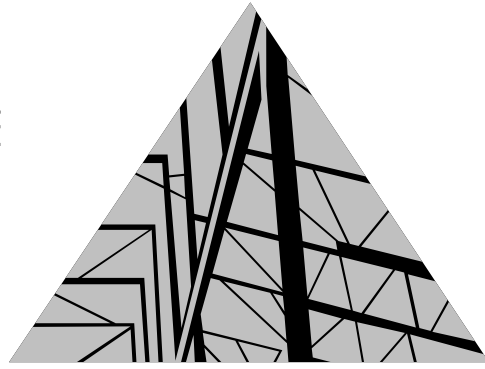




GENERAL PROJECT INFORMATION

SITE INFORMATION

TAX MAP NO.: 070905
ZONING: UNIV
FLOOD ZONE: N/A
PERMIT AUTHORITY: VIRGINIA TECH

OWNER INFORMATION

OWNER/AUTHORIZED AGENT: VIRGINIA TECH
EMILY CARROLL
PHONE: (540) 744-5282
EMAIL: EMILYCARROLL@VT.EDU

OWNER'S ADDRESS:
230 STERRETT DRIVE
BLACKSBURG, VA 24060

RENOVATIONS TO

LAB 3680 & 3683
LITTON-REAVES
VIRGINIA TECH

175 W CAMPUS DR

BLACKSBURG, VA 24061

COLLEGE OF AGRICULTURE AND LIFE SCIENCES



PROJECT PHASE:

WORKING DRAWINGS

PROJECT DATE:

11.07.2025

SPECTRUM DESIGN PROJECT NO.:

24128

INDEX OF DRAWINGS:

GENERAL

T001 COVER SHEET

ARCHITECTURAL

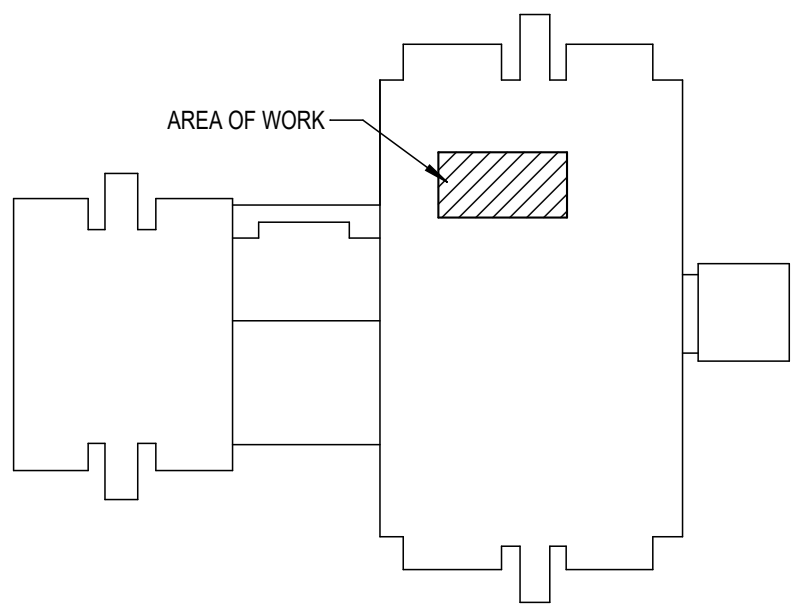
A101 DEMOLITION PLAN
A102 FLOOR PLAN & REFLECTED CEILING PLAN
A103 CASEWORK N.I.C. - FOR INFORMATION ONLY

PLUMBING

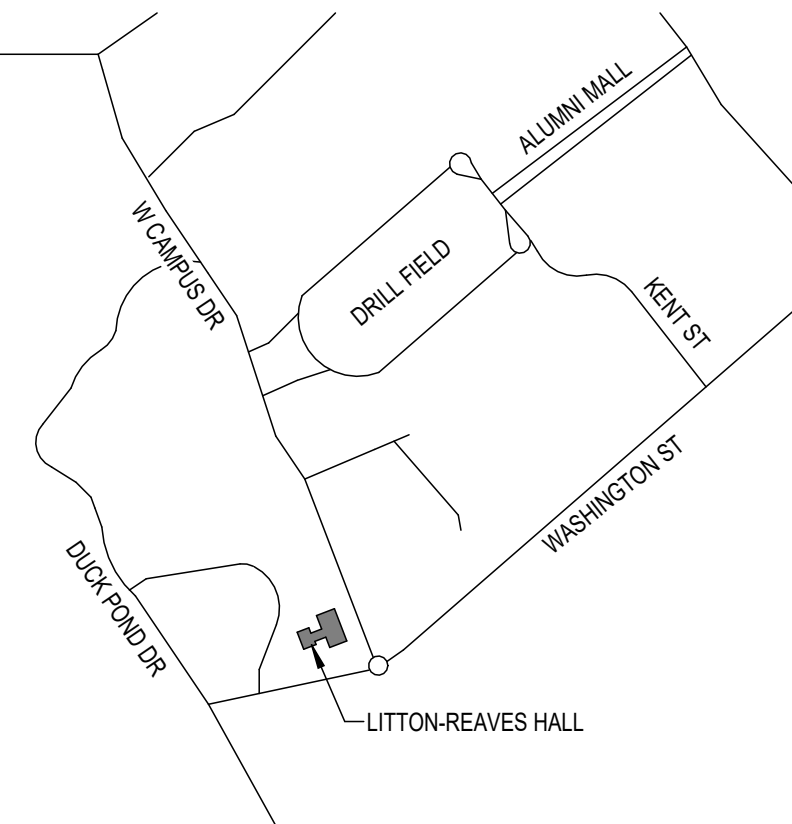
P001 PLUMBING - SPECIFICATIONS
P101 PLUMBING - NOTES, LEGEND AND FLOOR PLAN - PIPING

ELECTRICAL

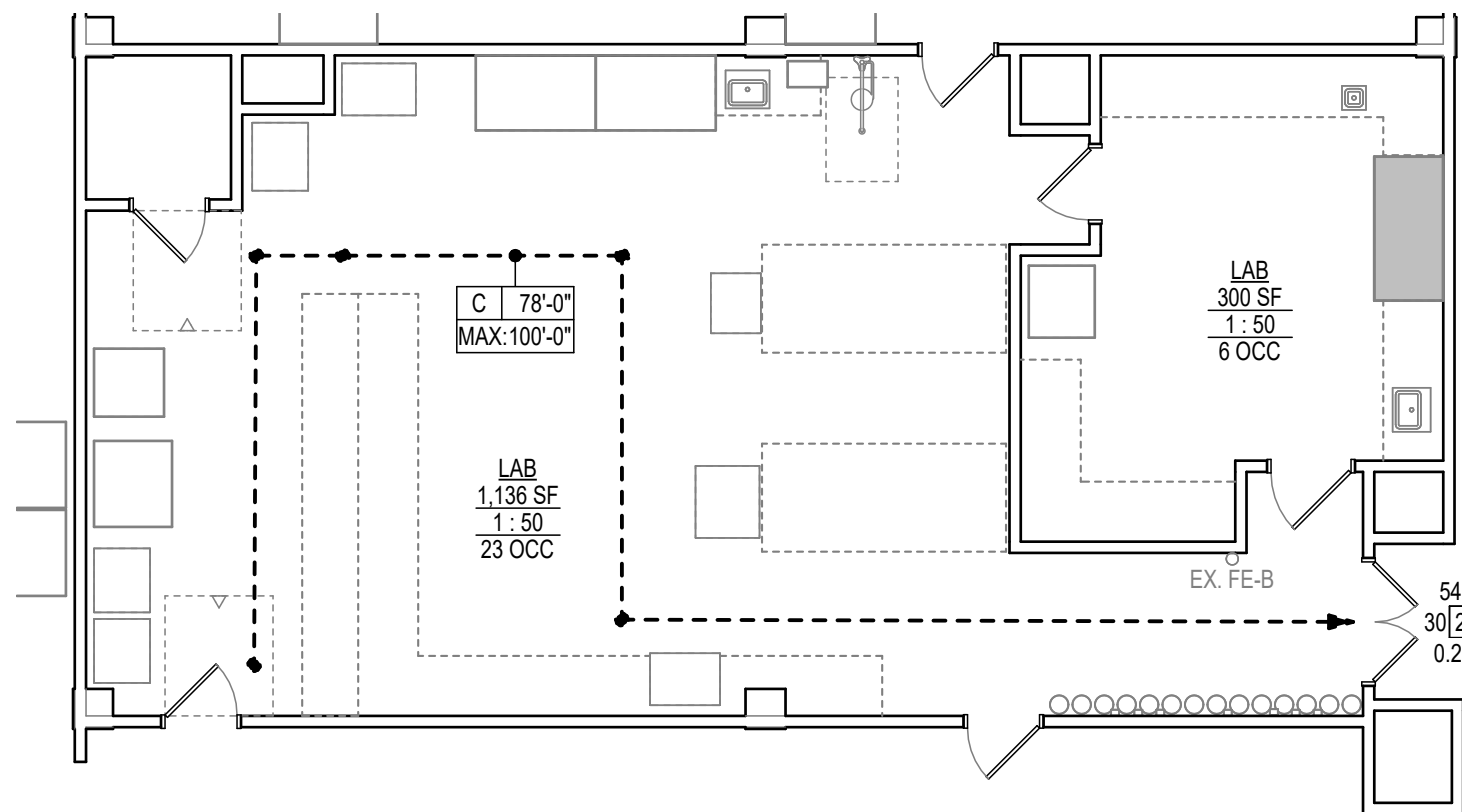
E101 ELECTRICAL LEGEND AND GENERAL NOTES AND DEMOLITION
E201 FLOOR PLAN



PROJECT SITE OR BUILDING MAP
SCALE: N.T.S.



PROJECT VICINITY
SCALE: N.T.S.



LIFE SAFETY PLAN

SCALE: 1/8" = 1'-0"

DEMOLITION OF HAZARDOUS MATERIALS

ASBESTOS: AN ASBESTOS INSPECTION WAS PERFORMED AND ACM WAS FOUND GENERALLY IN THE AREAS INDICATED. THE ASBESTOS INSPECTION REPORT IS INCLUDED AS AN APPENDIX TO THE PROJECT SPECIFICATIONS. THE VT PM SHALL SUBMIT AN APPLICATION FOR PERMIT TO HAVE THE ACM ABATED BY A LICENSED ASBESTOS CONTRACTOR USING APPROVED PROCEDURES AS SPECIFIED PRIOR TO ISSUING A NOTICE TO PROCEED TO THE GENERAL CONTRACTOR. ANY ACM THAT IS TO REMAIN AND THE NEW WORK SHALL BE LABELED ACCORDINGLY. THE ASBESTOS ABATEMENT CONTRACTOR SHALL MARK UP THE RECORD DRAWINGS RESULTING FROM ITS WORK TO INCLUDE AREAS WHERE ASBESTOS WAS ABATED AND AREAS WHERE ACM EXIST BUT WERE LEFT IN PLACE. THE GENERAL CONTRACTOR SHALL REVIEW AND CERTIFY THE LOCATIONS WHERE ACM WAS ABATED AND AREAS WHERE ACM WAS LEFT IN PLACE AS MARKED ON THE RECORD DRAWINGS AND WILL PROVIDE THE DRAWINGS TO THE AE.

LEAD: AN INSPECTION TO IDENTIFY LEAD CONTAINING OR COATED BUILDING COMPONENTS HAS BEEN CONDUCTED AND CAN BE FOUND IN THE PROJECT SPECIFICATIONS. NO LEAD-CONTAINING PAINT WAS FOUND.

LIFE SAFETY LEGEND

SPACE IDENTIFIER

SPACE NAME	AREA OF SPACE
1200 SF	AREA OF SPACE
1,136 SF	SF PER OCCUPANT
200/200	ACTUAL SEATS (IF APPLICABLE)
200/200	CALCULATED OCCUPANCY

EGRESS ELEMENTS

440/200	ALLOWABLE EGRESS CAPACITY OF OPENING
0.15'	CLEAR WIDTH OF OPENING
0.15'	ACTUAL EGRESS LOAD OF OPENING
0.15'	EGRESS CAPACITY FACTOR

TRAVEL DISTANCE

100'	PATHS OF TRAVEL
100'	COMMON PATH OF TRAVEL (Cx)
100'	DISTANCE AND DIRECTION

FIRE EXTINGUISHER & MOUNTING TYPE

FE-B	FIRE EXTINGUISHER & MOUNTING BRACKET
EX	(EXISTING)

PROJECT CODE SUMMARY

PROJECT DESCRIPTION

RENOVATION OF EXISTING LAB SPACE TO RECEIVE NEW CASEWORK

APPLICABLE BUILDING CODES

2021 VIRGINIA CONSTRUCTION CODE (VCC)
2021 VIRGINIA EXISTING BUILDING CODE (VEBC)
2021 VIRGINIA PLUMBING CODE (VPC)
2021 VIRGINIA MECHANICAL CODE (VMC)
2021 VIRGINIA ENERGY CONSERVATION CODE (VECC) CLIMATE ZONE 4A
2021 VIRGINIA STATEWIDE FIRE PREVENTION CODE (VSFPC)
2020 NATIONAL ELECTRICAL CODE (NFPA 70)
2019 STANDARD FOR INSTALLATION OF SPRINKLER SYSTEMS (NFPA 13)
2019 NATIONAL FIRE ALARM AND SIGNALING CODE (NFPA 72)
2017 STANDARD FOR ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ANSI 117.1)

BUILDING INFORMATION

BUILDING NAME: LITTON-REAVES HALL
BUILDING NUMBER: 0118
ORIGINAL BUILDING CONSTRUCTED: 1979
EXISTING USES AND OCCUPANCIES: NON-SEPARATED MIX USE: A3 - ASSEMBLY, B - BUSINESS
NEW USES AND OCCUPANCIES: NO CHANGE
NUMBER OF STORIES: 3 STORIES (NO CHANGE)
AREA PER FLOOR: NO CHANGE
TOTAL BUILDING AREA: NO CHANGE
ACTUAL WORK AREA: 1,494 SF
CONSTRUCTION TYPE: IB
AUTOMATIC SPRINKLER SYSTEM: NOT PRESENT
FIRE ALARM AND DETECTION SYSTEM: PRESENT

2021 VIRGINIA EXISTING BUILDING CODE

CLASSIFICATION OF WORK: REPAIRS (CHAPTER 5); ALTERATIONS - LEVEL 1,2 (CHAPTER 6); ALL NEW CONSTRUCTION ELEMENTS, COMPONENTS, SYSTEMS, AND SPACES SHALL COMPLY WITH THE REQUIREMENTS OF THE VCC.

CHAPTER 3 (VEBC): GENERAL PROVISIONS AND SPECIAL DETAILED REQUIREMENTS

SECTION 302.1 - EXCEPT AS OTHERWISE REQUIRED OR PERMITTED BY THIS CODE, MATERIALS PERMITTED BY THE APPLICABLE CODE FOR NEW CONSTRUCTION SHALL BE USED. LIKE MATERIALS SHALL BE PERMITTED FOR REPAIRS AND ALTERATIONS, PROVIDED NO HAZARD TO LIFE, HEALTH OR PROPERTY IS CREATED. HAZARDOUS MATERIALS SHALL NOT BE USED WHERE THE VCC WOULD NOT PERMIT THEIR USE IN BUILDINGS OR STRUCTURES OF SIMILAR OCCUPANCY, PURPOSE, AND LOCATION.

CHAPTER 4 (VEBC): ACCESSIBILITY

SECTION 404 - ALTERATIONS - THE RENOVATIONS IN THIS WORK AREA DO NOT REDUCE OR HAVE THE EFFECT OF REDUCING ACCESSIBILITY OF THE FACILITY OR PORTION OF THE FACILITY.

CHAPTER 6 (VEBC): ALTERATIONS

SECTION 602 - LEVEL 1 ALTERATIONS

SECTION 602.2 - ALL ALTERATIONS SHALL BE DONE IN A MANNER THAT MAINTAINS THE EXISTING LEVEL OF FIRE PROTECTION AND MEANS OF EGRESS.

SECTION 602.3.1 - ALL NEWLY INSTALLED INTERIOR FINISH AND TRIM MATERIALS SHALL COMPLY WITH CHAPTER 8 OF THE VCC. SEE FINISH SCHEDULE, MATERIAL FINISH NOTES.

SECTION 603 - LEVEL 2 ALTERATIONS

SECTION 603.3 - ALL LEVEL 2 ALTERATIONS SHALL COMPLY WITH LEVEL 1 ALTERATION REQUIREMENTS.

SECTION 603.4.3 - ALL NEW INTERIOR FINISH MATERIALS ARE DESIGNED TO COMPLY WITH THE VCC.

SECTION 603.5 MECHANICAL - WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH THE 2021 VIRGINIA CONSTRUCTION CODE

CHAPTER 7 (VEBC): CHANGE OF OCCUPANCY

NO CHANGE OF OCCUPANCY TO OCCUR.

CHAPTER 12 (VEBC): CONSTRUCTION SAFEGUARDS

CONTRACTOR SHALL COMPLY WITH THE 2021 VIRGINIA CONSTRUCTION CODE

NOTE: CODE ANALYSIS IS LIMITED TO THE WORK AREAS DESIGNATED.

2021 VIRGINIA CONSTRUCTION CODE

CHAPTER 3 (VCC): USE AND OCCUPANCY CLASSIFICATION

HAZARDOUS MATERIALS (SECTION 307)
THE STORED AND IN USE FLAMMABLE AND OXIDIZING GASES ARE LESS THAN THE MAXIMUM LIMIT REQUIRING A HIGH HAZARD OCCUPANCY, AS INDICATED BY THE ACTUAL QUANTITIES IN TABLE 307.1(1) BELOW. ADDITIONALLY, EXPLOSION CONTROL IS NOT REQUIRED PER VCC 414.5.1 SINCE THE QUANTITIES ARE LESS THAN THE MAXIMUM LIMIT.
PER VCC 906.1 ITEM #6, PORTABLE FIRE EXTINGUISHERS SHALL BE PROVIDED IN SPECIAL HAZARD AREAS INCLUDING LABORATORIES. THERE IS ONE EXISTING FIRE EXTINGUISHER IN THE LABORATORY SUITE, AS NOTED IN DRAWINGS. ALL TANKS TO BE SECURED TO THE WALL WITH ANCHOR STRAPS OR BRACKETS.

