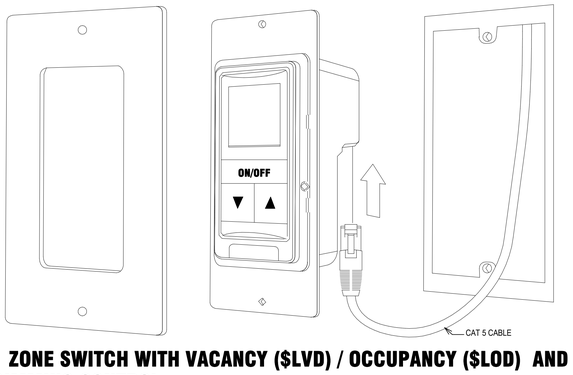
NOTE: NOT ALL DETAILS MAY BE INCLUDED IN PROJECT



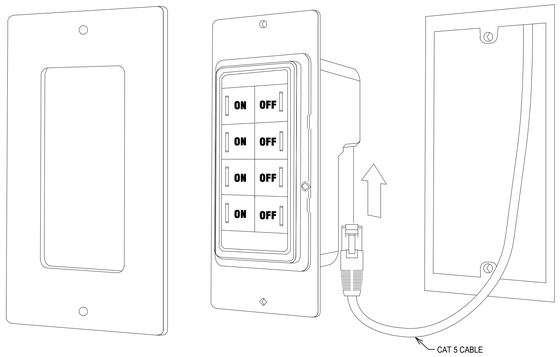
$LVS $LOS 1 ZONE SWITCH WITH VACANCY ($LVS) / OCCUPANCY ($LOS) SENSOR



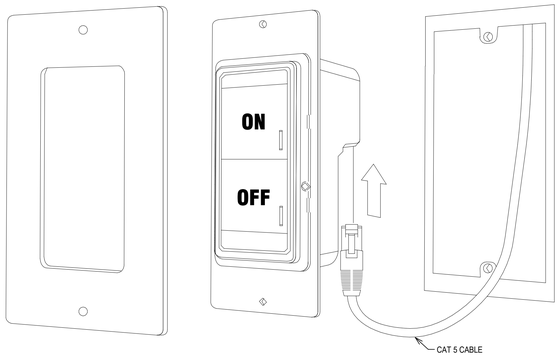
$L2D 2 ZONE ON/OFF TOGGLE WITH DIMMING



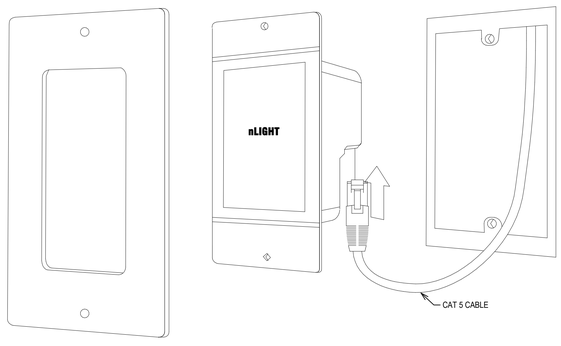
$LVD $LOD 1 ZONE SWITCH WITH VACANCY ($LVD) / OCCUPANCY ($LOD) AND DIMMING CONTROL



