



Hawaii Health Systems Corporation
Kauai Division
COVID-19 Testing Lab Renovations
Schematic Basis of Design

14 December 2020

Design Team

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Architecture/ Interior Design Basis of Design:

The new COVID-19 Testing Lab will be located at the existing Autopsy Room in the north west corner of the main hospital building. Since autopsies are no longer being performed at Kauai Veteran’s Memorial Hospital (KVMH), the room is currently being used as soiled storage holding. The room contains a stainless steel 2-compartment sink with a connected stainless-steel counter and a waste sink. The walls facing the exterior of the building are concrete and the walls facing the interior are assumed to be gypsum board and metal stud. There is a sloped concrete floor with two floor sinks. The ceiling is an acoustic ceiling tile with metal grid.

For the new COVID-19 Testing Lab, the 2-compartment sink, waste sink and floor drains will be removed. The sloping floor will also be demolished and leveled in preparation for new flooring. The existing door will be removed. The tile on the walls may remain and be covered with new furred walls. A majority of the ceiling grid will remain as is, with modifications as needed for the new lab design. The existing acoustic ceiling tiles will be removed.

The renovations to the former Autopsy room to the new COVID-19 Testing Lab will follow the following building codes:

2012 International Building Code with County of Kauai Amendments
2012 International Existing Building Code with County of Kauai Amendments
2010 Americans with Disabilities Act Accessibility Guidelines – Referencing IBC 2003

However, this project will be exempt from the County of Kauai’s permitting process, per the section attached in Appendix D.

The design for the COVID-19 lab will also include a new Ante Room. A new gypsum board partition will be added to divide the space. The Ante Room will be used to don and doff personal protection equipment before lab technicians enter the Covid-19 Lab to work. This room will include, a new hand sink, a full height wardrobe and upper and base cabinets for storage. Two new doors will be added to this space. A new door with a lite will replaces the existing door at its current location and at the new partition. The floors will be sheet vinyl with an integral base, wall paint and a scrubbable acoustic tile ceiling. There will also be a designated space for a biohazard waste bin.

The COVID-19 Lab will include a new fume hood, hand sink, undercounter freezer, undercounter refrigerator, COVID testing equipment and technician workstation. These items have been selected with coordination from HHSC Administration and HHSC Lab departments. The flooring will be leveled for a new sheet vinyl flooring with an integral base. New gypsum board furred walls will be added to the existing concrete walls to allow for the addition of new plumbing lines and electrical outlets. The walls will be painted, and the ceiling will be the existing grid with new scrubbable acoustic ceiling tiles. The new lab will include an epoxy resin countertop around the perimeter of the room with base and upper cabinets where space allows. Please see appendices for digital images of the proposed finishes. The arrangement of the equipment and workstation will depend on the clearances around the fume hood, as shown in NIH guidelines. Additional lab features can be found in the Biosafety Basis of Design section.

Space Program:

Room	No.	SF	Total	Notes
Ante Room	1	62.42	62.42	New hand sink with upper and base cabinets
Testing Lab Room	1	194.41	194.41	New hand sink with upper and base cabinets
Totals	2	256.83	256.83	

Structural Basis of Design

The proposed covid testing lab renovations is located within the previous autopsy room within the hospital. There are no walls being proposed to be removed. A new non-bearing gypsum board wall is proposed to separate the lab space from the ante room. This new wall should be framed with 362S162-33 (3-5/8" x 1-5/8" stiffened flange x 20 gauge) studs at 16" OC to resist a minimum 5 PSF lateral load for a clear wall height of as high as possibly 14'. Two new hand sinks are proposed which will require supply water and sewer lines to be installed. The existing 4" thick slab-on-grade will need to be sawcut, removed and replaced in order to install these utility pipes. An exhaust hood is also proposed within the lab room and may need a small roughly 12" diameter penetration to be cored out and removed within the existing reinforced concrete roof slab framing in order to allow for the exhaust to exit the room. The 5" thick roof slab reinforced with #5 bottom at 9-1/2" OC has been checked to support the new exhaust fan and roughly 7 ft high chimney stack and found to be adequate to support it. A new curb will need to be placed on the roof slab to carry the exhaust fan however. Depending on the size of this curb, the weight of the curb on the slab will need to be rechecked for adequacy.