CHAPTER 8 (VCC): INTERIOR FINISHES

INTERIOR FINISH REQUIREMENTS (TABLE 803.13) USE GROUP B
ROOMS / ENCLOSED SPACES: CLASS C MINIMUM (NONSPRINKLERED)

CHAPTER 10 (VCC): MEANS OF EGRESS

DESIGN OCCUPANT LOAD (TABLE 1004.5):

BUSINESS (HIGHER ED VOCATIONAL) - 50 NET SF / OCCUPANT.
1,494 SF / 50 SF = 30 OCCUPANTS

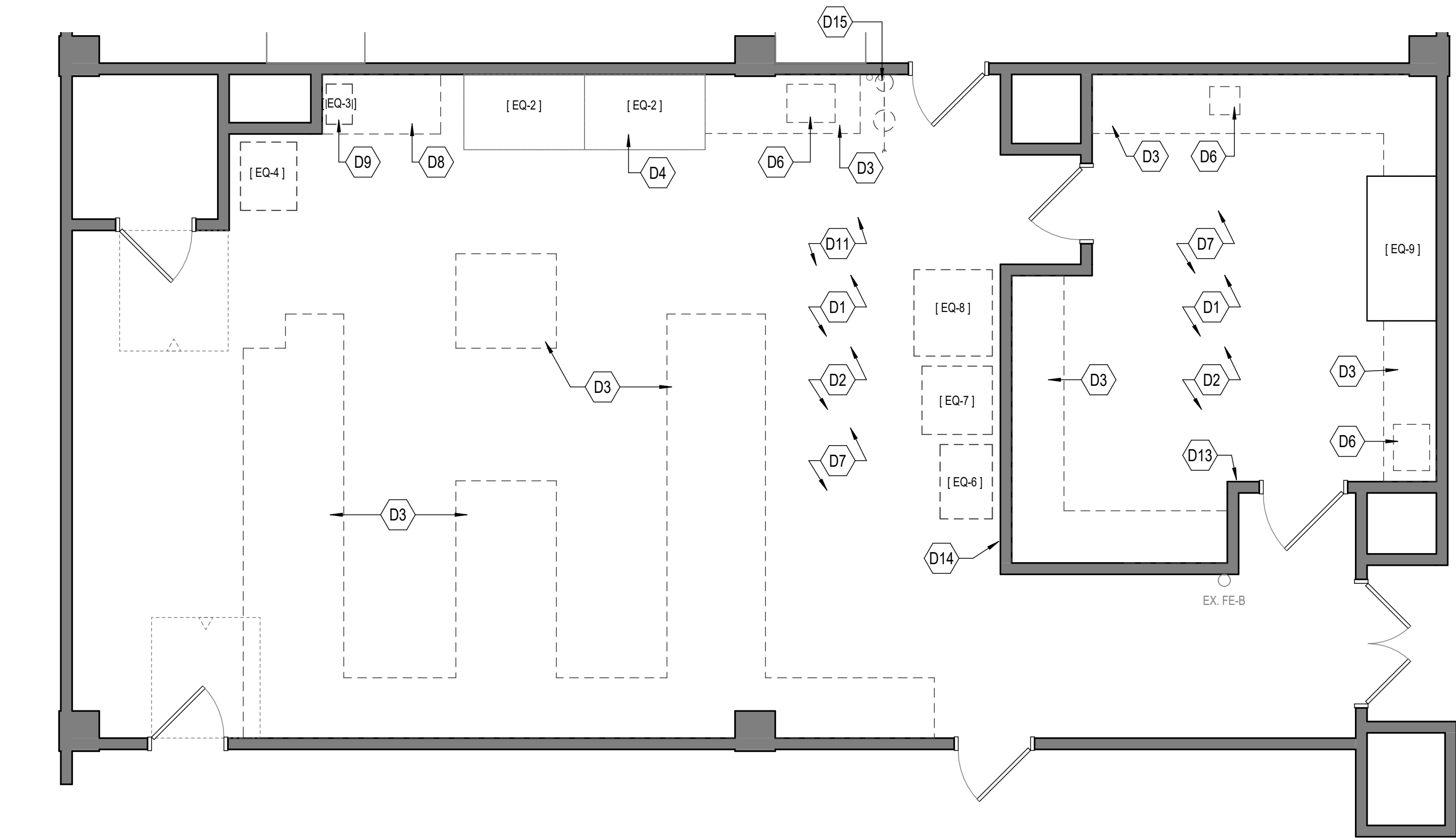
COMMON PATH OF TRAVEL (SECTION 1006.2.1) WITHOUT SPRINKLER SYSTEM = 100 FT MAX (OCC LOAD <30)
ACTUAL MAXIMUM COMMON PATH OF EGRESS TRAVEL = 87 FT

REQUIRED NUMBER OF EXITS (TABLE 1006.2.1) EXITS REQUIRED = 1; EXITS PROVIDED = 1

CHAPTER 29 (VCC): PLUMBING SYSTEMS

MINIMUM PLUMBING FACILITIES (VCC SECTION 2902 / VPC SECTION 403): NO CHANGE IN OCCUPANCY OR NUMBER OF OCCUPANTS.

TABLE 307.1(1) HIGH HAZARD									
ITEM	MATERIAL	CLASS	USE GROUP IF EXCEEDS	STORAGE GAS (CF)		STORAGE LOCATION	USE - CLOSED SYSTEM GAS (CF)		
				MAX	ACTUAL		MAX	ACTUAL	
HYDROGEN	FLAMMABLE GAS	GASEOUS	H2	1000	300	GAS CYLINDER	1000	1	1
METHANE	FLAMMABLE GAS	GASEOUS	H2	1000	300	GAS CYLINDER	1000	1	1
OXYGEN	OXIDIZING GAS	GASEOUS	H3	1500	300	GAS CYLINDER	1500	1	1
NITROGEN	INERT GAS	GASEOUS	N/A	--	--	GAS CYLINDER	--	--	--
HELIUM	INERT GAS	GASEOUS	N/A	--	--	GAS CYLINDER	--	--	--
CARBON DIOXIDE	INERT GAS	GASEOUS	N/A	--	--	GAS CYLINDER	--	--	--



1 DEMOLITION PLAN

A101 SCALE: 1/4" = 1'-0"

EQUIPMENT			
MARK	DESCRIPTION	REMARKS	QTY
EQ-2	FUME HOOD	REMAIN IN EXISTING LOCATION	2
EQ-3	WATER FILTRATION		1
EQ-4	CENTRIFUGE (BECKMAN COULTER AVANTI-J-25)		1
EQ-5	REFRIGERATOR (SAMSUNG)		1
EQ-6	ULTRA CENTRIFUGE (BECKMAN L5-80)		1
EQ-7	44 REFRIGERATOR (NORLAK EXPLOSION PROOF)		1
EQ-8	-80 FREEZER (FISHER ISOTEMP)		1
EQ-9	FUME HOOD	REMAIN IN EXISTING LOCATION	1
EQ-10	FREEZE DRYER (LABCONCO FREEZONE 6)		1
EQ-11	FREEZE DRYER (LABCONCO FREEZONE 12)		1
EQ-12	IRMS (TRACE GC ULTRADELTA V ADVANTAGE ISOTOPE RATIO MS)		1
EQ-13	GC/QUAD (ISO LIT/TRACE 1310 GAS CHROMATOGRAPH)		1
EQ-14	-20 FREEZER (FUTURE)	APPROX. SIZE	2
EQ-15	-20 FREEZER (FUTURE)	APPROX. SIZE	2
EQ-16	IN GENERATOR (FUTURE)	APPROX. SIZE - UNDERCOUNTER	1

EQUIPMENT NOTES:

1. ALL EQUIPMENT IS EXISTING. CONTRACTOR IS RESPONSIBLE FOR PROTECTING, REMOVING, STORING, AND REINSTALLING ALL EQUIPMENT IN THE LOCATIONS INDICATED.
2. CONSULT WITH VT PROJECT MANAGER FOR EQUIPMENT STORAGE LOCATION.
3. SEE ELECTRICAL DRAWINGS FOR COORDINATION OF EQUIPMENT CONNECTIONS.
4. SEE PLUMBING DRAWINGS FOR COORDINATION OF EQUIPMENT CONNECTIONS.

DEMOLITION GENERAL NOTES

- GN-1: CONTRACTOR SHALL REMOVE WALLS AND OTHER ELEMENTS SHOWN DASHED IN THEIR ENTIRETY.
- GN-2: CONTRACTOR SHALL REMOVE / DISPOSE OF ANY AND ALL DEMOLITION DEBRIS PROPERLY AND IN ITS ENTIRETY TAKING CARE TO KEEP A CLEAN AND SAFE WORKING ENVIRONMENT AT ALL TIMES.
- GN-3: CONTRACTOR SHALL ENSURE WORK IS DONE IN A COMPETENT / SAFE MANNER TAKING CARE NOT TO DAMAGE OR DISTURB SURROUNDING SURFACES MORE THAN REQUIRED TO COMPLETE DEMOLITION.
- GN-4: CONTRACTOR SHALL REMOVE EXISTING WALL MOUNTED WINDOW SHADES IN AREAS TO BE DISTURBED BY CONSTRUCTION. STORE IN A SAFE, SECURE, DRY AREA UNTIL ITEMS ARE TO BE REINSTALLED.
- GN-5: CONTRACTOR SHALL REPAIR / PREP / PRIME AND PAINT AREAS AND ADJACENT SURFACES DAMAGED OR DISTURBED BY CONSTRUCTION. MATCH ADJACENT WALL COLOR, FINISH AND TEXTURE.

DEMOLITION KEYNOTES

- D1 REMOVE EXISTING VINYL TILE AND ASSOCIATED ADHESIVE, GLUE, ETC. TO CLEAN AND BARE CONCRETE FLOOR OR SUBFLOOR.
- D2 REMOVE EXISTING CEILING TILES, CEILING GRID, GWB, BULKHEADS, CEILING INSULATION THROUGHOUT.
- D3 REMOVE ALL EXISTING CASEWORK AND ALL ASSOCIATED SHELVEING AND COUNTERTOPS.
- D4 CASEWORK AND COUNTER UNDER FUME HOOD TO REMAIN. FUME HOOD TO REMAIN IN PLACE. SUPPORT FUME HOOD AS REQUIRED FOR INSTALLATION OF NEW ADJACENT CASEWORK.
- D6 REMOVE PLUMBING FIXTURE - SUPPLY AND WASTE CONNECTIONS TO REMAIN FOR NEW WORK.
- D7 REMOVE EXISTING MECHANICAL DIFFUSERS AND GRILLES. EXISTING DUCTWORK TO REMAIN.
- D8 REMOVE EXISTING FLOOR SINK, CAP SUPPLY AND WASTE.
- D9 REMOVE EXISTING EQUIPMENT AND ASSOCIATED PLUMBING. CAP SUPPLY AND WASTE BEHIND FINISH SURFACE. EQUIPMENT TO BE RELOCATED - SEE NEW WORK PLANS FOR ADDITIONAL INFORMATION.
- D11 CAP ALL GASES UNDER THE FLOOR WITH THE EXCEPTION OF THE VACUUM WHICH SHALL REMAIN ACTIVE. SEE PLUMBING DRAWINGS.
- D13 REMOVE EXISTING LIGHT SWITCH AND ASSOCIATED WIRING AS REQ. RELOCATE TO NEW LOCATION AS INDICATED ON ELECTRICAL DRAWINGS.
- D14 REMOVE EXISTING THERMOSTAT, WIRING AND JUNCTION BOX TO REMAIN. STORE THERMOSTAT FOR REINSTALLATION IN NEW LOCATION. SEE NEW FLOOR PLAN FOR NEW LOCATION.
- D15 REMOVE EXISTING SAFETY SHOWER AND EYE WASH. PREPARE LOCATION FOR NEW SAFETY SHOWER AND EYE WASH IN SIMILAR LOCATION. SEE NEW WORK PLAN FOR ADDITIONAL INFORMATION.

RENOVATIONS TO LITTON-REAVES LAB 3680 & 3683 VIRGINIA TECH

SPECTRUM DESIGN PROJECT NO.: 24128



PROJ. MGR.: **JM** CHECKED BY: **TLR** DRAWN BY: **LAC**

SHEET ISSUE DATE:
11.07.2025

PROJECT PHASE:
WORKING DRAWINGS

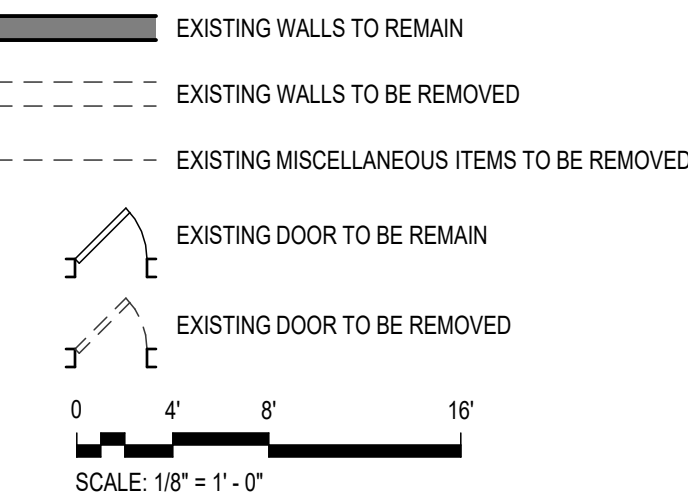
SHEET REVISIONS:

DEMOLITION OF HAZARDOUS MATERIALS

ASBESTOS: AN ASBESTOS INSPECTION WAS PERFORMED AND ACM WAS FOUND GENERALLY IN THE AREA(S) INDICATED. THE ASBESTOS INSPECTION REPORT IS INCLUDED AS AN APPENDIX TO THE PROJECT SPECIFICATIONS. THE VT PM SHALL SUBMIT AN APPLICATION FOR PERMIT TO HAVE THE ACM ABATED BY A LICENSED ASBESTOS CONTRACTOR USING APPROVED PROCEDURES AS SPECIFIED PRIOR TO ISSUING A NOTICE TO PROCEED TO THE GENERAL CONTRACTOR. ANY ACM THAT IS TO REMAIN AND THE NEW NON-ACM SHALL BE LABELED ACCORDINGLY. THE ASBESTOS ABATEMENT CONTRACTOR SHALL MARK UP THE RECORD DRAWINGS RESULTING FROM ITS WORK TO INCLUDE AREAS WHERE ASBESTOS WAS ABATED AND AREAS WHERE ACM EXIST BUT WERE LEFT IN PLACE. THE GENERAL CONTRACTOR SHALL REVIEW AND CERTIFY THE LOCATIONS WHERE ACM WAS ABATED AND AREAS WHERE ACM WAS LEFT IN PLACE AS MARKED ON THE RECORD DRAWINGS AND WILL PROVIDE THE DRAWINGS TO THE A/E.

LEAD: AN INSPECTION TO IDENTIFY LEAD CONTAINING OR COATED BUILDING COMPONENTS HAS BEEN CONDUCTED AND CAN BE FOUND IN THE PROJECT SPECIFICATIONS. NO LEAD-CONTAINING PAINT WAS FOUND.