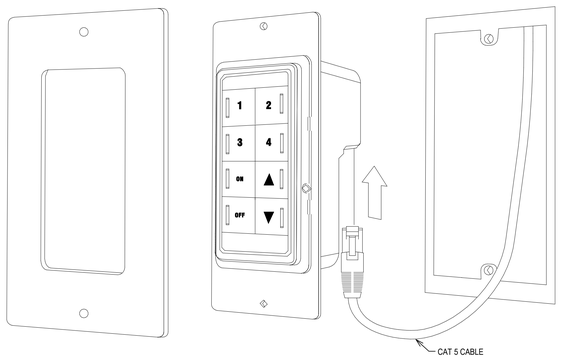
$L4 4 ZONE ON/OFF TOGGLE



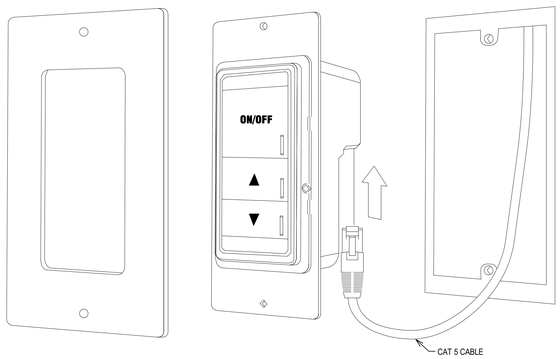
$L1 1 ZONE ON/OFF TOGGLE



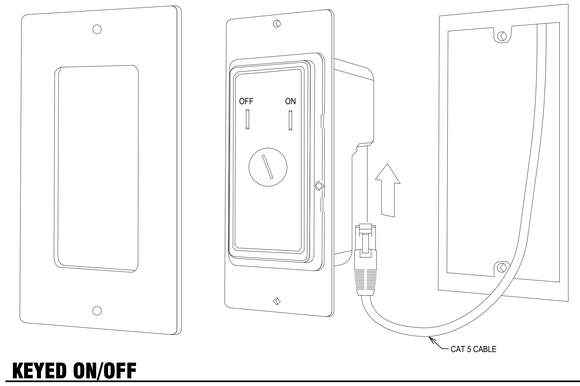
$LTS SWITCH - TOUCH SCREEN



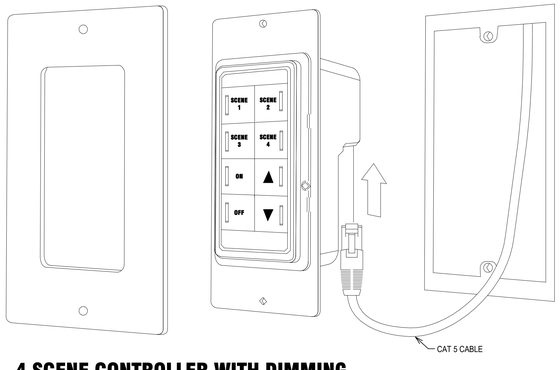
$L4D 4 ZONE ON/OFF TOGGLE WITH DIMMING



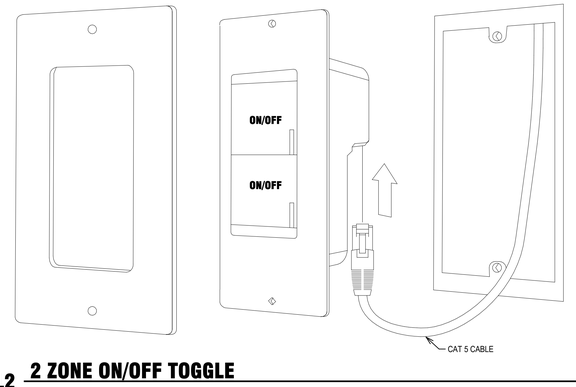
$L1D 1 ZONE ON/OFF TOGGLE WITH DIMMING



$LK KEYED ON/OFF



$L4S 4 SCENE CONTROLLER WITH DIMMING



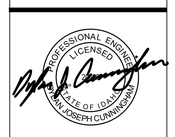
$L2 2 ZONE ON/OFF TOGGLE

KNIT
knitstudios.com

escent
LIGHTING DESIGN
601 W First Ave, St 1300
Spokane, WA 99201, USA
509.838.9020
www.meengineers.com/escent