Mechanical Basis of Design

DESIGN REFERENCES

1. International Building Code
2. Uniform Fire Code, 2007 Edition
3. ASHRAE/ASHE Standard 170-2008, Ventilation of Health Care Facilities
4. Uniform Plumbing Code, Edition 1997
5. ASHRAE 62-2007, Ventilation for Acceptable Air Quality
6. ASHRAE Fundamentals
7. ASHRAE Applications
8. Americans with Disabilities Accessibility Guidelines.
9. National Fire Protection Codes, including:
 NFPA 90A Installation of Air Conditioning and Ventilation System

Mechanical work will include providing cooling, exhaust, ventilation, pressurization control, and humidity control to convert the existing autopsy room to a new Covid Lab.

The existing ductwork serving the autopsy room will be removed and capped. The existing AHU-23 and EF-18 will be rebalanced for the updated design conditions.

Cooling for the lab and Ante room will be provided by a Constant Air Volume (CAV) chilled water Dedicated Outdoor Air System (DOAS) unit in the ceiling with ductwork distribution. The unit will be connected to the existing hospital hot water system for reheat. The unit will provide 100% outdoor air to the ante room and lab space. Lab space shall be cooled to 72 F and 50% humidity. Supply air diffusers shall be laminar type. The cooling coil will constantly cool the supply air to 55F. The unit will be provided with a thermostat which will control the reheat coil. The DOAS unit will have a MERV-8 prefilter and MERV 13 final filter as well as a UV light in the unit.

Exhaust for the lab space will be provided by a fume hood type exhaust fan located on the roof. The fan will be connected to the lab fume hood and provide at least 6 AC (Air Changes) for the room per ASHRAE 170. The Ante room will be exhausted by the existing EF-18 on the roof.

The Ante room will be negative to the hallway outside, and the Lab will be negative to the Ante room. The Ante room will have a transfer air connection to the lab space. A differential pressure monitoring system shall be provided between the hallway and Ante room, and the Ante room and Lab to ensure proper pressurizations are being met. An alarm will sound if the Lab is $-0.01''$ WC (adjustable) total between the lab and the hallway.

Chilled water piping will connect to the existing system near the existing AHU-23. Reheat piping will connect to the existing system in the hallway outside the Morgue. The new unit will connect to the

Plumbing Basis of Design

DESIGN REFERENCES

1. International Building Code
2. Uniform Plumbing Code, Edition 1997
3. Americans with Disabilities Accessibility Guidelines.

Plumbing work will include providing two new stainless steel hand sinks in the Lab. One sink will be in the Ante Room and one will be in the lab space. A new eye wash will be provided for the sink in the lab space.

The existing plumbing equipment will be removed. This includes a hand sink, and waste disposal unit. An existing floor sink and floor drain will also be removed.

The existing domestic mains are in the hallway outside the morgue. The valves for the branches can be found in the hallway. The branch lines also serve the bathrooms near the morgue. The new vent piping will reuse the existing VTR in the room.

Plumbing fixtures will be commercial grade as typically used in hospital/clinic type applications. Fixtures and faucets will be ADA compliant as required. Electric Sensor / hands-free faucets can be provided based on input/requests from the client.

See list below for general descriptions of fixtures being provided:

Fixture Type	Fixture Description
Ante room sink (S-1)	Stainless steel countertop sinks, Elkay Lustertone or equal with ADA compliant Chicago gooseneck faucets.
Lab sink (S-2)	Stainless steel countertop sinks, Elkay Lustertone or equal with ADA compliant Chicago gooseneck faucets. Built-in Emergency Eye-wash provided.

All fixtures will be provided with hot and cold water, and all hot water piping will be insulated. Hot water return piping will also be provided to the furthest fixture to ensure hot water is readily available to all fixtures.

No gas will be provided to the new lab hood.

Fire Protection Basis of Design

DESIGN REFERENCES

1. International Building Code
2. Uniform Fire Code, 2007 Edition
3. National Fire Protection Codes, including:
 - NFPA 10 Portable Fire Extinguishers

 - NFPA 13 Fire Sprinkler Systems

 - NFPA 90A Installation of Air Conditioning and Ventilation System

 - NFPA 101 Life Safety Code (For Egress and Life Safety items)

Fire Protection work will include relocating existing sprinkler heads as required and adding one new head in the Ante Room. The facility is currently served by an existing automatic wet pipe fire sprinkler system. The existing system will be modified as required to accommodate the new architectural layout. The project area is classified as light hazard in accordance with NFPA 13.