DEMOLITION LEGEND

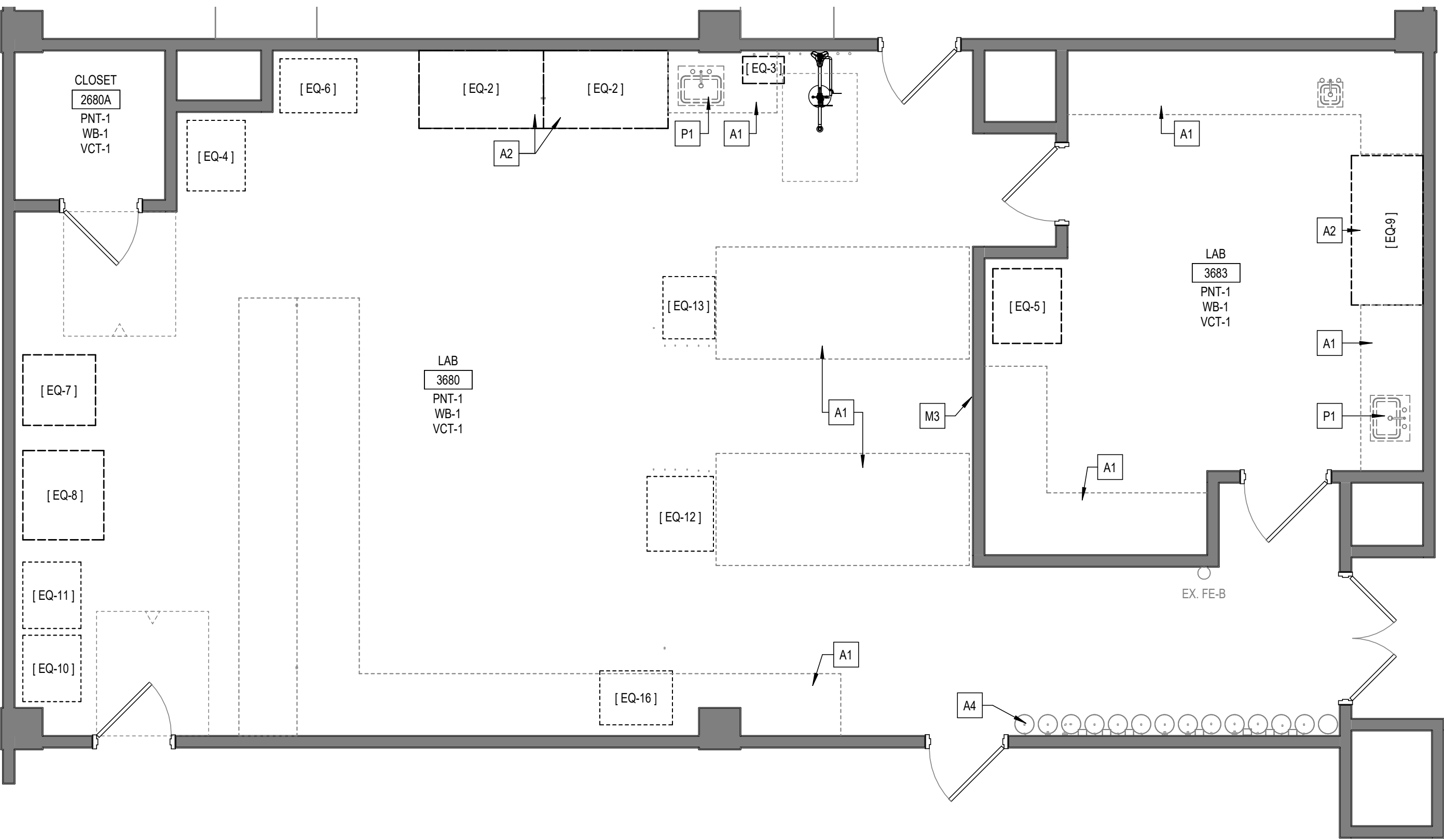


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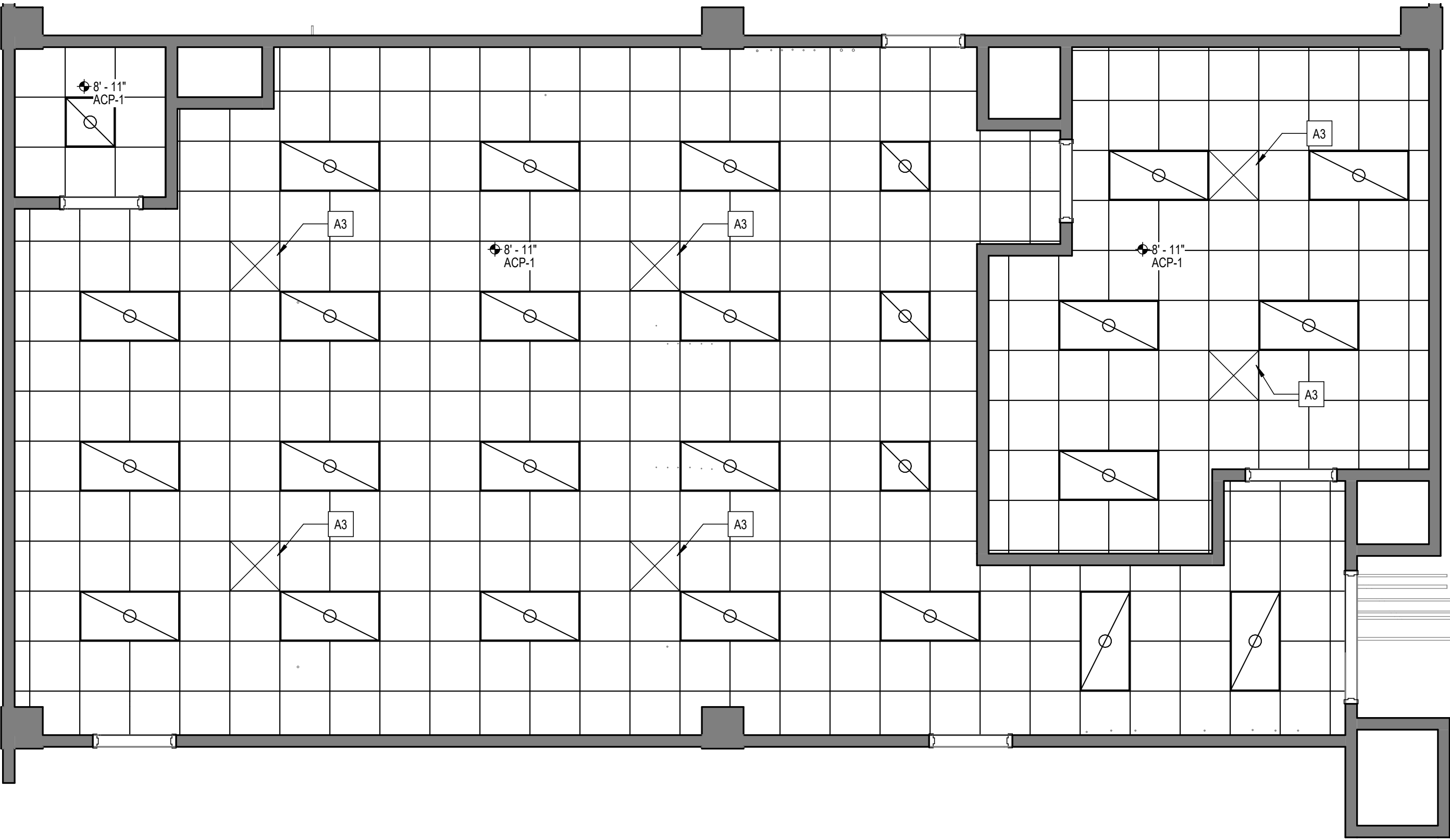
DEMOLITION PLAN

SHEET NUMBER:

A101



1 FLOOR PLAN
A102 SCALE: 1/4" = 1'-0"



2 REFLECTED CEILING PLAN
A102 SCALE: 1/4" = 1'-0"

EQUIPMENT			
MARK	DESCRIPTION	REMARKS	QTY
EQ-2	FUME HOOD	REMAIN IN EXISTING LOCATION	2
EQ-3	WATER FILTRATION		1
EQ-4	CENTRIFUGE (BECKMAN COULTER AVANTI-J-26)		1
EQ-5	REFRIGERATOR (SAMSUNG)		1
EQ-6	ULTRA CENTRIFUGE (BECKMAN L8-80)		1
EQ-7	44 REFRIGERATOR (NOR-LAKE EXPLOSION PROOF)		1
EQ-8	30 FREEZER (FISHER ISOTEMP)		1
EQ-9	FUME HOOD	REMAIN IN EXISTING LOCATION	1
EQ-10	FREEZE DRYER (LABCONCO FREEZONE 6)		1
EQ-11	FREEZE DRYER (LABCONCO FREEZONE 12)		1
EQ-12	IRMS (TRACE GC ULTRADELTA V ADVANTAGE ISOTOPE RATIO MS)		1
EQ-13	GC/QUAD (ISO LT/TRACE 1310 GAS CHROMATOGRAPH)		1
EQ-14	20 FREEZER (FUTURE)	APPROX. SIZE	2
EQ-15	20 FREEZER (FUTURE)	APPROX. SIZE	2
EQ-16	N GENERATOR (FUTURE)	APPROX. SIZE - UNDERCOUNTER	1

EQUIPMENT NOTES:
1. ALL EQUIPMENT IS EXISTING. CONTRACTOR IS RESPONSIBLE FOR PROTECTING, REMOVING, STORING, AND REINSTALLING ALL EQUIPMENT IN THE LOCATIONS INDICATED.
2. CONSULT WITH VT PROJECT MANAGER FOR EQUIPMENT STORAGE LOCATION.
3. SEE ELECTRICAL DRAWINGS FOR COORDINATION OF EQUIPMENT CONNECTIONS.
4. SEE PLUMBING DRAWINGS FOR COORDINATION OF EQUIPMENT CONNECTIONS.

ROOM FINISH SCHEDULE							
ROOM NO.	ROOM NAME	FLOOR FINISH	WALL		CEILING		REMARKS
			BASE	FINISH	MATERIAL	FINISH	
THIRD FLOOR							
2880A	CLOSET	VCT-1	WB-1	PNT-1	ACP-1	-	
3680	LAB	VCT-1	WB-1	PNT-1	ACP-1	-	
3683	LAB	VCT-1	WB-1	PNT-1	ACP-1	-	

ROOM FINISH LEGEND				
TAG	SUPPLIER/ MANUFACTURER	PATTERN/ PRODUCT	COLOR NAME	REMARKS
09 51 00	ACOUSTICAL CEILINGS			
ACP-1	ARMSTRONG	FINE FISSURED 24X24, REGULAR EDGE	WHITE	
09 65 00	RESILIENT FLOORING			
VCT-1	ARMSTRONG FLOORING	STANDARD EXCELON IMPERIAL TEXTURE	STERLING 51904	
WB-1	TARKETT	4" COVE	CHARCOAL	WALL BASE
09 90 00	PAINTING AND COATING			
PNT-1	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW 7008 ALABASTER	WALL - FIELD COLOR
PNT-2	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW 7029 AGREEABLE GRAY	FUME HOOD
PNT-TRIM	SHERWIN WILLIAMS	SEE SPECIFICATIONS	SW 7069 IRON ORE	HW DOORS AND FRAMES

FLOOR PLAN GENERAL NOTES

- GN-1: DIMENSION GUIDELINES:
• NEW CONSTRUCTION = PLAN DIMENSIONS ARE TO FACE OF FRAMING MEMBERS AT GWB, FACE OF MASONRY, AND CENTERLINE OF STRUCTURAL GRID U.N.O.
• EXISTING CONSTRUCTION = PLAN DIMENSIONS ARE TO FACE OF FINISH OF EXISTING WALLS TO REMAIN U.N.O.
• PLUMBING FIXTURES = PLAN DIMENSIONS ARE FROM FACE OF FINISH (GWB, TILE, ETC.) TO CENTERLINE OF FIXTURE.
• "CLEAR" = DIMENSIONS ARE TO FACE OF FINISH (GWB, TILE, ETC).
GN-2: WHERE PARTITIONS OF DIFFERENT THICKNESSES ABUT OR ADJOIN IN THE SAME LOCATION, THE EXPOSED / FINISH FACES SHALL BE INSTALLED FLUSH / ALIGNED.
GN-3: SEE LIFE SAFETY PLANS FOR FIRE EXTINGUISHER CABINET TYPES AND LOCATIONS.

REFLECTED CEILING GENERAL NOTES

- GN-1: MECHANICAL SUPPLY AND RETURN GRILLES, ELECTRICAL FIXTURES AND EQUIPMENT, AND SPRINKLER HEADS (NOT SHOWN) TO BE CENTERED IN ACP OR WITHIN SPACE AT GWB CEILINGS.
GN-2: DIMENSION GUIDELINES:
• REFLECTED CEILING PLAN DIMENSIONS ARE FROM FACE OF WALL FINISH (GWB, CMU, ETC.) TO FACE OF BULKHEAD FINISH: CENTERLINE OF ACP GRID, CENTERLINE OF STRUCTURAL GRID, ETC. U.N.O.
GN-3: REFER TO ELECTRICAL DRAWINGS FOR WALL MOUNTED AND UNDER CABINET FIXTURES AND SPEAKERS NOT INDICATED ON RCP.
GN-4: AT LOCATIONS WHERE ACP WILL BE 6" OR LESS IN WIDTH, USE A 2X4 ACP OF THE SAME TYPE AND MANUFACTURER. FOR EXAMPLE: IN LIEU OF A 6"X24" ACP NEXT TO A 24"X24" ACP, THE PANEL SHALL BE 30"X24" AND EXTEND TO THE WALL OR SOFFIT.
GN-5: PROVIDE ACCESS PANELS FOR ABOVE CEILING ACCESS AT GWB CEILINGS WHERE REQUIRED. SEE PLUMBING, MECHANICAL AND ELECTRICAL DRAWINGS FOR EQUIPMENT REQUIRING ACCESS PANELS.

MECHANICAL NOTES

- GN-1: MATCH EXISTING NECK SIZE.
GN-2: MATCH EXISTING FACE SIZE.
GN-3: PROVIDE MINIMUM 1-5" THICK FIBERGLASS BLANKET INSULATION WITH VAPOR RETARDER JACKET (F/SK) SECURELY TAPED TO THE BACKSIDE OF ALL SUPPLY DIFFUSERS INSTALLED IN LAY-IN CEILING ASSEMBLIES TO PROHIBIT FORMATION OF CONDENSATE ON DIFFUSER SURFACE.

SUPPLY DIFFUSERS - STEEL, 3-CONE, 4 WAY DISCHARGE, WHITE FINISH BASIS OF DESIGN - PRICE SCD OR APPROVE EQUAL.

CEILING RETURNS - STEEL, LOUVERED GRILLS, 3/4" BLADE SPACING, 0" BLADE DEFLECTION, WHITE FINISH

XX SHEET KEYNOTES

- A1 CASEWORK IS OWNER PROVIDED, CONTRACTOR INSTALLED. COORDINATE WITH ELECTRICAL AND PLUMBING DRAWINGS. SEE DRAWINGS ON SHEET A103 FOR ADDITIONAL OWNER PROVIDED CASEWORK AND EQUIPMENT INFORMATION.
A2 PAINT EXTERIOR OF EXISTING FUME HOOD PNT-2. PREPARE SURFACE AND APPLY PAINT PER SPECIFICATIONS. PROTECT/COVER ALL SWITCHES, OUTLETS, HARDWARE, PLATES, INSTRUCTIONAL/WARNING TAGS, AND SURROUNDING SURFACES DURING PAINTING.
A3 INSTALL NEW MECHANICAL SUPPLY DIFFUSERS AND GRILLES IN EXISTING LOCATIONS. RECONNECT TO EXISTING DUCTWORK. MATCH NEW GRID LOCATIONS.
A4 PROVIDE WALL MOUNT GAS CYLINDER SUPPORT BRACKET WITH FOURTEEN (14) POLYPROPYLENE STRAPS WITH CINCH BUCKLES CAPABLE OF HOLDING 12" DIA. CYLINDERS. CENTER ON WALL. RELOCATE EXISTING THERMOSTAT TO THIS LOCATION. PROVIDE SURFACE MOUNTED JUNCTION BOXES, SURFACE MOUNTED RACEWAY, AND NEW WIRING AS REQUIRED TO CONNECT THERMOSTAT TO WIRING AT PREVIOUS LOCATION.
P1 SINK IN CASEWORK IS OWNER PROVIDED, CONTRACTOR INSTALLED. SEE DRAWINGS ON SHEET A103 FOR ADDITIONAL INFORMATION. COORDINATE WITH PLUMBING DRAWINGS.

REFLECTED CEILING PLAN LEGEND

- SUSPENDED ACOUSTICAL CEILING PANEL SYSTEM (ACP)
24X LIGHT FIXTURE, RE: ELEC
2X2 LIGHT FIXTURE, RE: ELEC
HVAC SUPPLY DIFFUSER, RE: MECH
HVAC RETURN GRILLE, RE: MECH
ABOVE FINISH FLOOR (A.F.F.)

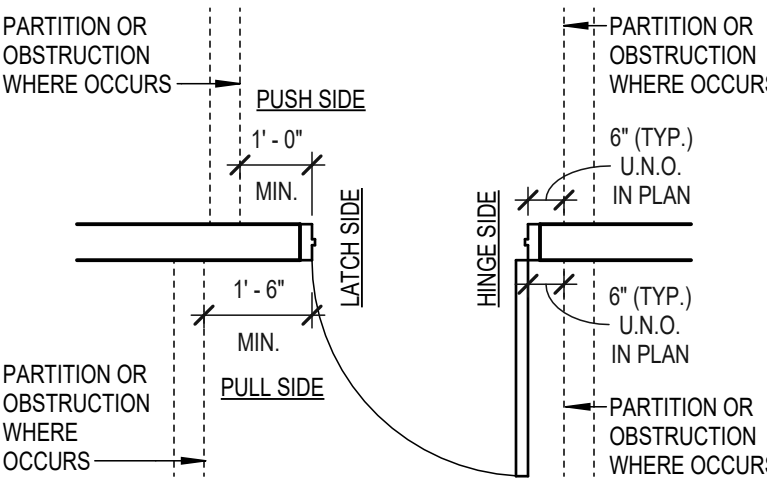
REFLECTED CEILING PLAN WALL LEGEND

- WALLS AND PARTITIONS TERMINATING ABOVE CEILING
INTERIOR PARTITIONS TERMINATING BELOW CEILING

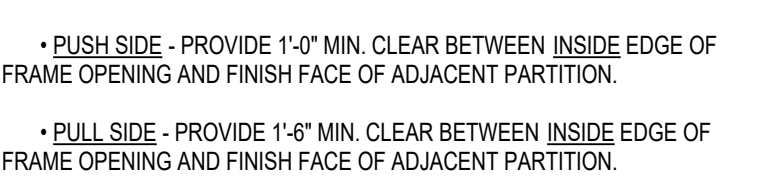
FLOOR PLAN WALL LEGEND

- EXISTING WALLS TO REMAIN
NEW WALLS TO BE CONSTRUCTED
EXISTING DOOR
NEW DOOR

MINIMUM DOOR CLEARANCE LEGEND



ANSI 117.1 2017
WHERE LATCH SIDE OF DOORWAYS ARE LOCATED ADJACENT TO A PERPENDICULAR PARTITION (AND NOT OTHERWISE DIMENSIONED):
• PUSH SIDE - PROVIDE 1'-0" MIN. CLEAR BETWEEN INSIDE EDGE OF FRAME OPENING AND FINISH FACE OF ADJACENT PARTITION.
• PULL SIDE - PROVIDE 1'-6" MIN. CLEAR BETWEEN INSIDE EDGE OF FRAME OPENING AND FINISH FACE OF ADJACENT PARTITION.