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT



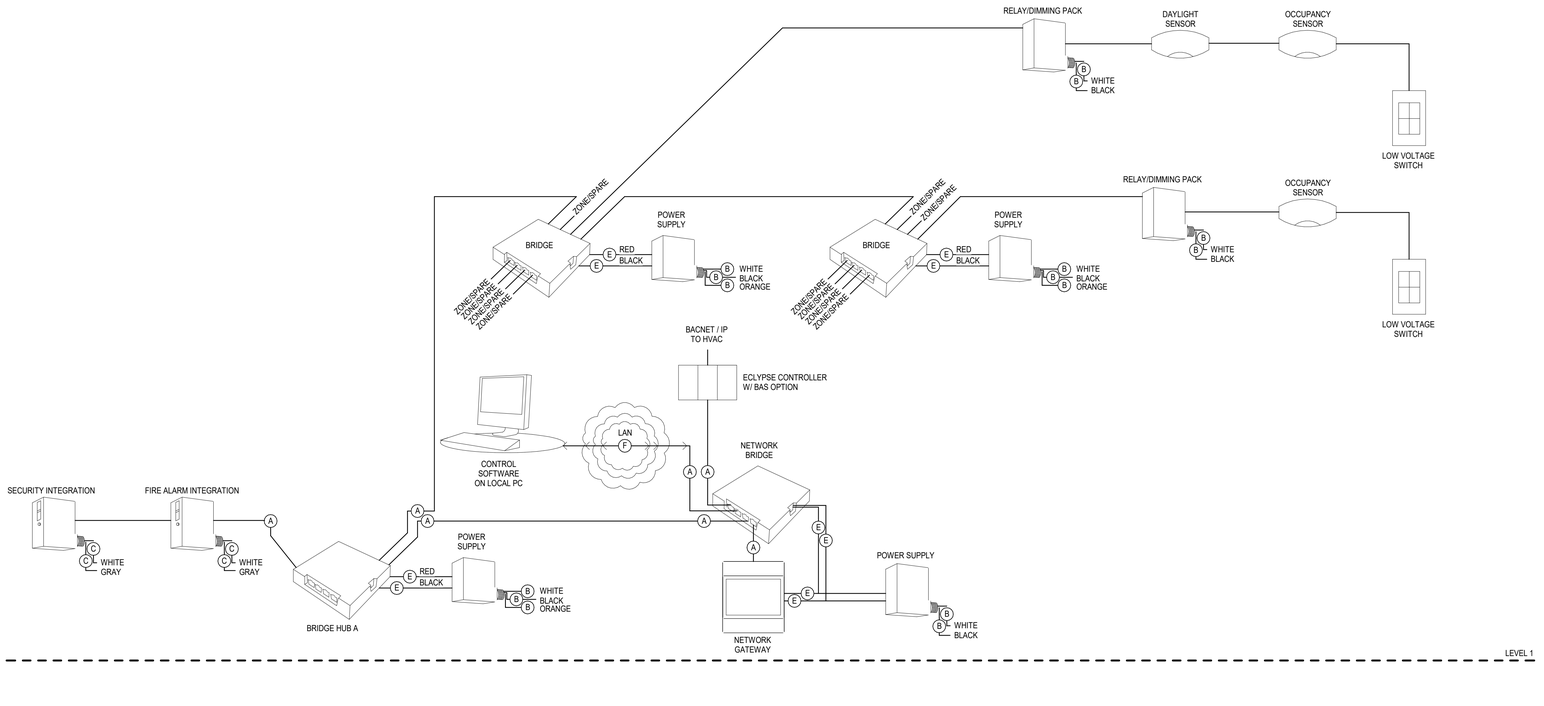
TITLE: DETAILS - LIGHTING

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

EL5-01



NOTES:
1. LINE VOLTAGE AND LOW VOLTAGE WIRING SHOWN FOR REFERENCE ONLY. PLEASE REFER TO PRODUCT DATASHEETS FOR DETAILED WIRING INFORMATION.
2. DO NOT CONNECT LINE VOLTAGE TO 0-10V WIRES ON nLIGHT DEVICES.
3. QUANTITY OF DEVICES SHOWN IS FOR DIAGRAMMATIC PURPOSES ONLY. CONTRACTOR SHALL PROVIDE THE APPROPRIATE AMOUNT OF DEVICES NEEDED TO ACHIEVE THE FUNCTIONALITY DESCRIBED ON THE FLOOR PLANS.
4. FOR ROOMS SPECIFIED WITH TUNEABLE WHITE LIGHTING FIXTURES, PROVIDE WALL STATION WITH COMPATIBLE SCENE CONTROLS.

WIRE LEGEND	
A	CAT 5-E (CLASS 2)
B	LINE VOLTAGE
C	18/2 CONTACT CLOSURE
D	LOW VOLTAGE (1A @ 40 VDC/VAC)
E	15-24 VDC POWER
F	EHTERNET LAN (CLASS 2)

1 TYPICAL LIGHTING CONTROL RISER
N.T.S.

KNIT
knitstudios.com

escent
LIGHTING DESIGN
601 W First Ave, St 1300
Spokane, WA 99201, USA
509.838.9020
www.meyersiners.com/escent