Electrical Basis of Design

DESIGN REFERENCES

1. International Building Code (IBC), 2006
2. NFPA 70, 2008, National Electrical Code
3. NFPA 101, 2012, Life Safety Code
4. Illuminating Engineering Society (IES) guidelines, standards, and recommended practices (RP) including but not limited to the following:
 - a. ANSI/IES RP-29-20, Recommended Practice: Lighting Hospital and Healthcare Facilities

Electrical work will include the removal of existing electrical and telephone devices and the installation of new electrical and telecom devices and equipment connections to support the conversion of the existing autopsy room to a new Covid Testing Lab.

The existing autopsy room currently receives power from existing 480/277V and 208/120V electrical panels located in the nearby Electrical Room 97. The existing telephone connection is sourced from a nearby Telecom Room. All existing electrical devices and light fixtures are to be removed and all conduit and conductors are to be removed up to the nearest upstream fixture. The existing telephone device is to be removed and the existing conduit and conductor are to be removed up to the nearest upstream device. Existing fire alarm device is to be removed and reinstalled for reuse.

The new Covid Testing Lab and Ante Room are not considered critical care and will not require power sourced from the critical care circuit. New work shall include the installation of standard and GFCI receptacles, which will be for convenience as well as dedicated outlets for the new workstation and lab hood. All receptacles are to be hospital grade. New equipment connections and disconnects will be provided for the new DOAS unit located within the lab as well as the new exhaust fan located on the roof above the lab. New telephone and data outlets will be provided near the new workstation. The existing fire alarm device will be relocated to match the new lab room footprint and a new fire alarm horn/visual device will be installed for the Ante Room.

Lighting will also be provided via new 2'x4' recessed LED light fixtures. Lighting controls for the Ante Room will consist of one light switch. Lighting controls for the Laboratory will include two light switches, where one switch controls half of the fixtures. Emergency lights shall be provided for the Ante Room and Laboratory. Emergency lights will be provided with an internal battery pack with a minimum operation time of 90 minutes.

Biosafety Basis of Design

The COVID-19 Testing Lab is designed to the guidelines outlined in the FGI Guidelines, by the NIH and by the CDC Guidelines:

Biological barriers will be used to maintain the laboratory environment and the outdoor environment below the permissible exposure limits to biological hazardous agents.

- Primary barriers consist of laboratory equipment used to protect the personnel from exposure to infectious agents.
- Secondary barriers represent the laboratory facilities providing protection of the indoor and outdoor environment from infectious agents.

In all instances, the latest edition of the U.S. Department of Health and Human Services Publication number (CDC) 93-8395 "Biosafety in Microbiological and Biomedical Laboratories" (BMBL) should prevail in specifying the provisions for primary and secondary barriers.

Per CDC Guidance, all laboratories and lab support spaces will be designed to biosafety level 2 (BSL-2) standards. BSL-2 is defined as suitable for work involving agents of moderate potential hazard to personnel and the environment. The access to the laboratory is restricted when work is being conducted.

Routine diagnostic testing of specimens can be processed in a BSL-2 laboratory using standard precautions. Interim laboratory biosafety guidelines for handling and processing specimens associated with COVID-19 routine diagnostic testing will be as follows:

- Using automated instruments and analyzers
- Processing initial samples
- Staining and microscopic analysis of fixed smears
- Examination of bacterial cultures
- Pathologic examination and processing of formalin-fixed or otherwise inactivated tissues
- Molecular analysis of extracted nucleic acid preparations
- Final packaging of specimens for transport to diagnostic laboratories for additional testing (specimens should already be in a sealed, decontaminated primary container)
- Using inactivated specimens, such as specimens in nucleic acid extraction buffer
- Performing electron microscopic studies with glutaraldehyde-fixed grids

Primary Barriers

Biological safety cabinets (BSC), Class II, are required for procedures with a potential for creating infectious aerosols or splashes and those where high concentration or large volumes of infectious agents are used. The COVID-19 testing lab will include a new fume hood for these requirements.