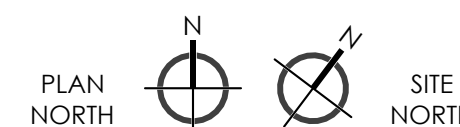




**RENOVATIONS TO
LITTON-REAVES
LAB 3680 & 3683
VIRGINIA TECH**

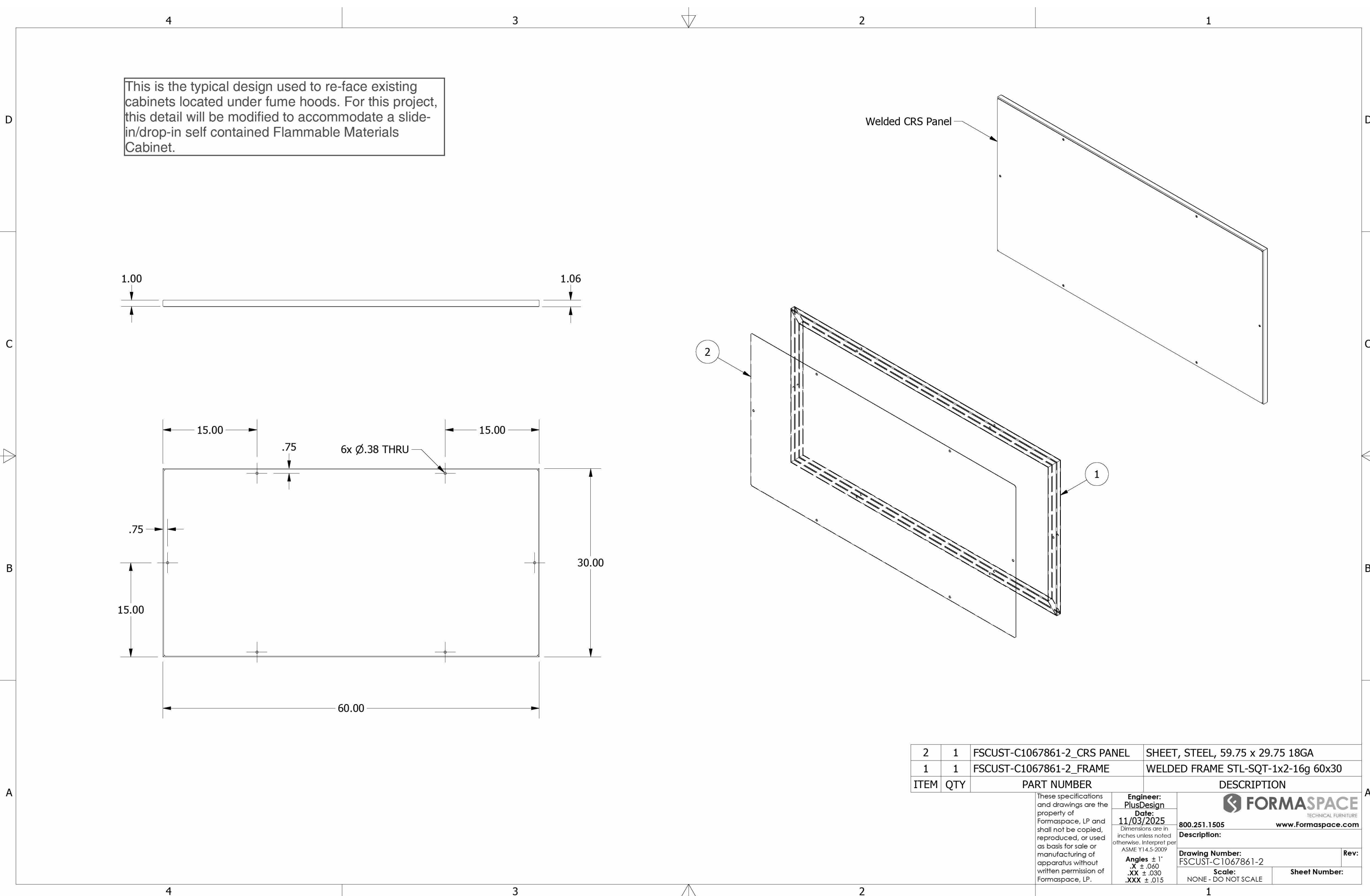
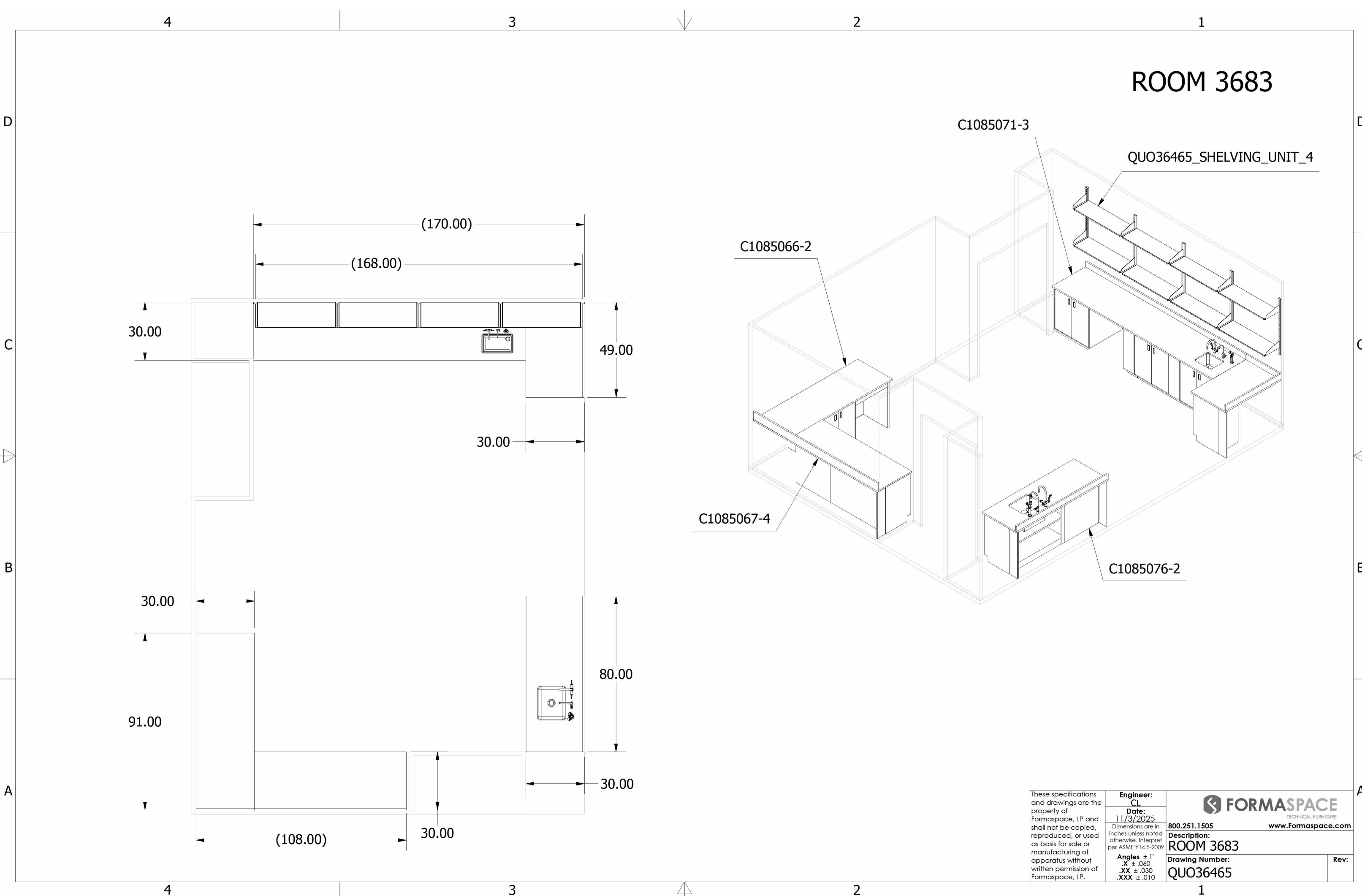
COMMONWEALTH OF VIRGINIA
Travis Rookstool
 TRAVIS ROOKSTOOL
 Lic. No. 17288
 11.07.2025
 ARCHITECT

SHEET REVISIONS:



SHEET NUMBER

A103



PLUMBING SPECIFICATIONS

1. DEMOLITION

A. SEE ARCHITECTURE FOR DEMOLITION.

2. SUBMISSION OF SHOP DRAWINGS, PRODUCT DATA, SAMPLES AND PROJECT INFORMATION

A. IDENTIFY ALL PLUMBING SHOP DRAWINGS, PRODUCT DATA AND SAMPLES WITH THE NAME OF THE PROJECT. CLEARLY MARK THE SPECIFIC ITEMS INTENDED FOR USE. SUBMIT ALL RELATED ITEMS AT ONE TIME.

B. PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, SUBMIT THE FOLLOWING INFORMATION FOR REVIEW AND APPROVAL. (1) OPERATING AND MAINTENANCE INSTRUCTIONS. (2) "AS BUILT" DRAWINGS.

3. GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF ACCEPTANCE AND CONTRACTOR SHALL MAKE GOOD, WITHOUT ADDITIONAL COST TO THE OWNER, ANY DEFECTS WHICH MAY APPEAR WITHIN THAT PERIOD. MANUFACTURER'S WARRANTIES EXTENDING BEYOND ONE YEAR SHALL BE PROCESSED AND TURNED OVER TO THE OWNER.

4. "AS BUILT" DRAWINGS: CONTRACTOR SHALL KEEP AN ACCURATE RECORD OF THE LOCATION OF ALL CONCEALED PIPING, VALVES, CONTROLS, ETC., BOTH INTERIOR AND EXTERIOR. ON COMPLETION OF THE WORK, ONE PRINT EACH OF THE CONTRACT DRAWINGS WHICH ARE APPLICABLE SHALL BE NEATLY AND CLEARLY MARKED IN COLOR TO SHOW ALL VARIATIONS BETWEEN THE WORK ACTUALLY PROVIDED AND THAT INDICATED ON THE CONTRACT DRAWINGS
5. OPERATING AND MAINTENANCE MANUALS

A. GENERAL: PRIOR TO COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE TWO HARDBACKED LOOSELEAF RING TYPE BINDERS, IDENTIFIED WITH THE NAME OF THE PROJECT. CONTRACTOR SHALL DELIVER THESE BINDERS TO THE ENGINEER FOR REVIEW AND TRANSMITTAL TO THE OWNER.

B. THE FOLLOWING ITEMS AND OTHER ADDITIONAL PERTINENT DATA FOR EACH ITEM OF EQUIPMENT SHALL BE INCLUDED:

(1) NAME OF MANUFACTURER.

(2) NAME, ADDRESS AND TELEPHONE NUMBER OF NEAREST MANUFACTURER'S REPRESENTATIVE.

(3) COPY OF LATEST APPROVED SHOP DRAWING.

(4) MANUFACTURER'S OPERATING AND MAINTENANCE MANUAL INCLUDING LUBRICATION DATA.

(5) PARTS NUMBERS FOR ALL REPLACEABLE ITEMS.

(6) SERIAL NUMBERS OF ALL PRINCIPAL ITEMS OF EQUIPMENT.

(7) CONTROL DIAGRAMS AND SEQUENCE OF OPERATION.

(8) MANUFACTURER'S WRITTEN GUARANTEES THAT EXTEND BEYOND THE CONTRACTOR'S ONE YEAR GUARANTEE.

C. THE OPERATING AND MAINTENANCE MANUALS SHALL BE CONSIDERED A PART OF THE FINAL INSPECTION AND THEY SHALL BE SUBMITTED FOR APPROVAL AT LEAST THIRTY (30) DAYS PRIOR TO REQUEST FOR FINAL INSPECTION.
6. IDENTIFICATION

A. PIPE MARKERS

(1) COLOR: CONFORM TO ASME A13.1.

(2) PLASTIC PIPE MARKERS: FACTORY FABRICATED, FLEXIBLE, SEMI-RIGID PLASTIC, PREFORMED TO FIT AROUND PIPE OR PIPE COVERING; MINIMUM INFORMATION INDICATING FLOW DIRECTION ARROW AND IDENTIFICATION OF FLUID BEING CONVEYED.

B. INSTALLATION

(1) IDENTIFY PIPING, CONCEALED OR EXPOSED, WITH PLASTIC PIPE MARKERS. IDENTIFY SERVICE, FLOW DIRECTION, AND PRESSURE. INSTALL IN CLEAR VIEW AND ALIGN WITH AXIS OF PIPING. LOCATE IDENTIFICATION NOT TO EXCEED 20 FEET (6 M) 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.

7. PIPING SPECIALTIES

A. PIPE ESCUTCHEONS: INSTALL PIPE ESCUTCHEONS ON EACH PIPE PENETRATION THRU FLOORS, WALLS PARTITIONS, AND CEILINGS WHERE PENETRATION IS EXPOSED TO VIEW AND ON EXTERIOR OF BUILDING. SECURE ESCUTCHEON TO PIPE OR INSULATION SO ESCUTCHEON COVERS PENETRATION HOLE, AND IS FLUSH WITH ADJOINING SURFACE. PROVIDE SHEET STEEL ESCUTCHEONS, SOLID OR SPLIT HINGED. FOR AREAS WHERE WATER AND CONDENSATION CAN BE EXPECTED TO ACCUMULATE, PROVIDE CAST BRASS OR SHEET BRASS ESCUTCHEONS. SOLID TYPE, SPLIT HINGED TYPE IS NOT ALLOWED.

B. PIPE SLEEVES: INSTALL PIPE SLEEVES WHERE PIPING PASSES THROUGH WALLS, FLOORS, CEILINGS, AND ROOFS. DO NOT INSTALL SLEEVES THROUGH STRUCTURAL MEMBERS OF WORK, EXCEPT AS DETAILED ON DRAWINGS, OR AS REVIEWED BY ARCHITECT/ENGINEER. SIZE SLEEVES SO THAT PIPING AND INSULATION (IF ANY) WILL HAVE FREE MOVEMENT IN SLEEVE, ALLOWANCE FOR THERMAL EXPANSION; BUT NOT LESS THAN 2 PIPE SIZES LARGER THAN PIPING RUN. INSTALL LENGTH OF SLEEVE EQUAL TO THICKNESS OF CONSTRUCTION PENETRATED, AND FINISH FLUSH TO SURFACE; EXCEPT FLOOR SLEEVES. EXTEND FLOOR SLEEVES 1/4 INCH ABOVE LEVEL FLOOR FINISH, AND 3/4 INCH ABOVE FLOOR FINISH SLOPED TO DRAIN. PROVIDE TEMPORARY SUPPORT OF SLEEVES DURING PLACEMENT OF CONCRETE AND OTHER WORK AROUND SLEEVES, AND PROVIDE TEMPORARY CLOSURE TO PREVENT CONCRETE AND OTHER MATERIALS FROM ENTERING SLEEVES.
- C. SOIL, WASTE AND VENT PIPING ABOVE GRADE SIZE: ALL PIPE: SERVICE WEIGHT CAST IRON ASTM A-74 OR HUBLESS ASTM C-564 OR SCH. 40 PVC-DIWV ASTM D-2665 FITTINGS: SERVICE WEIGHT OR HUBLESS CAST IRON. JOINTS: HUB & SPIGOT CAULKED, COMPRESSION GASKETS OR NEOPRENE SLEEVES AND STAINLESS STEEL BANDS FOR CAST IRON.

8. PIPE INSULATION

(1) INSULATION OMITTED: OMIT INSULATION ON EXPOSED PLUMBING FIXTURE RUNOUTS FROM FACES OF WALL OR FLOOR TO FIXTURE, ON UNIONS, FLANGES, STRAINERS, FLEXIBLE CONNECTIONS, AND EXPANSION JOINTS.

(2) COVER VALVES, FITTINGS AND SIMILAR ITEMS IN EACH PIPING SYSTEM WITH EQUIVALENT THICKNESS AND COMPOSITION OF INSULATION AS APPLIED TO ADJOINING PIPE RUN.

(3) EXTEND PIPING INSULATION WITHOUT INTERRUPTION THROUGH WALLS, FLOORS AND SIMILAR PIPING PENETRATIONS, EXCEPT WHERE OTHERWISE INDICATED.

(4) INSTALL PROTECTIVE METAL SHIELDS AND INSULATED INSERTS WHEREVER NEEDED TO PREVENT COMPRESSION OF INSULATION.

(5) PIPE HANGER INSULATION INSERTS: BUTT PIPE INSULATION AGAINST PIPE INSULATION INSERTS. FOR HOT PIPES, APPLY 3 INCH WIDE VAPOR BARRIER TAPE OR BAND OVER THE BUTT JOINTS. FOR COLD PIPING APPLY WET COAT OF VAPOR BARRIER LAP CEMENT ON BUTT JOINTS AND SEAL JOINTS WITH 3 INCH WIDE VAPOR BARRIER TAPE OR BAND.

(6) DOMESTIC WATER PIPING, ABOVE GROUND: PIPING SHALL BE INSULATED WITH GLASS FIBER PIPE INSULATION. CLOSED CELLULAR FOAM OR POLYETHYLENE PIPE INSULATION MAY BE USED ON PIPE SIZES 1 INCH AND SMALLER. VAPOR SEAL IS NOT REQUIRED ON HOT WATER PIPING.

MATERIAL HANDLED	PIPE SIZE	INSULATION THICKNESS
COLD WATER	1-1/2" & SMALLER 1-1/2" LARGER	1/2" 1"
HOT WATER AND HOT WATER RECIRCULATING	1" & SMALLER 1-1/2" & LARGER	1" 1-1/2"

9. PLUMBING PIPING

A. DOMESTIC WATER PIPING ABOVE GROUND

PIPE: TYPE L, HARD DRAWN COPPER FITTINGS, CAST BRONZE OR WROUGHT COPPER

JOINTS: SOLDERED USING TIN-ANTIMONY (95-5) SOLDER OR PRESS-FIT.

10. PLUMBING VALVES

A. PROVIDE SHUT-OFF VALVE AND UNION OR EQUIVALENT AT EACH HOT AND COLD WATER EQUIPMENT CONNECTION. PROVIDE SHUT-OFF VALVE ON EACH BRANCH OR RISER THAT SERVES TWO OR MORE PLUMBING FIXTURES.

B. BALL VALVES SHALL BE USED IN LIEU OF GATE VALVES 2 INCHES AND SMALLER. BALL VALVES SHALL HAVE BRONZE BODY, BRONZE BALL AND TFE SEATS AND SEALS. STOCKHAM S-216BRRT OR S-216BRRS.