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

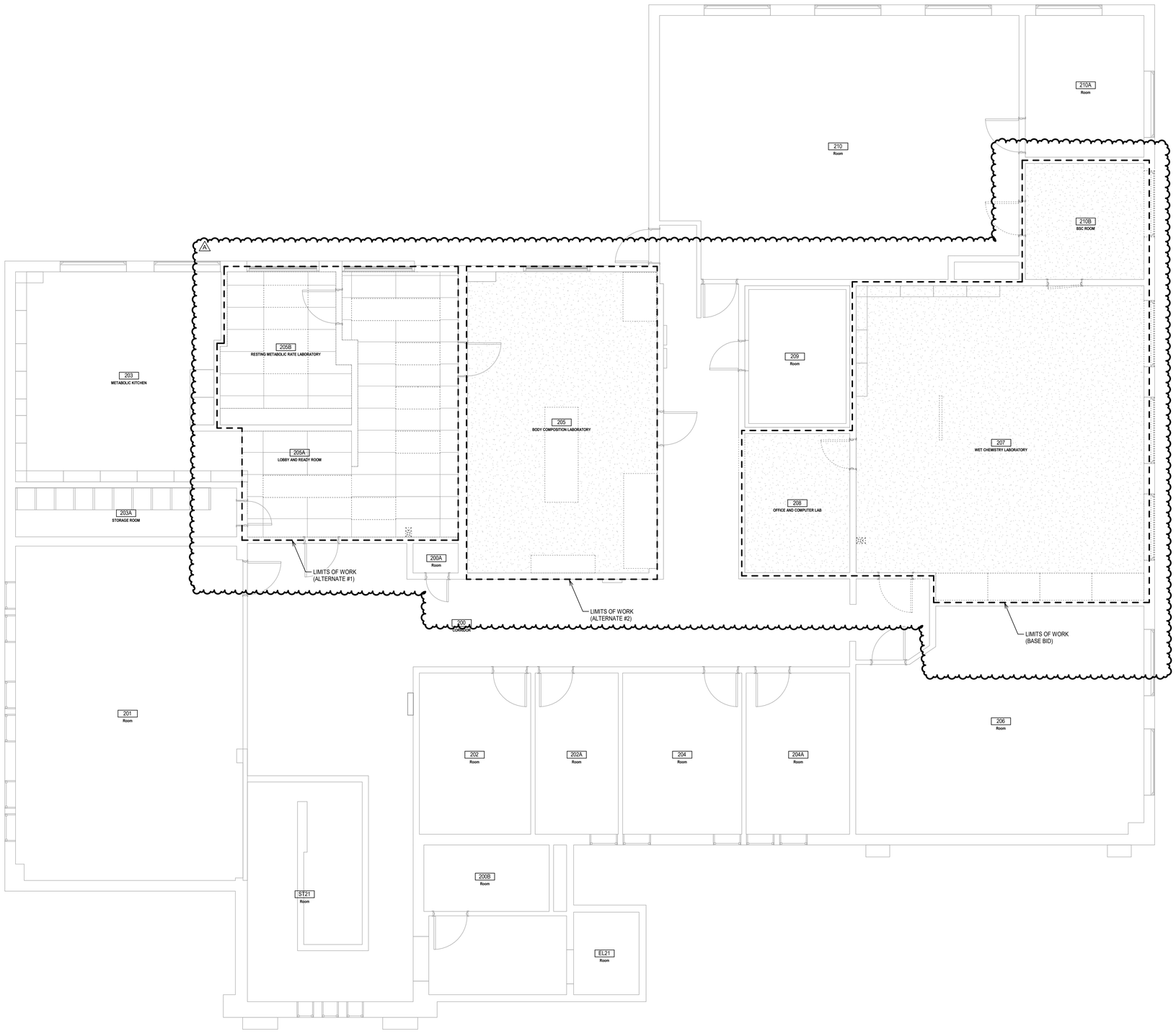
TITLE: DETAILS - LIGHTING
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

EL5-02

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



LEVEL 2 - DEMO PLAN - FIRE ALARM

1/4" = 1'-0"

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.0029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: DEMO FLOOR PLAN - FIRE ALARM

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE. MOSCOW, ID 83844

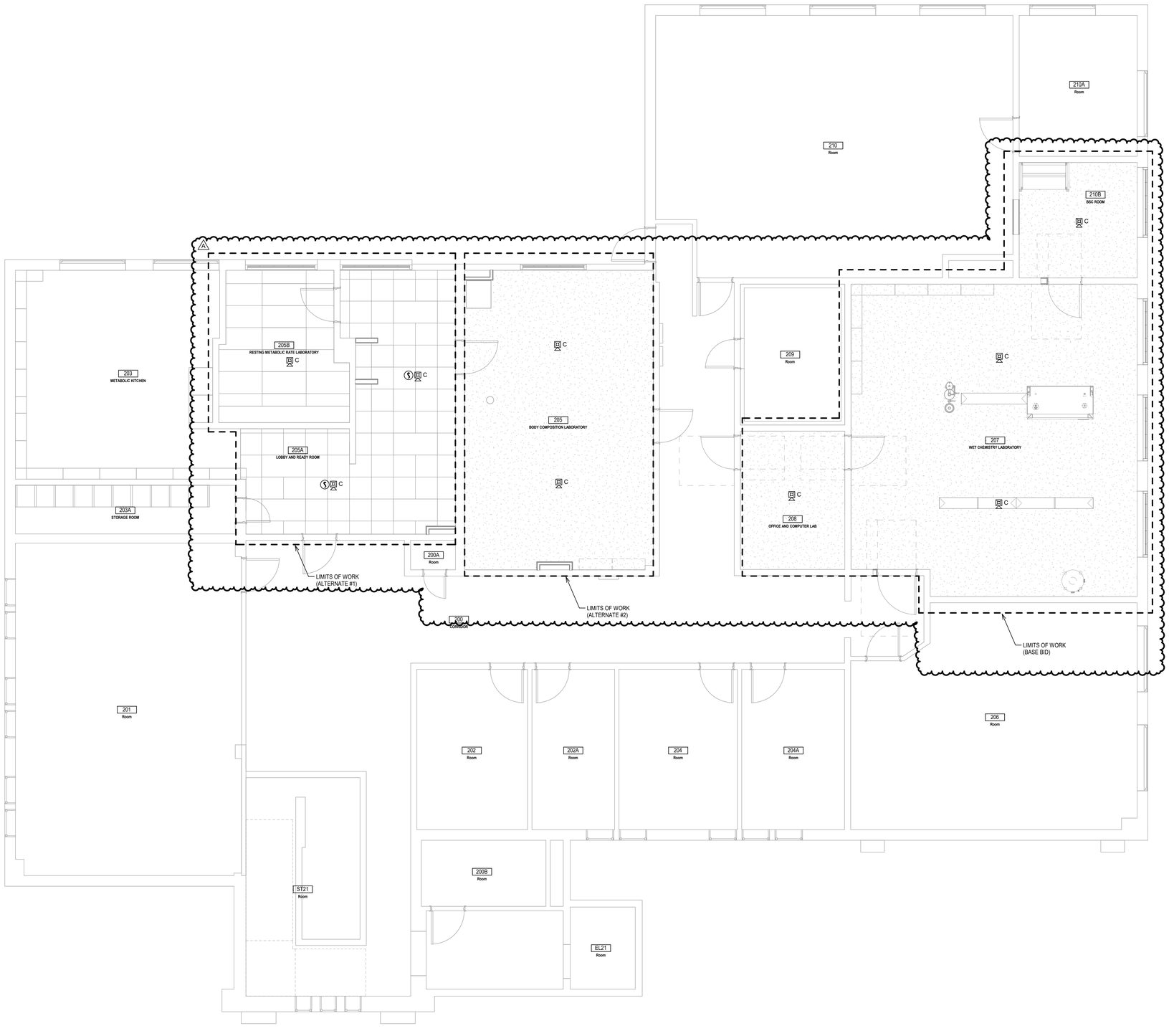
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