Secondary Barriers

- Laboratory doors should be self-closing and have locks in accordance with the institutional policies.
- Laboratories must have a sink for hand washing. The sink may be manually, hands-free, or automatically operated, and should be located near the exit door.
- The laboratory should be easily cleaned and decontaminated. Carpets and rugs are not permitted.
- Bench tops must be impervious to water and resistant to heat, organic solvents, acids, alkalis, and other chemicals.
- Laboratory windows that open to the exterior are not recommended.
- BSCs should be located away from doors, heavily traveled laboratory areas, and other possible airflow disruptions.
 - o Vacuum lines in-use are protected with liquid disinfectant traps and in-line HEPA filters or their equivalent.
 - o An eyewash station must be readily available.
 - o Mechanical ventilation systems should provide directional air flow into the laboratory rooms.
 - o Air should be exhausted to the exterior without recirculation.
 - o A method for decontaminating all laboratory wastes should be available in the facility (autoclave, chemical disinfection, incineration, or other validated decontamination method).

Biosafety Lab Design Features:

Secondary Barriers as outlined below will be included in the KVMH lab design.

- Lockable lab doors
- Sink for handwashing
- Easily cleaned work surfaces
- Benchtopy materials impervious to water
- Sturdy lab furniture
- Biological safety cabinets installed as needed
- Adequate illumination
- Safety shower/eyewash in lab

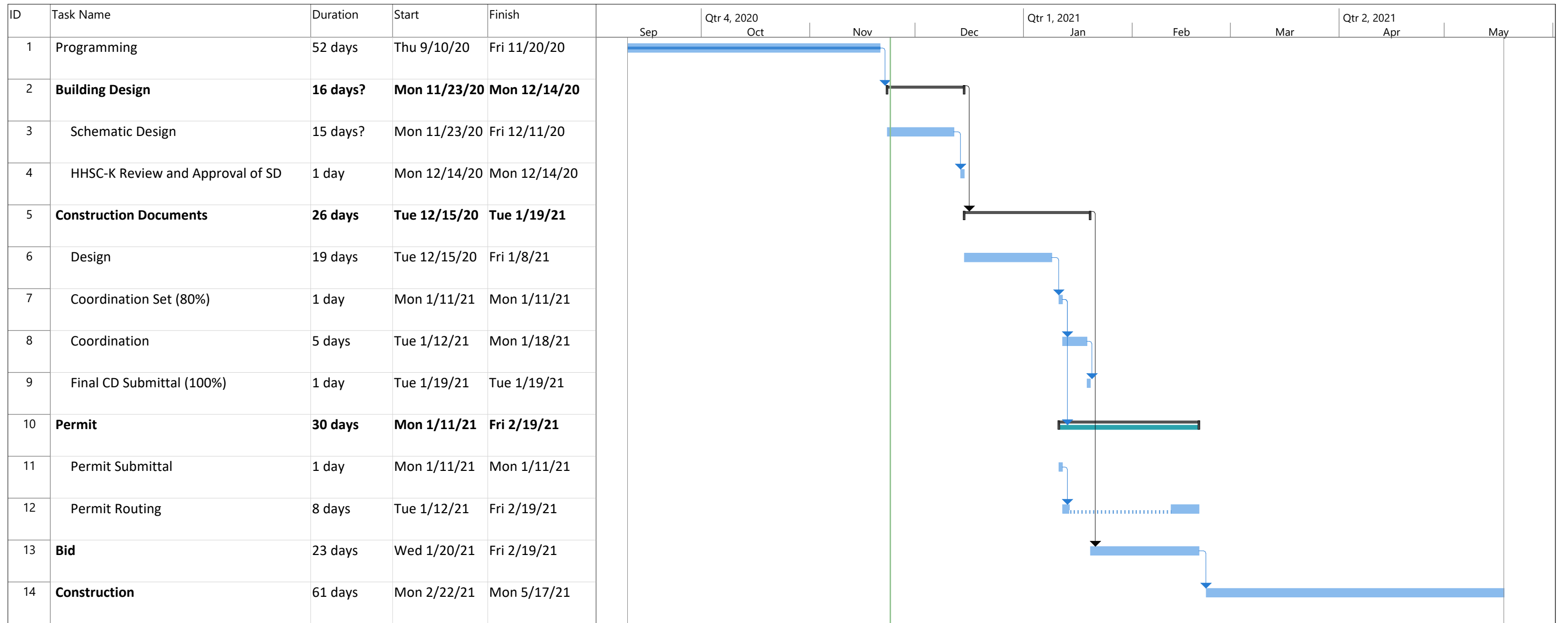
- No recirculation of lab area- 100% exhaust
- No public access to labs
- Autoclave available in or near labs
- Point-of-use polishers at lab sinks. This system provides point-of-use polishers at designated lab sinks. This option has the potential of having the lowest cost of all systems noted, depending upon how the polishers are funded (contractor cost versus Owner cost).