11. PLUMBING FIXTURES

A. CODES AND STANDARDS: COMPLY WITH APPLICABLE PORTIONS OF NATIONAL STANDARD PLUMBING CODE PERTAINING TO MATERIALS AND INSTALLATION OF PLUMBING FIXTURES.

(1) ANSI STANDARDS: COMPLY WITH APPLICABLE ANSI STANDARDS PERTAINING TO PLUMBING FIXTURES AND SYSTEMS.

(2) PDI COMPLIANCE: COMPLY WITH STANDARDS ESTABLISHED BY PDI PERTAINING TO PLUMBING FIXTURE SUPPORTS.

(3) FEDERAL STANDARDS: COMPLY WITH APPLICABLE FS WW-P-541/SERIES SECTIONS PERTAINING TO PLUMBING FIXTURES.

B. ALL EXPOSED FIXTURE SUPPLIES AND WASTE LINES SHALL BE CHROME PLATED. NO EXPOSED COPPER, PVC AND/OR CAST IRON PIPING IS ALLOWED. UTILIZE CHROME NIPPLES AS REQUIRED FOR DOMESTIC ROUGH-IN.

C. PLUMBING FIXTURES SHALL BE POSITIVELY VENTED AND TRAPPED IN ACCORDANCE WITH THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE. WET VENTING IS ALLOWED IF WASTE PIPING IS OVERSIZED AND IN ACCORDANCE WITH CODE PROVISIONS. LOCATION OF VENT SHALL NOT EXCEED MAXIMUM DISTANCES TO THE TRAP AS ESTABLISHED WITHIN THE CODE.

12. CLEANING AND TESTING

A. ALL WATER PIPING, VALVES, ETC. SHALL BE THOROUGHLY FLUSHED OF FOREIGN MATTER AND TESTED FOR LEAKS IN ACCORDANCE WITH THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE, 2021 EDITION. ANY LEAKAGE SHALL BE REPAIRED. DISINFECT DOMESTIC WATER PIPING INCLUDING WATER SERVICE PIPING IN ACCORDANCE WITH ANWWA C601.

B. ALL DRAIN, WASTE AND VENT PIPING SHALL BE TESTED FOR LEAKS IN ACCORDANCE WITH THE VIRGINIA UNIFORM STATEWIDE BUILDING CODE, 2021 EDITION. NO VISIBLE DROP IN WATER LEVEL WILL BE ACCEPTABLE.
- PLUMBING LABORATORY GAS AND VACUUM SPECIFICATIONS
- SECTION 22 62 19 - LABORATORY GAS AND VACUUM SYSTEMS
PART 1 - GENERAL
- 1.1 SECTION INCLUDES
- A. MEDICAL GAS SYSTEMS.

B. MEDICAL VACUUM SYSTEM.
- 1.2 REFERENCES
- A. ANSI B16.18 - CAST COPPER ALLOY SOLDER-JOINT PRESSURE FITTINGS.

B. ANSI B16.22 - WROUGHT COPPER AND COPPER ALLOY SOLDER JOINT PRESSURE FITTINGS.

C. ANSI B40.1 - GAUGES, PRESSURE AND VACUUM, INDICATING DIAL TYPE-ELASTIC ELEMENT.

D. ASME BOILER AND PRESSURE VESSEL CODE.

E. ASTM A167 - STAINLESS AND HEAT-RESISTING CHROMIUM - NICKEL STEEL PLATE.

F. ASTM A269 - STAINLESS AND WELDED AUSTENITIC STAINLESS STEEL TUBING FOR GENERAL SERVICE.

G. ASTM A403 - WROUGHT AUSTENITIC STAINLESS STEEL PIPING FITTINGS.

H. ASTM B32 - SOLDER METAL.

I. ASTM B88 - SEAMLESS COPPER WATER TUBE.

J. ASTM B280 - SEAMLESS COPPER TUBE FOR AIR CONDITIONING AND REFRIGERATION FIELD SERVICE.

K. ASTM D1785 - POLY (VINYL CHLORIDE) (PVC) PLASTIC PIPE, SCHEDULES 40, 80, AND 120.

L. ASTM D2466 - POLY (VINYL CHLORIDE) (PVC) PLASTIC PIPE AND FITTINGS.

M. ASTM D2564 - SOLVENT CEMENTS FOR POLY (VINYL CHLORIDE) (PVC) PLASTIC PIPE AND FITTINGS.

N. AWS A5.8 - BRAZING FILLER METAL.

O. CGA S-7 - COMPRESSED AIR FOR HUMAN RESPIRATION.

P. CGA P-2.1 - MEDICAL-SURGICAL VACUUM SYSTEMS IN HEALTH CARE FACILITIES.

Q. CGA V-5 - DIAMETER INDEX SAFETY SYSTEM NON INTERCHANGEABLE LOW PRESSURE CONNECTIONS FOR MEDICAL GAS APPLICATIONS.

R. FM - FACTORY MUTUAL SYSTEM - APPROVAL GUIDE.

S. FS TT-P-845 - PRIMER, PAINT, ZINC CHROMATE, ALKYD TYPE.

T. FS W-C-586 - ELECTRICAL POWER CONNECTOR, PLUG, RECEPTACLE, AND CABLE OUTLET.

U. FS WW-V-35 - VALVE BALL.

V. FS WW-V-54 - VALVE, GATE, BRONZE (125, 150 AND 200 POUND, SCREWED, FLANGED, SOLDER END, FOR LAND USE).

W. MIL-R-36557 - REGULATOR, PRESSURE, MEDICAL GAS ADMINISTRATION APPARATUS.

X. MIL-V-82028 - VALVES, DIAPHRAGM, STOP.

Y. MSS SP-58 - PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN AND MANUFACTURE.

Z. MSS SP-69 - PIPE HANGERS AND SUPPORTS - SELECTION AND APPLICATION.

AA. NEMA 250 - ENCLOSURES FOR ELECTRICAL EQUIPMENT (1000 VOLTS MAXIMUM).

BB. NFPA 50 - BULK OXYGEN SYSTEMS AT CONSUMER SITES

CC. NFPA 99 - STANDARD FOR HEALTH CARE FACILITIES.
- 1.3 SUBMITTALS
- A. PRODUCT DATA: PROVIDE MANUFACTURERS LITERATURE AND ILLUSTRATIONS FOR ALL COMPONENTS INDICATING SIZE, DIMENSIONS AND CONFIGURATION.

B. INDEPENDENT TESTING AGENCY REPORTS: INDICATE SYSTEMS ARE COMPLETE, DOCUMENT TESTS.

C. MANUFACTURER'S INSTALLATION INSTRUCTION: INDICATE REQUIREMENTS FOR EQUIPMENT AND SYSTEMS.
- 1.4 PROJECT RECORD DOCUMENTS
- A. SUBMIT 3 COPIES OF AS-BUILT DRAWINGS, AND PROVIDE ELECTRONIC FILE IN AUTOCAD FORMAT.

B. RECORD ACTUAL LOCATIONS OF PIPING, VALVING, AND OUTLETS.
- 1.5 OPERATION AND MAINTENANCE DATA
- A. SUBMIT 5 COPIES OF OPERATION AND MAINTENANCE MANUALS.

B. OPERATION DATA: INCLUDE INSTALLATION INSTRUCTIONS, ASSEMBLY VIEWS, LUBRICATION INSTRUCTIONS, AND ASSEMBLY VIEWS.

C. MAINTENANCE DATA: INCLUDE MAINTENANCE AND INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY, AND SERVICE DEPOT LOCATION AND TELEPHONE.
- 1.6 QUALITY ASSURANCE
- A. PERFORM WORK IN ACCORDANCE WITH NFPA 99.

B. MAINTAIN ONE COPY OF EACH DOCUMENT ON SITE.
- 1.7 QUALIFICATIONS
- A. MANUFACTURER: COMPANY SPECIALIZING IN MANUFACTURING THE PRODUCTS SPECIFIED IN THIS SECTION WITH MINIMUM THREE YEARS DOCUMENTED EXPERIENCE.

B. INSTALLER: COMPANY SPECIALIZING IN PERFORMING THE WORK OF THIS SECTION WITH MINIMUM THREE YEARS DOCUMENTED EXPERIENCE.

C. TESTING LABORATORY: COMPANY SPECIALIZING IN PERFORMING THE TESTING OF THIS SECTION WITH MINIMUM THREE YEARS DOCUMENTED EXPERIENCE.
- 1.8 REGULATORY REQUIREMENTS
- A. CONFORM WITH APPLICABLE CODES FOR MEDICAL GAS SYSTEMS.

B. PROVIDE CERTIFICATE OF COMPLIANCE INDICATING APPROVAL OF SYSTEMS.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. ACCEPT MATERIAL ON SITE IN FACTORY CONTAINERS AND PACKING. INSPECT FOR DAMAGE.

B. PROTECT FROM DAMAGE AND CONTAMINATION BY MAINTAINING FACTORY PACKAGING AND CAPS IN PLACE UNTIL INSTALLATION.
- 1.10 SCHEDULING
- A. SCHEDULE WORK TO ENSURE EQUIPMENT IS INSTALLED AND SYSTEMS TESTED AND CERTIFIED PRIOR TO SUBSTANTIAL COMPLETION.
- 1.11 SCOPE
- A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, TOOLS AND SERVICES AND PERFORM ALL OPERATIONS REQUIRED IN CONNECTION WITH OR PROPERLY INCIDENTAL TO THE INSTALLATION AND TESTING OF LABORATORY GAS SYSTEMS, COMPRESSED AIR AND VACUUM PIPING SYSTEMS INCLUDING FITTINGS, VALVES, AIR COMPRESSORS, NITROGEN AND VACUUM PUMPS, FOR COMPLETE OPERABLE SYSTEMS.

2.1 PIPING

A. ALL PIPING FOR VACUUM AND GASES OF EVERY CHARACTER SHALL BE ASTM SPECIFICATION B-88, TYPE L, HARD DRAWN, SEAMLESS COPPER TUBING WITH WROUGHT COPPER SOLDER FITTINGS. NO FERRUS PIPING WILL BE PERMITTED IN THE SYSTEM. WHERE THREADED NIPPLES ARE REQUIRED THESE SHALL BE 1/2" S. BRASS. ALL VACUUM PIPING SHALL BE PURGED WITH DRY NITROGEN WHILE BEING SOLDERED.

B. ALL PIPING SHALL BE PITCHED BACK SO AS TO DRAIN TO THE POINT SHOWN ON THE DRAWINGS. ALL BRANCH TAKEOFFS SHALL BE MADE FROM THE TOP OF THE MAINS.

C. NOT USED.

D. FITTINGS FOR COPPER TUBE SHALL BE WROUGHT COPPER FITTINGS AND ATTACHED WITH SILVER SOLDER ALLOY CONTAINING NOT LESS THAN 50% SILVER. ALL SOLDERING SHALL BE DONE WITH DRY NITROGEN FLOWING THROUGH THE PIPE TO PREVENT OXIDATION AND SCALE INFORMATION.
- E. BEFORE ERECTION, ALL PIPE, TUBING, VALVES AND FITTINGS (EXCEPT THOSE SUPPLIED EXPRESSLY CLEANED FOR OBY MANUFACTURER) SHALL BE THOROUGHLY CLEANSED OF ALL GREASE, OIL AND OTHER COMBUSTIBLE MATERIALS BY WASHING IN A HOT SOLUTION OF SODIUM CARBONATE OR TRISODIUM PHOSPHATE MIXED IN EQUAL PROPORTIONS OF ONE POUND TO THREE GALLONS OF WATER. SCRUBBING AND CONTINUOUS AGITATION OF THE PARTS SHALL BE EMPLOYED WHERE NECESSARY TO REMOVE ALL DEPOSITS AND TO INSURE COMPLETE CLEANING. AFTER WASHING, ALL MATERIALS SHALL BE RINSED THOROUGHLY IN CLEAN, HOT WATER. AFTER RINSING, GREAT CARE MUST BE EXERCISED IN THE STORAGE AND HANDLING OF ALL MATERIALS AND IN THE CONDITION OF TOOLS USED IN CUTTING AND REAMING TO PREVENT OIL OR GREASE BEING INTRODUCED INTO THE TUBING, WHERE SUCH CONTAMINATION IS KNOWN TO HAVE OCCURRED, THE MATERIALS AFFECTED MUST BE REWASHED AND THEN RINSED.

F. WHERE SCREWED CONNECTIONS ARE REQUIRED AT EQUIPMENT, SUITABLE ADAPTERS SHALL BE PROVIDED WITH THREADED CONNECTIONS. A THIN PASTE OF LITHARGE AND GLYCERIN SHALL BE APPLIED TO THE EXTERNAL THREADS ONLY.

G. AFTER ERECTION OF PIPE AND TUBING, BUT PRIOR TO INSTALLATION OF THE SERVICE OUTLET VALVES, EACH SYSTEM SHALL BE BLOWN CLEAR OF MOISTURE AND FOREIGN MATTER BY MEANS OF DRY NITROGEN OR OIL FREE AIR.

H. AFTER INSTALLING SERVICE OUTLET VALVES, EACH SYSTEM SHALL BE SUBJECT TO A TEST PRESSURE OF 150 PSIG BY MEANS OF WATER-PUMPED (OIL FREE) NITROGEN OR AIR. THIS TEST PRESSURE SHALL BE MAINTAINED UNTIL EACH JOINT HAS BEEN THOROUGHLY EXAMINED FOR LEAKS BY MEANS OF SOAPY WATER. A SOAP SOLUTION MIXED IN THE FOLLOWING PROPORTIONS SHOULD BE USED: ONE OUNCE OF CASTLE OR PALM OIL SOAP, EIGHT OUNCES OF WATER, AND FOUR OUNCES OF GLYCERINE. DISSOLVE THE SOAP IN THE WATER, ADD THE GLYCERIN AND MIX THOROUGHLY. WIPE JOINTS CLEAN AFTER TEST. ALL LEAKS SHALL BE PROPERLY REPAIRED AND THE SYSTEM RETESTED.

I. A FINAL TEST SHALL BE 24 HOURS STANDING PRESSURE TEST WITH WATER PUMPED (OIL FREE) AIR OR DRY NITROGEN AT 150 PSIG TO CHECK THE COMPLETENESS OF PRIOR JOINT PRESSURE TESTS. IF WATER PUMPED NITROGEN IS USED, PARTICULAR CARE MUST BE EXERCISED TO ASSURE THAT IT IS ALL FLUSHED OUT WITH OXYGEN BEFORE PLACING THE SYSTEM IN SERVICE.
- 2.2 AIR AND VACUUM VALVES

A. STOP VALVES AT COMPRESSORS, TANKS, VACUUM PUMPS, AND IN VACUUM PIPING SHALL BE JENKINS 32A BRONZE BALL VALVES WITH SCREWED CONNECTIONS AND TEFLON SEATS.
- 2.3 FINAL CHECKING AND OPERATING INSTRUCTIONS

A. A REPRESENTATIVE OF THE EQUIPMENT MANUFACTURER SHALL PERIODICALLY CHECK WITH THE CONTRACTOR DURING INITIAL INSTALLATION OF THE PIPELINE SYSTEMS EQUIPMENT. HE SHALL ASSIST THE CONTRACTOR IN FINAL CHECK TO MAKE CERTAIN THAT ALL SYSTEMS ARE IN PERFECT OPERATING CONDITION. THE EQUIPMENT MANUFACTURER'S REPRESENTATIVE SHALL PROVIDE 8 HOURS OF INSTRUCTION TO THE HOSPITAL PERSONNEL IN THE USE OF THE PIPING SYSTEMS AND THE RELATED EQUIPMENT WHICH IS OPERATED FROM THOSE SYSTEMS.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. INSTALL IN COMPLETE COMPLIANCE WITH GOVERNING CODES AND MANUFACTURERS INSTRUCTIONS.

3.2 MANUFACTURER:

- A. EXCEPT FOR PIPING AND PIPE FITTINGS, ALL COMPONENTS SHALL BE SUPPLIED BY A SINGLE MANUFACTURER AND SHALL BE FULLY COMPATIBLE WITH OWNER'S EXISTING SYSTEM AND SERVICE DEVICES. LABORATORY GAS AND VACUUM SYSTEMS 22 62 19 - 3 SMITHGROUP | 12698.000 UT SOUTHWESTERN MEDICAL CENTER / UNIVERSITY OF TEXAS AT DALLAS BIOMEDICAL ENGINEERING & SCIENCE BUILDING AUGUST 23, 2021; CONSTRUCTION DOCUMENTS PACKAGE 3

3.3 TESTING:

- A. TEST IN ACCORDANCE WITH NFPA 99, SECTIONS 4-3 THROUGH 4-10. PROVIDE TO OWNER A NOTARIZED LETTER OF CERTIFICATION FROM EQUIPMENT MANUFACTURER CERTIFYING THE FOLLOWING:
- B. NO CROSS CONNECTIONS EXIST.
- C. ALARM SYSTEM IS ADJUSTED AND PERFORMING TO MANUFACTURER'S DESIGN.
- D. ALL COMPONENTS HAVE BEEN INSTALLED, ADJUSTED AND ARE FUNCTIONING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

3.4 COMPATIBILITY:

- A. VERIFY COMPATIBILITY OF ALL NEW COMPONENTS WITH EXISTING SYSTEM AND SERVICES.