FAD2-11

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
2. FACP LOACED IN THE FIRST FLOOR CORRIDOR.



LEVEL 2 - FIRE ALARM

1/4" = 1'-0"

KNIT

knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9020
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: FLOOR PLAN - FIRE ALARM

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

FA2-11

COMMUNICATIONS SYMBOLS

3	3-PORT COMMUNICATIONS OUTLET, (1) 3-PORT FACEPLATE WITH (3) 8-POSITION CAT 6A RJ-45 JACKS, WALL FLUSH MOUNTED 18" AFF, UNLESS NOTED OTHERWISE. REFER TO SHEET T5-01 DETAIL 1 FOR OUTLET DETAIL.
WAP	3-PORT COMMUNICATIONS OUTLET, (1) 3-PORT FACEPLATE WITH (3) 8-POSITION CAT 6A RJ-45 JACKS, WALL FLUSH MOUNTED 18" AFF, UNLESS NOTED OTHERWISE. REFER TO SHEET T5-01 DETAIL 1 FOR OUTLET DETAIL.

COMMUNICATIONS ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
AWG	AMERICAN WIRE GAUGE
BB	BACKBONE
BIX	BIX BLOCK
C	CONDUIT
CAT 3	CATEGORY 3
CAT 5	CATEGORY 5
CAT 5E	CATEGORY 5, ENHANCED
CAT 6	CATEGORY 6
CONN	CONNECTOR
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CR	COMPUTER ROOM
EIA	ELECTRONIC INDUSTRIES ALLIANCE
EMI	ELECTROMAGNETIC INTERFERENCE
EMT	ELECTRICAL METALLIC TUBING
FF	FINISHED FLOOR
FO	FIBER OPTIC
FOC	FIBER OPTIC CABLE
GE	GROUNDING EQUALIZER
HH	HAND HOLE
ISP	INSIDE PLANT
JBOX	JUNCTION BOX
LAN	LOCAL AREA NETWORK
MDF	MAIN DISTRIBUTION FRAME
MH	MAINTENANCE HOLE
MHz	MEGAHERTZ
MIC	MICROPHONE
MM	MULTIMODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OSP	OUTSIDE PLANT
P/C	PATCH CORD
P/P	PATCH PANEL
PB	PULL BOX
PC	PERSONAL COMPUTER
PR	PAIR
PVC	POLYVINYL CHLORIDE
RM	ROOM
RMU	RACK MOUNT UNIT
SM	SINGLEMODE
SPKR	SPEAKER
STR	STRAND
SWTH	SWITCH TAIL
TBB	TELECOMMUNICATION BONDING BACKBONE
TC	TELECOMMUNICATIONS CLOSET
TGB	TELECOMMUNICATIONS GROUNDING BUSBAR
TIA	TELECOMMUNICATIONS INDUSTRY ASSOCIATION
TMGB	TELECOMMUNICATIONS MAIN GROUNDING BUSBAR
TR	TELECOMMUNICATIONS ROOM, ALSO SEE TC
TYP	TYPICAL
UG	UNDERGROUND CONDUIT
UL	UNDERWRITERS LABORATORIES
um	MICRON OR MICROMETER
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHIELDED TWISTED-PAIR
WA	WORK AREA
WM	WALL MOUNTED
WS	WORKSTATION

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: LEGENDS & ABBREVIATIONS - TELECOM

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

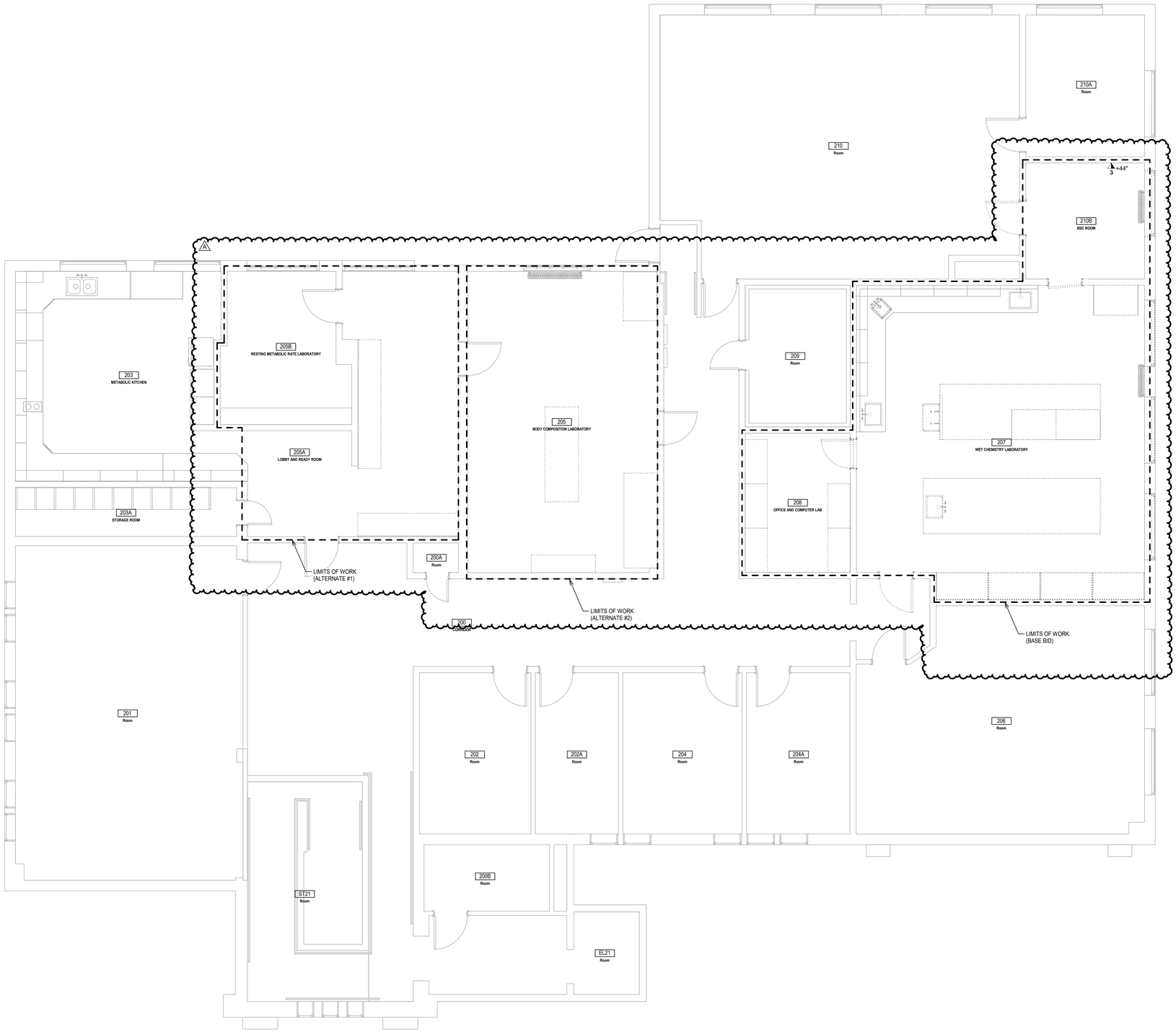
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

T0-01

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.



LEVEL 2 - DEMOLITION PLAN - TELECOM

1/4" = 1'-0"

KNIT

knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9026
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