END OF SECTION



SHEET NAME:

PLUMBING -
SPECIFICATIONS

SHEET NUMBER:

P001

SYMBOLS LEDEND

- #

CONSTRUCTION NOTE IDENTIFICATION
- △

REVISION IDENTIFICATION
- ⊕

CONNECT NEW TO EXISTING
- PIPE TURNING DOWN
- ↗

PIPE TURNING UP
- ⊕

BRANCH BOTTOM CONNECTION
- ⊕

BRANCH SIDE CONNECTION
- ⊕

BRANCH TOP CONNECTION
- ⊕

BALL VALVE
- DIRECTION OF FLOW

PLUMBING ABBREVIATIONS

ABBR	ABBREVIATION
ABV	ABOVE
AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
BEL	BELOW
BET	BETWEEN
BFF	BELOW FINISHED FLOOR
CLG	CEILING
CO2	CARBON DIOXIDE
CONC	CONCRETE
CONN	CONNECT, CONNECTION
CONT	CONTINUED
CORD	COORDINATE
DCW	DOMESTIC COLD WATER
DHW	DOMESTIC HOT WATER
DIA, Ø	DIAMETER
DN	DOWN
EA	EACH
ELEV	ELEVATION
EQ-1	EQUIPMENT TYPE/MARK
EXIST (E)	EXISTING
FLR	FLOOR
FR	FROM
HE	HELIUM
LGP	LABORATORY GAS PIPE
MAX	MAXIMUM
ME	METHANE
MTD	MOUNTED
NI	NITROGEN
O2	OXYGEN

GENERAL PLUMBING NOTES

- 1
- PLUMBING WORK INCLUDES DOMESTIC HOT AND COLD-WATER SYSTEMS INSIDE BUILDING; AND SOIL, WASTE, AND VENT SYSTEMS INSIDE BUILDING.
- 2
- FOR RENOVATION PROJECTS, CONTRACTOR SHALL VISIT JOB SITE PRIOR TO SUBMITTING A BID TO REVIEW THE CONDITIONS AT THE SITE.
- 3
- COMPLY WITH 2021 VIRGINIA UNIFORM STATEWIDE BUILDING CODE (VUSBC) AND VT 2022 DCSM.
- 4
- CONTRACTOR SHALL PROVIDE ANY ADDITIONAL FITTINGS REQUIRED FOR PROPER INSTALLATION AND MAINTAIN PROPER CLEARANCES.
- 5
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF ALL WORK AND MATERIAL UNDER THIS CONTRACT, AND SHALL BE RESPONSIBLE FOR ANY DAMAGE INCURRED.
- 6
- COORDINATE WORK WITH OWNER, INCLUDING TIME AND LOCATION OF WORK, AS WELL AS INTERRUPTIONS IN UTILITY SERVICES. CONTRACTOR SHALL COORDINATE WITH OWNER USE OF EXISTING UTILITIES, ETC.
- 7
- INSTALL ALL FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE FOR MANUFACTURER'S RECOMMENDED ACCESS AND SERVICE CLEARANCES.
- 8
- PROVIDE ALL MISCELLANEOUS WORK, EQUIPMENT AND MATERIALS TO COMPLETE THE WORK.
- 9
- ESCUTCHEONS: PROVIDE NICKEL OR CHROMIUM PLATED FLOOR, WALL, AND CEILING PLATES (SOLID RING) AROUND ALL EXPOSED BARE AND INSULATED PIPES WHERE THEY PASS THROUGH OR INTO FLOORS, WALLS, CASEWORK, AND CEILINGS OF FINISHED AND OCCUPIED SPACES. IN THE CASE OF INSULATED PIPES, THE PLATES SHALL FIT THE INSULATION SNUGLY.
- 10
- CONCEAL PIPING ABOVE CEILINGS, WITHIN WALLS OR CHASES WITHIN CASEWORK OR AS SPECIFICALLY NOTED.
- 11
- PROVIDE ACCESS PANELS TO ALL VALVES LOCATED WITHIN CHASES OR NON-ACCESSIBLE CEILINGS AND WALLS.
- 12
- REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF FIXTURE SPECIFICATION LOCATIONS AND MOUNTING HEIGHTS.
- 13
- ALL DOMESTIC WATER PIPING SHALL BE INSULATED UNLESS OTHERWISE INDICATED.
- 14
- CHECK ALL PIPING FOR PROPER PITCH PRIOR TO SUBSTANTIAL COMPLETION.
- 15
- PIPING SHALL BE HUNG TO TRUE ALIGNMENT, USING APPROPRIATE AND SUBSTANTIAL HANGER ARRANGEMENTS, HANGERS SHALL BE LOCATED SO THAT PIPING AND HANGERS WILL BE CLEAR OF OTHER PIPING, HANGERS, CONDUITS, LIGHTING FIXTURES, EQUIPMENT, CEILING SUSPENSION SYSTEMS, DUCTWORK, ETC. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR LINE WITH PIPE CLAMPS.
- 16
- PIPE HANGERS AS REQUIRED SHALL BE OF THE SAME METAL AS PIPE BEING SUPPORTED. SUPPORT METAL PIPE AT 10'-0" MAXIMUM.
- 17
- WHERE ADA COMPLIANT FIXTURES ARE INDICATED, SPECIFICALLY COORDINATE LOCATION AND MOUNTING HEIGHT OF FIXTURES TO COMPLY WITH ADA AND REQUIREMENTS OF THE ARCHITECTURAL DOCUMENTS.
- 18
- PROVIDE DIELECTRIC UNIONS WHERE CONNECTIONS ARE MADE BETWEEN DISSIMILAR METALS.

PLUMBING FIXTURE SCHEDULE

EM-1 - EMERGENCY SHOWER/EYE WASH

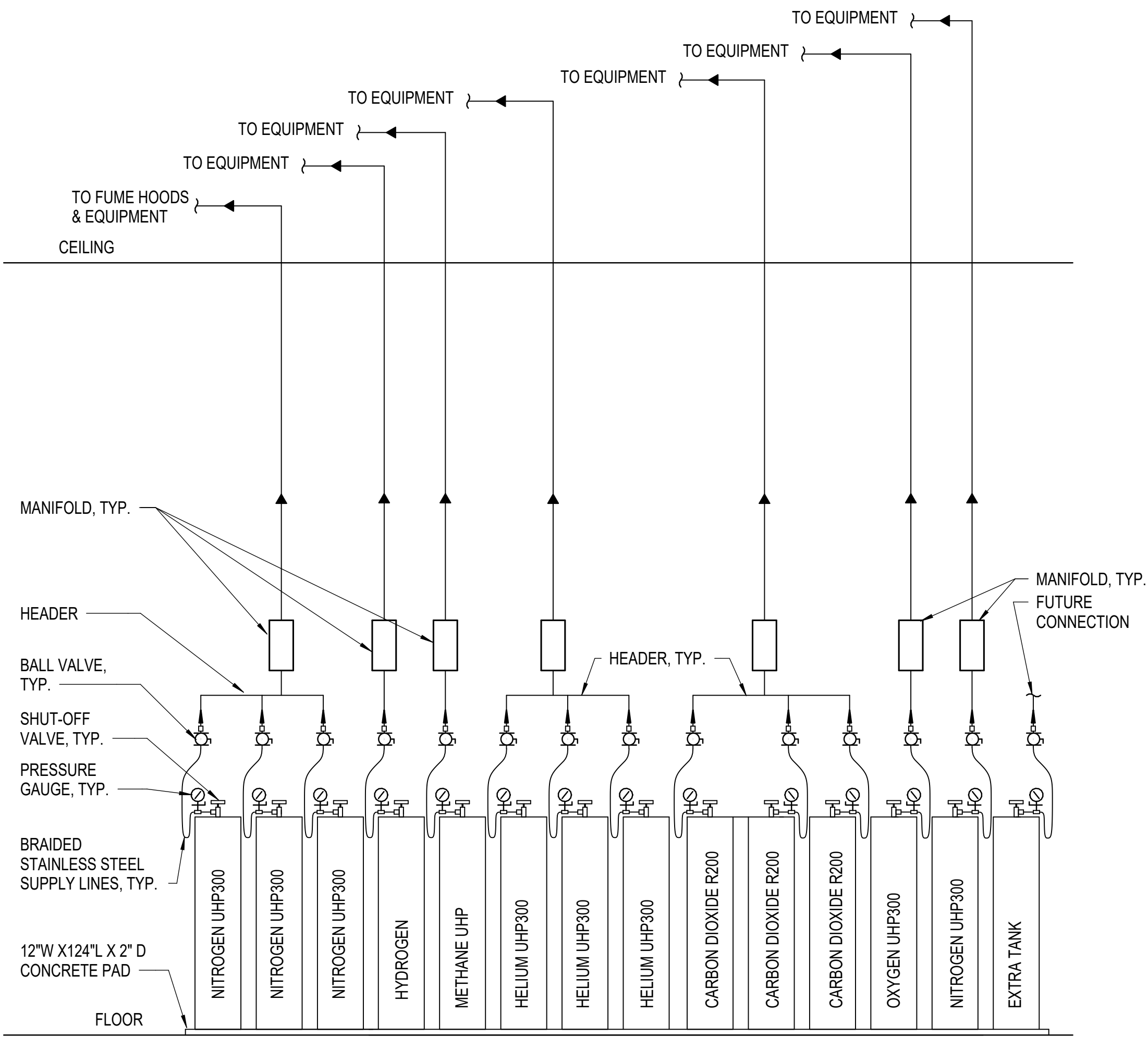
COLD WATER INLET: 1-1/4" HOT WATER INLET: 1-1/4" 85°F

COMBINATION DRENCH SHOWER / EYEWASH -1-1/4" 85°F HW SUPPLY AND DRAIN OUTLET, STAINLESS STEEL SHOWER HEAD AND EYEWASH BOWL WITH COVER, SHOWER HEAD WITH ACCESSIBLE PULL ROD, BRASS BALL VALVE, EYEWASH SPRAYHEADS WITH DUST COVER, PUSH/PADDLE EYEWASH ACTIVATION, IDENTIFICATION SIGN, 24" BOWL HEIGHT.

MIXING VALVE: INCLUDE EMERGENCY THERMOSTATIC MIXING VALVE. SATISFIES ANSI Z358.1 TEPID WATER REQUIREMENTS.

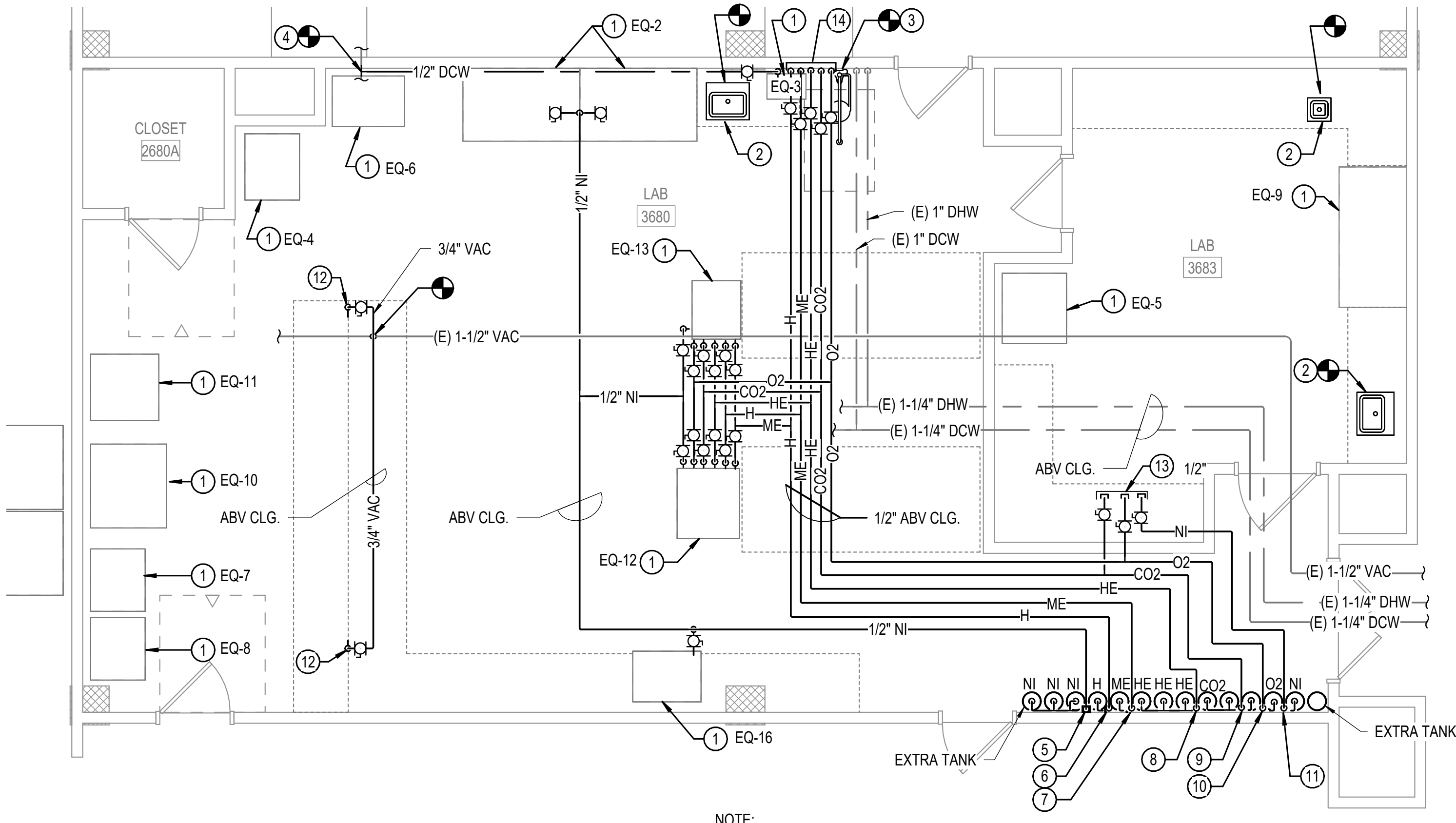
SHEET NOTES

- 1
- SEE ARCHITECTURAL SHEET A102 FOR EQUIPMENT LOCATION AND EQUIPMENT SCHEDULE.
- 2
- CONNECT NEW DCW/DHW TO NEW FIXTURE, PROVIDE SHUT-OFF VALVES AS REQUIRED, RECONNECT SANITARY WITH TRAP TO EXISTING SANITARY. SINK IS OWNER PROVIDED, CONTRACTOR INSTALLED. SEE DRAWINGS ON SHEET A103 FOR ADDITIONAL INFORMATION.
- 3
- RECONNETT EXISTING DCW/DHW W / SHUT-OFF VALVES TO NEW EMERGENCY SHOWER/FAEWASH FIXTURE.
- 4
- ROUTE NEW 1/2" DCW PIPING FROM THE EXISTING DCW PIPING ABOVE (EQ-6) TO RELOCATED WATER PURIFIER (EQ-3).
- 5
- NITROGEN MANIFOLD FOR NITROGEN TO GENERATOR, FUME HOOD AND EQUIPMENTS.
- 6
- HYDROGEN MANIFOLD.
- 7
- METHANE MANIFOLD.
- 8
- HELIUM MANIFOLD.
- 9
- CARBON DIOXIDE MANIFOLD.
- 10
- OXYGEN MANIFOLD.
- 11
- NITROGEN MANIFOLD.
- 12
- ROUTE NEW VAC PIPING FROM EXISTING VAC TO NEW CASEWORK, SEE ARCHITECTURAL FOR EQUIPMENT SCHEDULE.
- 13
- CAP, FOR FUTURE CONNECTION.
- 14
- NEW PIPING (HYDROGEN, HELIUM, METHANE, CARBON DIOXIDE AND OXYGEN FOR FUTURE USE, SHALL END WITH A BALL VALVE AND CAP AND END ABOVE CEILING.



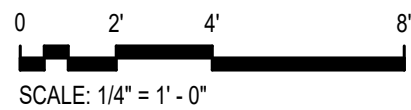
2 EQUIPMENT TANK STATION WITH MANIFOLD CONNECTION DETAIL

P101 N.T.S.



1 PLUMBING - FLOOR PLAN - PIPING

P101 SCALE: 1/4" = 1'-0"



BUILDING OFFICIAL APPROVAL STAMP

SPECTRUM DESIGN
architects | engineers

Plaza Suite 1
10 Church Avenue, SE
Roanoke, VA 24011
540.342.6001
SPECTRUMPC.COM



RENOVATIONS TO
LITTON-REAVES
LAB 3680 & 3683
VIRGINIA TECH

SPECTRUM DESIGN PROJECT NO.: 24128

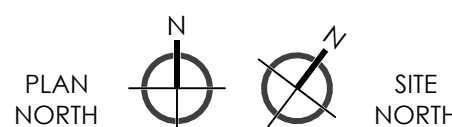


PROJ. MGR.: **JM** CHECKED BY: **GEG** DRAWN BY: **MKJ**

SHEET ISSUE DATE:
11.07.2025

PROJECT PHASE:
WORKING DRAWINGS

SHEET REVISIONS:



SHEET NAME:
**PLUMBING - NOTES,
LEGEND AND FLOOR
PLAN - PIPING**

SHEET NUMBER:

P101

ELECTRICAL SPECIFICATIONS

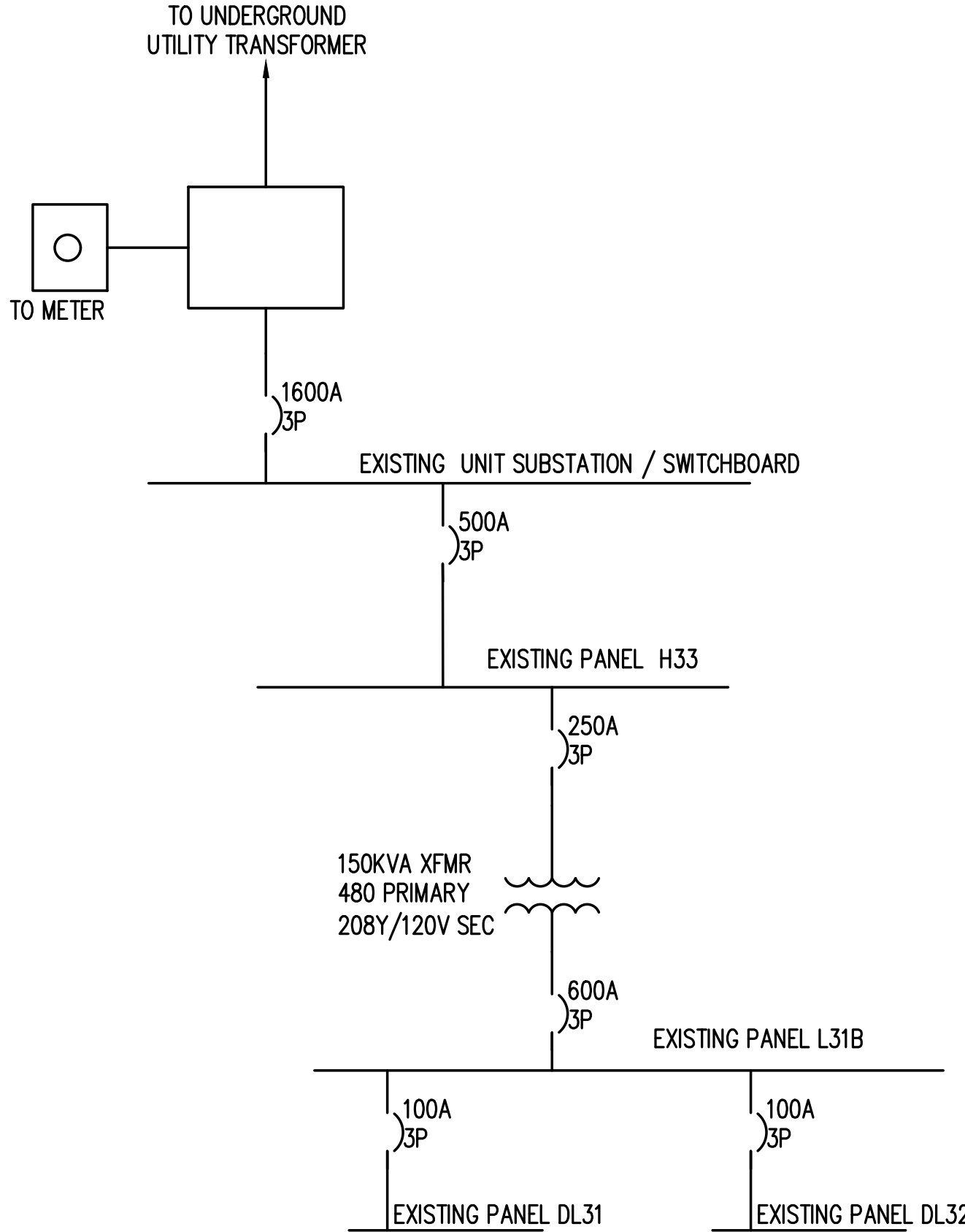
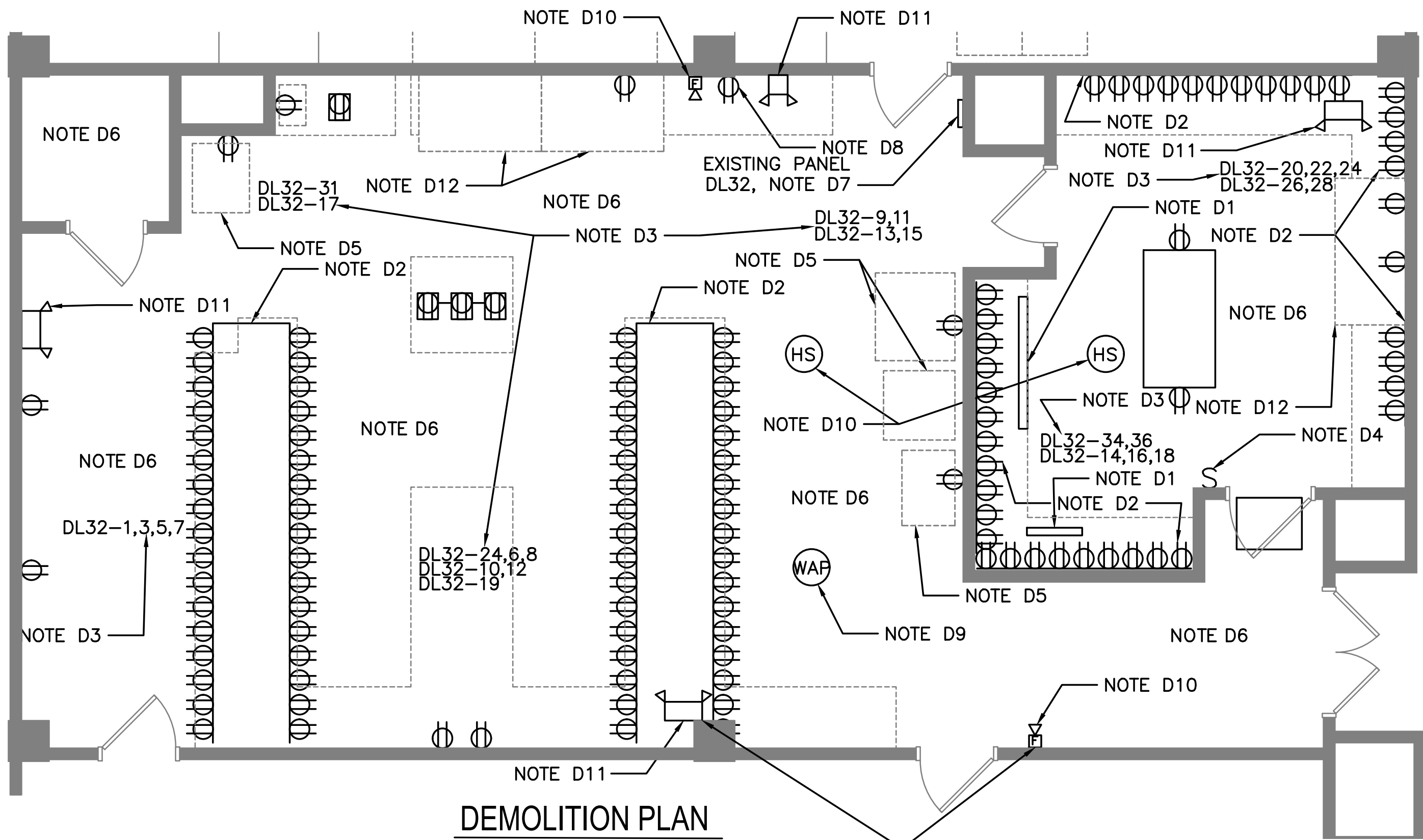
1. ALL WORK SHALL COMPLY WITH THE 2021 VIRGINIA UNIFORM STATEWIDE BUILDING CODE, AND THE 2020 EDITION OF THE NATIONAL ELECTRICAL CODE (NEC).
2. ALL ELECTRICAL COMPONENTS SHALL BE TESTED, LISTED AND LABELED BY UNDERWRITERS LABORATORIES (UL). ALL COMPONENTS, FIXTURES, DEVICES AND WIRING NOT SPECIFICALLY INDICATED TO BE "EXIST." OR "N.I.C." SHALL BE NEW MATERIALS, PROVIDED UNDER THIS CONTRACT.
3. ALL CONDUCTORS SHALL BE 600-VOLT SOLID COPPER WITH INSULATION RATED THHN OR THWN, APPLIED AT 75° RATING FOR CONDUCTORS #1 AND LARGER, AND AT 60° RATING FOR SMALLER CONDUCTOR SIZES. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG FOR BRANCH CIRCUITS. PROVIDE STRANDED CONDUCTORS FOR SIZES #8 AND LARGER.
4. ALL WIRING SHALL BE IN METAL CONDUIT ABOVE GRADE, MINIMUM SIZE SHALL BE 3/4". ALL CONDUIT BELOW GRADE SHALL BE PVC, MINIMUM SIZE 1". LOW VOLTAGE CONDUITS BELOW GRADE SHALL BE 12" DEEP AND CONDUITS WITH CONDUCTORS AT 120 VOLTS OR GREATER SHALL BE 24" DEEP. ALL CONDUIT ABOVE CEILINGS AND IN WALLS SHALL BE (EMT). ELECTRICAL METALLIC TUBING (EMT) SHALL BE ASSEMBLED WITH RAIN TIGHT TYPE FITTINGS. PROVIDE UL LIQUID-TIGHT FLEXIBLE METAL CONDUIT FOR CONNECTIONS TO FURNITURE AND EQUIPMENT SUBJECT TO MOVEMENT OR VIBRATION. ALL BOXES SHALL BE RIGID CONDUIT WITH WET LOCATION FITTINGS.
5. PROVIDE TYPE WRITTEN PANELBOARD SCHEDULES FOR PANELBOARDS.
6. MOUNT ALL EQUIPMENT PLUMB AND LEVEL WITH SUBSTANTIAL FASTENERS SUITABLE FOR THE LOAD. ALL COMPONENTS SHALL BE RIGIDLY ANCHORED FOR LONG LIFE UNDER HARD USE.
7. LOCATE ALL CONDUITS TO AVOID INTERFERENCE WITH DUCTS, PIPES, AND MECHANICAL EQUIPMENT, OR WITH ACCESS TO EQUIPMENT THAT REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE. COORDINATE EXACT EQUIPMENT LOCATIONS WITH PLUMBING AND MECHANICAL LOCATIONS TO INSURE REQUIRED. CLEARANCE AROUND EQUIPMENT. COORDINATE LOCATIONS WITH ARCHITECTS PRIOR TO INSTALLATION.
8. DO NOT SUPPORT CONDUITS FROM PIPES, DUCTS, OR A CEILING SUSPENSION SYSTEM. SECURE TO STRUCTURE.
9. UPON COMPLETION OF THE INSTALLATION, ADJUST, SET AND TEST ALL COMPONENTS, TO ENSURE CORRECT AND SATISFACTORY OPERATION.
10. PROVIDE ALL MISCELLANEOUS AND NECESSARY COMPONENTS AND MATERIALS REQUIRED FOR A COMPLETE AND PROPERLY FUNCTIONING ELECTRICAL INSTALLATION, COMPLYING WITH THE REFERENCED CODES, WHETHER OR NOT SUCH COMPONENTS ARE SPECIFICALLY REFERENCED IN THESE OUTLINE SPECIFICATIONS.
11. ALL FIRE ALARM DEVICES ARE TO EXISTING TO REMAIN IN SERVICE DURING THE EXECUTION OF THE WORK DUE TO THE BUILDING BEING OCCUPIED WHILE CONSTRUCTION IS UNDERWAY. PROVIDE A FIRE WATCH IF SYSTEM IS OUT OF SERVICE.
12. ALL FIRE ALARM WORK IS TO BE INSTALLED BY A NICET LEVEL IV CERTIFIED FIRE ALARM CONTRACTOR PER 2023 VT DCSM, SECTION 3.10.2
13. CORD REEL TO BE PLENUM RATED CORD REEL ENCLOSURE, WHITE HBLIPRBOX, HUBBELL WIRING DEVICES OR EQUAL. MOUNTED IN CEILING.

GENERAL NOTES

1. MECHANICAL EQUIPMENT IS SHOWN IN APPROXIMATE LOCATIONS. FOR EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND PIPING, SEE MECHANICAL DRAWINGS. SOME MECHANICAL EQUIPMENT IS LOCATED ON THE ROOF. VERIFY LOCATION WITH MECHANICAL AND PROVIDE ALL CONDUIT AND WIRING TO OUTDOOR EQUIPMENT.
2. REVISE PANELBOARD SCHEDULES ON PANEL DIRECTORIES TO REFLECT FINAL INSTALLATION CONDITIONS.
3. LOCATE ALL RACEWAYS TO AVOID INTERFERENCE WITH DUCTS, PIPES, MECHANICAL EQUIPMENT, WITH REMOVAL OF CEILING TILES, OR WITH ACCESS TO EQUIPMENT WHICH REQUIRES PERIODIC ADJUSTMENT OR MAINTENANCE.
4. PROVIDE NAMEPLATES ON THE EXTERIOR OF ALL ELECTRICAL PANELS AND ENCLOSURES WITH THE DEVICE ID, RATING, POWER SOURCE AND INSTALLATION DATE AND BY WHICH SWITCH OR STARTER.
5. UNLESS INDICATED OTHERWISE, SIZE CONDUITS IN ACCORDANCE WITH NFPA 70.
6. COORDINATE WITH THE MECHANICAL CONTRACTOR TO ENSURE ALL WORKING CLEARANCE AND DEDICATED WORKING SPACE OF PANELBOARDS.
7. GROUNDING CONDUCTORS ARE NOT INDICATED IN BRANCH CIRCUIT RACEWAYS. PROVIDE GROUND CONDUCTORS AS REQUIRED BY NEC.
8. PROVIDE LABELS ON ALL RECEPTACLE INDICATING PANEL AND CIRCUIT FEEDING EACH DEVICE.
9. NOTIFY NIS 1 WEEK PRIOR TO DEMOLITION TO SCHEDULE REMOVAL OF EXISTING DATA OUTLET FACEPLATES.
10. DATA WIRING TO BE IN SEPARATE DATA CONDUIT.

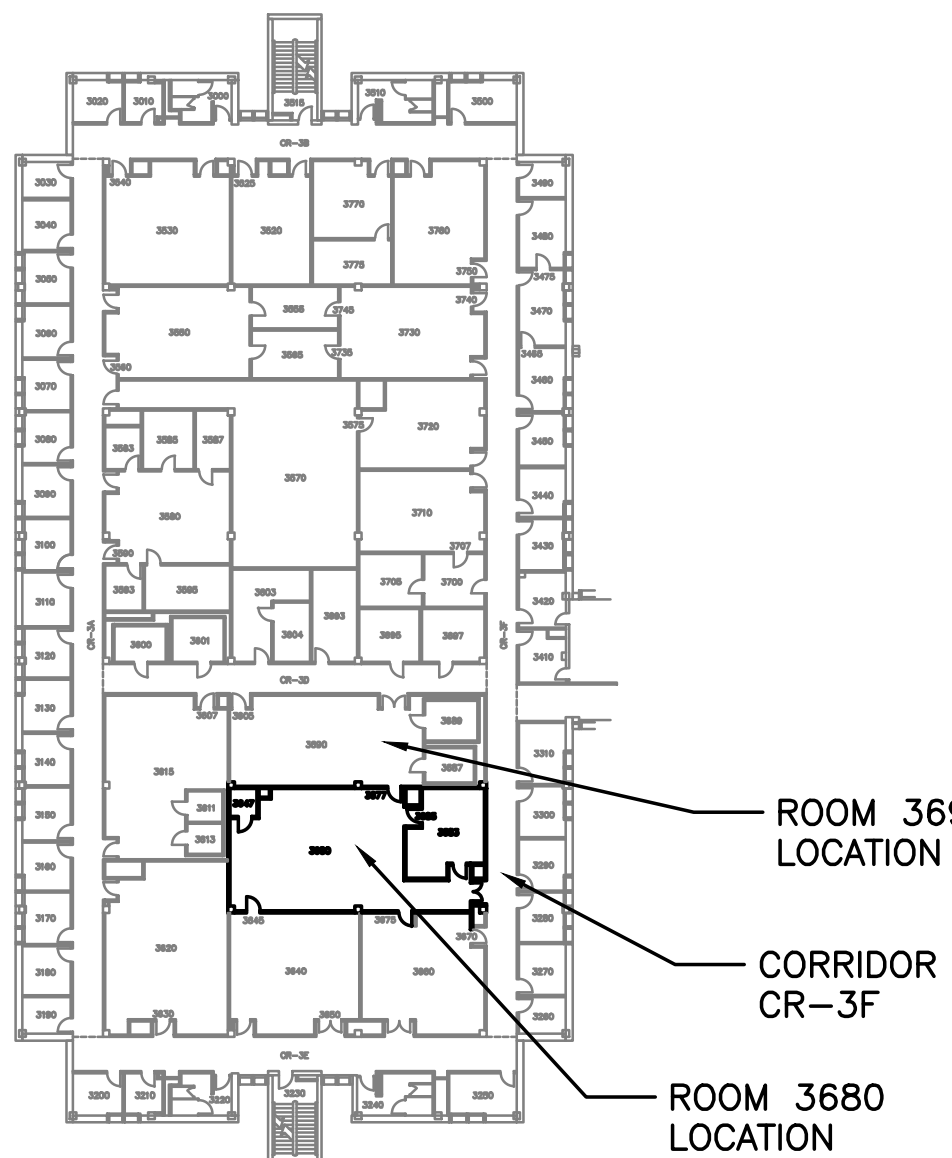
ELECTRICAL LEGEND

- S SINGLE-POLE SWITCH, MOUNTING HEIGHT = 4'-0" TO TOP. LOWER CASE SUBSCRIPT WHEN USED, INDICATES FIXTURES CONTROLLED (TYP).
- SD DIMMER SWITCH, MOUNTING HEIGHT = 4'-0" TO TOP, SUBSCRIPT INDICATES FIXTURES CONTROLLED WITH THIS SWITCH
- LED LIGHTING FIXTURE, RECESSED, SURFACE OR PENDANT CEILING MOUNTED, COORDINATE WITH OWNER FOR ANY DESIRED NIGHT LIGHT LOCATIONS.
- JUNCTION BOX
- CONDUCTORS IN CONDUIT CONCEALED IN CEILING OR WALL.
- BRANCH CIRCUIT HOME RUN TO PANELBOARD. NOTATION INDICATES PANELBOARD & BRANCH CIRCUIT CONNECTION.
- CONDUCTORS IN CONDUIT CONCEALED IN SLAB OR BELOW GRADE.
- CONDUCTORS IN CONDUIT TURNED UP.
- CONDUCTORS IN CONDUIT TURNED DOWN.
- PANELBOARD, 208Y/120-VOLT, 3-PHASE, 4-WIRE, MOUNTING HEIGHT=6'-0" TO TOP. SEE PANELBOARD SCHEDULES.
- DUPLEX WALL RECEPTACLE, MOUNTING HEIGHT = 1'-6", EXCEPT 'C' SUBSCRIPT INDICATES MOUNTING IN CASEWORK(TYP). 'GFI' SUBSCRIPT INDICATES GROUND FAULT, , 'S' INDICATES MOUNTED HEIGHT = 8" ABOVE COUNTER(TYP). 'S' INDICATES SPLIT WIRED RECEPTACLE 'ETR' INDICATES EXISTING TO REMAIN
- CORD REEL, SEE SPECIFICATIONS
- WIRELESS ACCESS POINT
- 120 VOLT RECEPTACLES., SINGLE OUTLET RECEPTACLE IN MULTI-OUTLET ASSEMBLY
- DATA OUTLET, CONDUIT WITH 1" CONDUIT TO ABOVE ACCESSIBLE CEILING IN MAIN CORRIDOR CR-3F. ON EXISTING WALLS USE EQUIVALENT SURFACE RACEWAY, SURFACE RACEWAY WITH 2 GANG OUTLET BOX WITH 2 GANG PLASTER RING
- FIRE ALARM VISUAL AND AUDIBLE COMBO, 15CD INDICATES CANDELA RATING
- SAFETY DISCONNECT, 240 VOLT, SINGLE OR THREE PHASE, COORDINATE WITH UNIT
- OCCUPANCY SENSOR, DUAL TECHNOLOGY
- EMERGENCY BATTERY UNIT, LITHONIA EU2C OR EQUAL
- FIRE ALARM HORN STROBES COMBO UNITS