TITLE: DEMO FLOOR PLAN - TELECOM

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE. MOSCOW, ID 83844

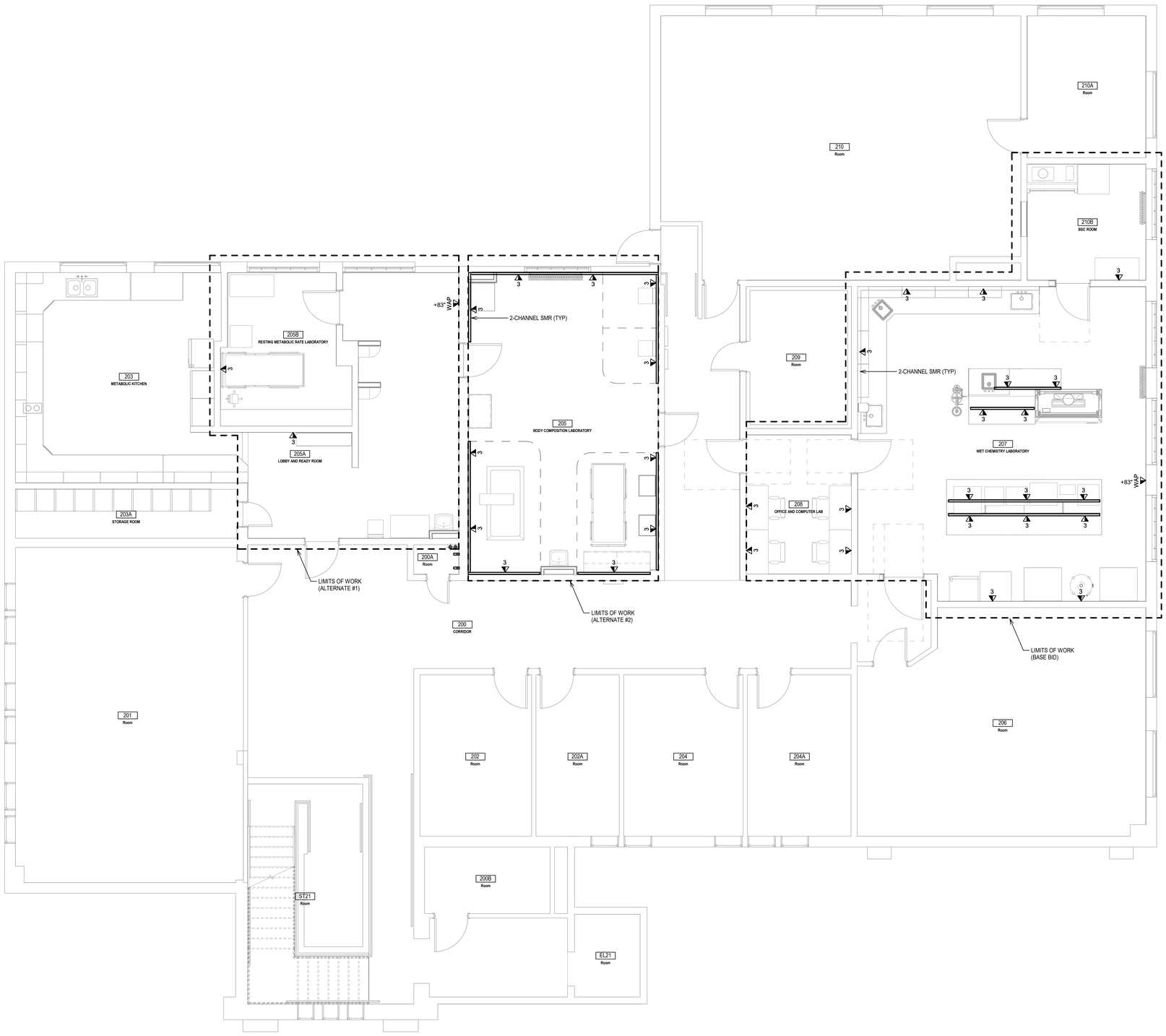
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

TD2-11

GENERAL NOTES:

1. FIELD VERIFY EXISTING CONDITIONS PRIOR TO COMMENCING WORK.
2. TELECOMMUNICATIONS PATHWAY SHALL ROUTE FROM OUTLET BOX TO ROOM 200A, THEN TRANSITION TO 4" CONDUIT FROM ROOM 200A TO EXISTING TELECOM ROOM 102. STUB CONDUIT INTO ROOM 200A AND UTILIZE J-HOOKS TO CONSOLIDATE CABLING PRIOR TO ROUTING THROUGH 4" CONDUIT.



LEVEL 2 - TELECOM

1/4" = 1'-0"

KNIT

knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.3029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOHN JOSEPH CUNNINGHAM