EXISTING PARTIAL ONE LINE DIAGRAM

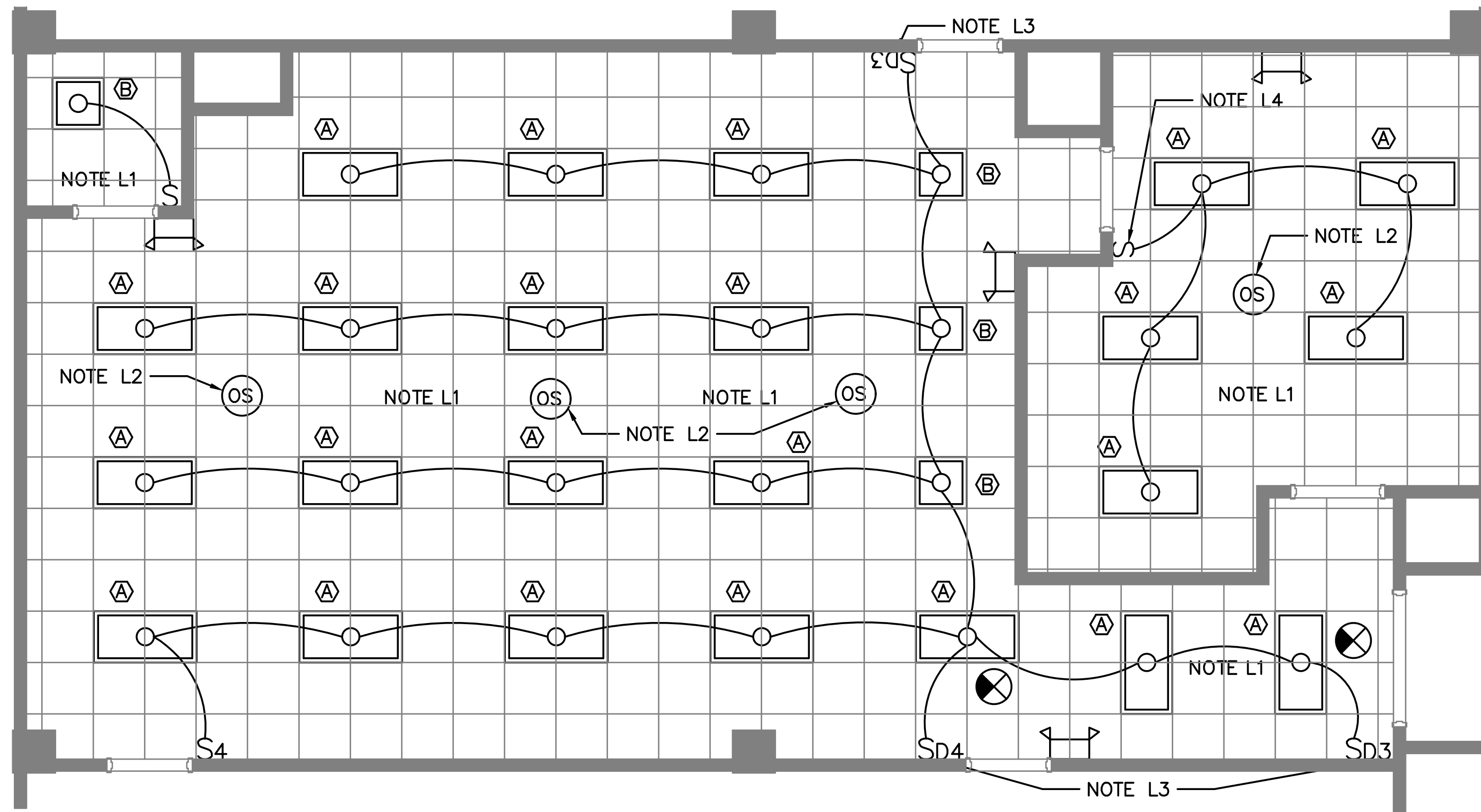
SCALE: NONE



KEY PLAN

NO SCALE:

EXISTING PANEL DL31																					
VOLTAGE: 208Y/120				PHASE: 3				BUS AMPS: 100A				☐ SURFACE MOUNTED ☐ FLUSH MOUNTED				KAIC RATING: 22,000					
				WIRE: 4				MAIN BREAKER AMPS: MLO													
CKT	BRKR	WIRE		CIRCUIT	LOAD - KVA				CKT	BRKR	WIRE		CIRCUIT	LOAD - KVA							
NO.	P	AMPS	NO	SZ	*	DESCRIPTION	PHA	PHB	PHC	3 PH	NO.	P	AMPS	NO	SZ	*	DESCRIPTION	PHA	PHB	PHC	3 PH
1	1	20				PLG MLD REC 3068					2	1	20				PLG MLD REC 3068				
3	1	20				PLG MLD REC 3068					4	1	20				PLG MLD REC 3068				
5	1	20				PLUG MLD REC 3068					6	1	20				PLG MLD REC 3068				
7	1	20				REC IN FREEZER					8	1	20				PLG MLD REC 3068				
9	1	20				REC IN FREEZER					10	1	20				REC FUMEHOOD				
11	1	20				REC IN COOLER					12	2	20				2P REC FUMEHOOD				
13	1	30				REC 30A 3068					14										
15	2	30				2P REC CENTRIFUGE					16	1	20				BLANK				
17											18	1	20				BLANK				
19	1	20				REC PUMP 3068					20	2	50				50AREC RM 3690				
21	2	20				2P REC 3068					22										
23											24	2	30				208V REC 3690				
25	1	20				REC FUTURE 3068					26										
27	1	20				REC DED. 3690					28	2	20				208V REC 3690				
29	1	20				REC DED. 3690					30										
TOTAL LEFT SIDE										TOTAL RIGHT SIDE											
TOTAL										TOTAL CONNECTED LOAD											
* NOTES																					



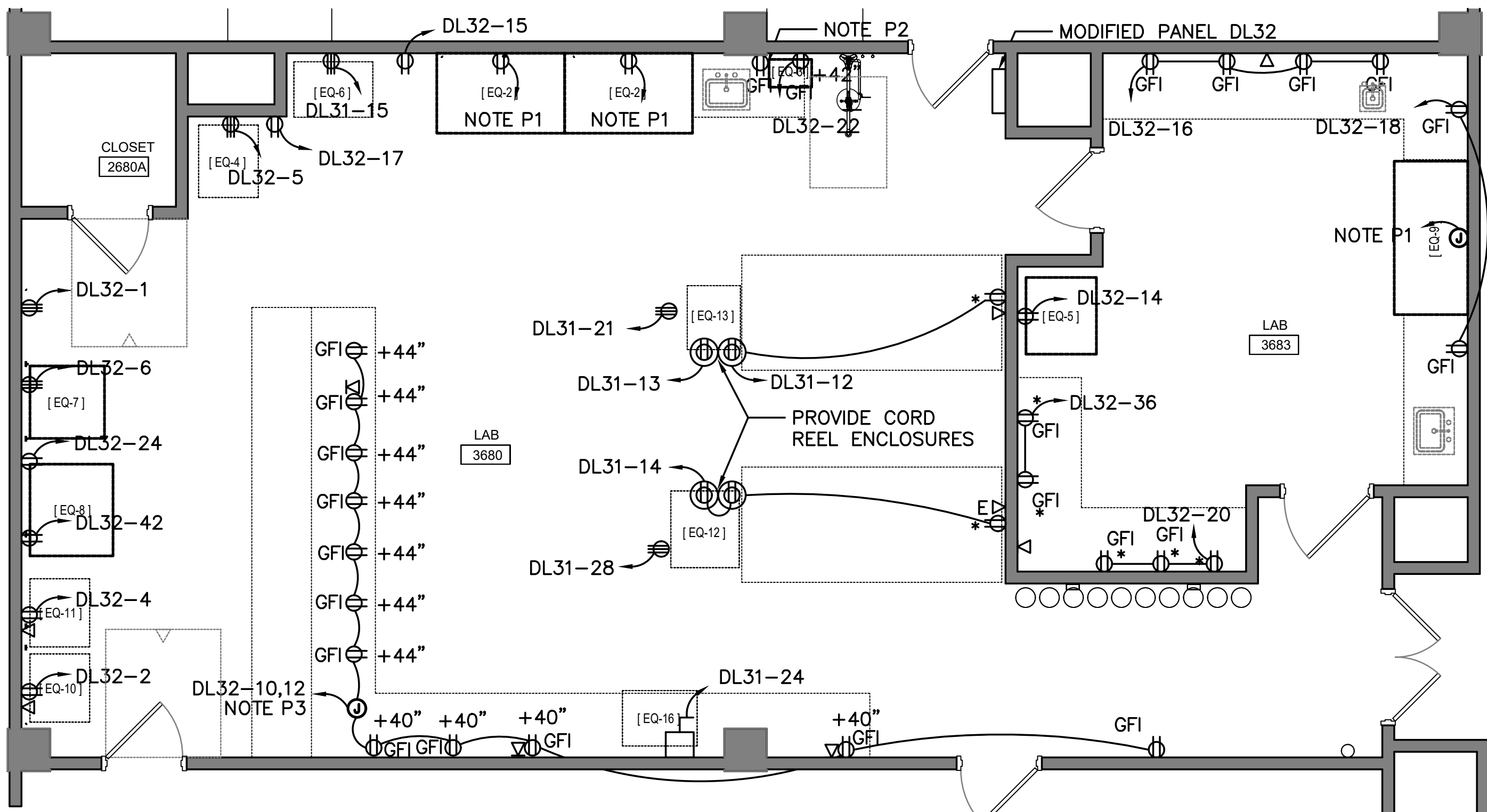
LIGHTING PLAN
1/4" = 1'-0"

CALCULATIONS:	
DEMOLISHED LIGHTING:	
27 FIXTURES AT 128W EACH = 3456 WATTS	
NEW LIGHTING:	
27 FIXTURES AT 36 WATTS EACH = 972 WATTS	
ENERGY CALCULATIONS:	
SQUARE FOOTAGE IS 1518 SQ FT.	
SCHOOL/UNIVERSITY / LAB/WORK SHOP REQUIREMENT OF .76 TO .91 WATTS/SQ FT ALLOWED	
DESIGNED SQUARE FOOT IS 0.64 WATTS PER SQ FT.	

- NOTES THIS SHEET:
- L1. PROVIDE NEW LIGHTING. RECONNECT TO EXISTING LIGHTING CIRCUIT. PROVIDE NEW OCCUPANCY SENSORS TO CONTROL LIGHTS. RETAIN EXISTING SWITCH LOCATIONS. PROVIDE NEW SWITCHES TO REPLACE EXISTING. NEW LIGHTING SYSTEM TO HAVE NEW DRY CONTACTS ON THE POWER PACKS FOR CONNECTION TO BAS SYSTEM.
- L2. PROVIDE A VACANCY SENSOR IN THIS ROOM TO REQUIRE MANUAL ON FOR LIGHTS TO TURN ON.
- L3. PROVIDE NEW DIMMABLE SWITCH TO CONTROL LARGE OPEN OFFICE AREA.
- L4. RELOCATE LIGHT SWITCH FOR THIS ROOM TO NEW DOOR LOCATION. PROVIDE A NEW SWITCH.

LIGHTING FIXTURE SCHEDULE						
MARK	MANUFACTURER	MODEL NUMBER	INPUT VOLTAGE	LAMPS TYPE	TOTAL WATTS	MNTG.
A	LITHONIA	SPX 2X4 48L MIN10 LP840 90CRI(EM=E10W)	277V	LED	35.79	REC
B	LITHONIA	SPX 2X2 48L MIN10 LP840 90CRI(EM=E10W)	277V	LED	34.9	REC
	LITHONIA	ELM2LF EMERGENCY EGRESS LIGHT FIXTURE		LED	2.4	SURF

- NOTES THIS SHEET:
- P1. RETAIN EXISTING POWER FOR FUME HOOD AND FUME HOOD RECEPTACLES.
- P2. PROVIDE GFCI RECEPTACLE FOR CURRENT RECEPTACLE.
- P3. PROVIDE WIREMOLD FOR POWER FOR RECEPTACLES AND DATA. CONNECT EVERY OTHER RECEPTACLE TO ALTERNATING CIRCUIT. DATA WIRING SHOULD BE IN SEPARATE CONDUIT.



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

CALCULATIONS:	
RECEPTACLE REALLOCATION:	
EXISTING LOAD ON PANEL WILL BE SPREAD BETWEEN THIS LAB AND ADJACENT LAB. PANEL HAS NO ADDITIONAL LOADS. EXISTING LOADS ARE RELOCATED TO ADJACENT ROOM.	

EQUIPMENT			
MARK	DESCRIPTION	REMARKS	QTY
EQ-1	FUME HOOD	RM	2
EQ-3	WATER FILTRATION	3690	1
EQ-4	CENTRIFUGE (BECKMAN COULTER AVANTI-J-25)		1
EQ-5	REFRIDGERATOR (SAMSUNG)		1
EQ-6	ULTRA CENTRIFUGE (BECKMAN LE-80)		1
EQ-7	REFRIDGERATOR (NOR-LAKE EXPLOSION PROOF)		1
EQ-8	-80 FREEZER (FISHER ISOTEMP)		1
EQ-10	FREEZE DRYER (LABCONCO FREEZONE 6)		1
EQ-11	FREEZE DRYER (LABCONCO FREEZONE 12)		1
EQ-12	IRMS (TRACE GC ULTRA/DELTA V ADVANTAGE ISOTOPE RATIO MS)		1
EQ-13	GC/QUAD (ISQ LT/TRACE 1310 GAS CHROMATOGRAPH)		1
EQ-14	-20 FREEZER (FUTURE)	APPROX. SIZE	1
EQ-15	-20 FREEZER (FUTURE)	APPROX. SIZE	1
EQ-16	N GENERATOR (FUTURE)	APPROX. SIZE	1

COORDINATE FINAL EQUIPMENT CONNECTIONS WITH OWNER TO VERIFY BREAKER AND WIRE SIZE.

MODIFIED PANEL DL32																					
VOLTAGE: 208Y120			PHASE: 3			BUS AMPS: 100A			X SURFACE MOUNTED												
			WIRE: 4			MAIN BREAKER AMPS: MLO			FLUSH MOUNTED												
									kAIC RATING: 22.0kA												
CT	BRKR	WIRE	CIRCUIT DESCRIPTION				LOAD-KVA				CT	BRKR	WIRE	CIRCUIT DESCRIPTION				LOAD-KVA			
NO.	P	AMPS	NO.	P	AMPS	NO.	P	AMPS	NO.	P	AMPS	NO.	P	AMPS	NO.	P	AMPS	NO.	P	AMPS	
1	2	20	3	10		EQ-11 RCPT 3680	1	0		1	2	20	2	12	FREER 3680	1	0		1	2	20
3												4	1	20	2	12	FREER 3680	1	5		
5	2	20	3	10		EQ-4 RCPT 3680	1	0		7	1	20	2	12	EQ-10 RCPT 3680	1	0		1	0	
7										8	2	20	3	10							
9	1	20				REC 3066				10	1	20	2	12	PLUGMOLD 3680	1	0		1	0	
11	1	20				REC 3067-3066				12	1	20	2	12	PLUGMOLD 3680	1	0		1	0	
13	1	20				FUMEGHOD 3066				14	1	20	2	12	EQ-3 RCPT 3683	1	0				
15	1	20	2	12		RCPT 3680	0.2			16	1	20	2	12	3683RCPTSCOPE	0.7	0.2				
17	1	20	2	12		RCPT 3680		0.2		18	1	20	2	12	3683 INCUBATOR	0.7					
19	2	30				2P REC REFR. CENTRIFUGE 3080				20	1	20	2	12	3683 H2O2BAT	0.2	1.0				
21										22	1	20	2	12	RCPT RCPT 3680	1	0		1	0	
23	2	20				2P REC 3066				24	1	20	2	12	EQ-1 RCPT 3680						
25										26	1	20			REC FUMEGHOD 3065						
27	1	20				REC ICE 4066 GFCI				28	1	20			REC FUMEGHOD 3066						
29	2	50				50A REC 3690				30	1	20			REC FUTURE 3065						
31										32	2	20			2P REC FUTURE 3065						
33	2	20				FREER				34											
35										36	1	20	2	12	RCPTS 3683,3680				0.7		
37	1	20				FREER DRY SYS. 3690				38	2	20			2P REC FUTURE 3065						
39	2	20				2P REC FUTURE 3065				40											
41										42	1	20	2	12	FREER 3680				1.5		
TOTAL LEFT SIDE						2.0	1.2	1.2	0.0	TOTAL RIGHT SIDE						3.7	4.2	5.4	0.0		
TOTAL RIGHT SIDE						3.7	4.2	5.4	0.0	TOTAL CONNECTED LOAD						17.7					
TOTAL						5.7	5.4	6.6	0.0												
* NOTES																					
1. VERIFY ALL OWNER PROVIDED EQUIPMENT PRIOR TO INSTALLATION.																					