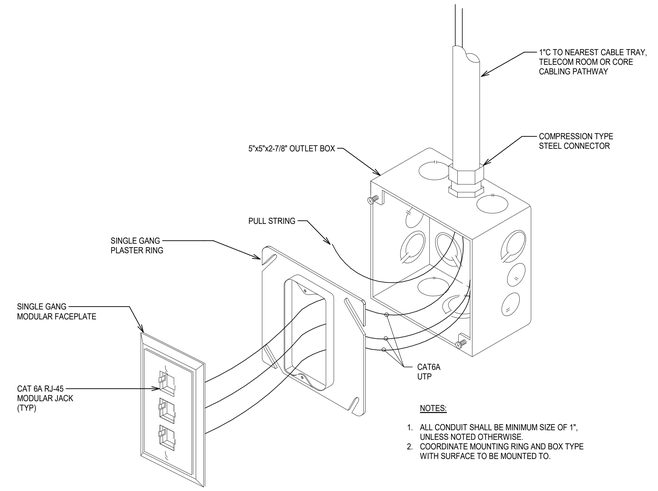
TITLE: FLOOR PLAN - TELECOM

PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844

CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

T2-11



1 TYPICAL 3-PORT OUTLET DETAIL
N.T.S.

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.1620
mwengineers.com

ISSUE DATE: **07.21.2025**

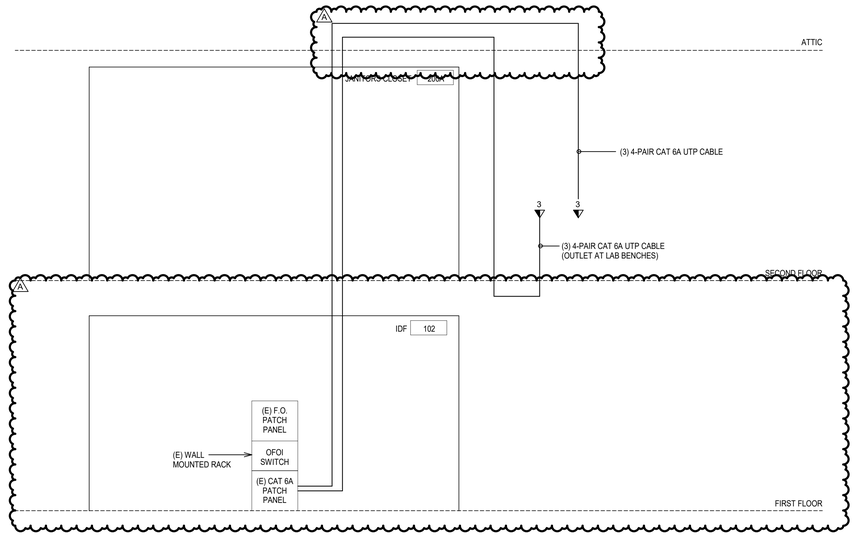
REV	DATE	COMMENT

PROFESSIONAL ENGINEER LICENSED STATE OF IDAHO JOSEPH CUNNINGHAM

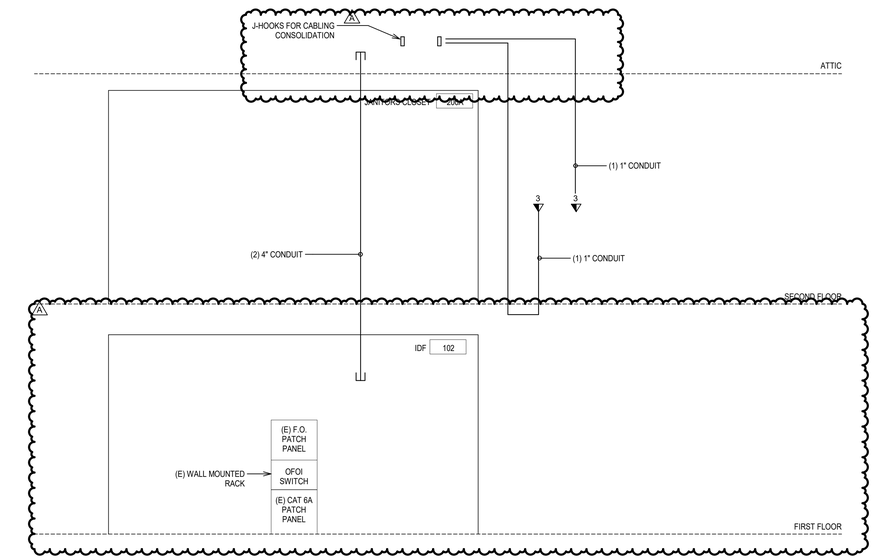
TITLE: DETAILS - TELECOM
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

T5-01



1 COPPER RISER DIAGRAM - TELECOM
N.T.S.



2 PATHWAY RISER DIAGRAM - TELECOM
N.T.S.

KNIT
knitstudios.com

MW Engineers
601 W First Ave, Ste 1300
Spokane, WA 99201, USA
509.838.9029
mwengineers.com

ISSUE DATE: **07.21.2025**

REV	DATE	COMMENT
A	7/21/2025	Owner Revisions

TITLE: RISER DIAGRAMS - TELECOM
PROJECT: FOOD RESEARCH CENTER TI - PHASE 1 (BUILDING #: 005)
860 IDAHO AVE, MOSCOW, ID 83844
CLIENT: UNIVERSITY OF IDAHO

JOB NO: **240004**
CAPITAL PROJECT NO: **CP220034**

T8-01