Biological Safety Cabinets

The Biological Safety Cabinet (BSC) is the principal equipment of the primary barriers, providing containment of infectious splashes or aerosols generated by microbiological procedures. Class II BSCs offer significant levels of protection to laboratory personnel and to the environment when used with good microbiological techniques. Class II biological safety cabinets also provide protection from external contamination of the products used inside the cabinet. The biological safety cabinets should be tested and certified at 12-month intervals and operated according to manufacturer's recommendations.

Table B1 - Biological Safety Cabinets Features and Applications

Type	Airflow Pattern	Connection to Exhaust System	Applications		Product Protections
			Nonvolatile Toxic Chemicals & Radionuclide	Volatile Toxic Chemicals & Radionuclides	
Class II, Type A2	70% recirculated through HEPA. 30% exhaust through HEPA into room or outdoors, plenum under negative pressurization	Canopy (air gap)	Yes	Yes, only when exhausted to outdoors (minute amounts)	Yes



Project: 20201124_Covid Lab-S
Date: Tue 11/24/20

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			

Appendix A

Site Aerial and Photos



1. Aerial Site Photo



2. Main Entrance



3. Adjacent Clinical Building



4. Corridors Leading to Morgue Department

Appendix B

Existing Site Photos



1. Overall Room Photo



2. Existing Condition



3. Existing Wall to Ceiling Condition



4. Wall to Ceiling Existing Condition



5. Roof Condition at Existing Autopsy Room

Appendix C

Lab Equipment Cut Sheets



User's Manual

Purifier[®] *Logic+* Biological Safety Cabinets Models

30231 Series	30238 Series
30241 Series	30248 Series
30251 Series	30258 Series
30261 Series	30268 Series

To receive important product updates,
complete your product registration card
online at **register.labconco.com**

TYPE
A2



*Protecting your
laboratory environment*

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Please read the User's Manual before operating the equipment.

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Warranty

Labconco provides a warranty on all parts and factory workmanship. The warranty includes areas of defective material and workmanship, provided such defect results from normal and proper use of the equipment. Glassware is not warranted from breakage when dropped or mishandled.

Purifier® Logic®+ Biological Safety Cabinets carry a five-year warranty from date of installation or six years from date of shipment from Labconco, whichever is sooner. Warranty is non-transferable and only applies to the owner (organization) of record.

This limited warranty covers parts and labor, but not transportation and insurance charges. In the event of a warranty claim, contact Labconco Corporation or the dealer who sold you the product. If the cause is determined to be a manufacturing fault, the dealer or Labconco Corporation will repair or replace all defective parts to restore the unit to operation. Under no circumstances shall Labconco Corporation be liable for indirect, consequential, or special damages of any kind. This statement may be altered by a specific published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments. Lamps and filters are not covered by this warranty. Damage due to corrosion or accidental breakage is not covered.

Returned or Damaged Goods

Do not return goods without the prior authorization from Labconco. Unauthorized returns will not be accepted. If your shipment was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damages.

The United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Limitation of Liability

The disposal and/or emission of substances used in connection with this equipment may be governed by various federal, state, or local regulations. All users of this equipment are required to become familiar with any regulations that apply in the user's area concerning the dumping of waste materials in or upon water, land, or air and to comply with such regulations. Labconco Corporation is held harmless with respect to user's compliance with such regulations.

Contacting Labconco Corporation

If you have questions that are not addressed in this manual, or if you need technical assistance, contact Labconco's Customer Service Department or Labconco's Product Service Department at 1-800-821-5525 or 1-816-333-8811, between the hours of 7:00 a.m. and 6:00 p.m., Central Standard Time.

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CAUTION – See Manual. When this symbol is on the unit it indicates a caution that is detailed in this manual.

ATTENTION - Voir manuel. Lorsque ce symbole est allumé l'appareil, il indique une mise en garde qui est indiqué dans ce manuel.

Chapter 1: Introduction

Congratulations on the purchase of a Labconco® Purifier Logic+® Biosafety Cabinet. The biosafety cabinet is designed to protect you, the product and the laboratory environment from biohazardous aerosols. The Logic+ is the result of years of experience in manufacturing biohazard cabinetry, and users like you suggested many of its features to us.

This biosafety cabinet offers many unique features to enhance safety, performance and ergonomics. To take full advantage of them, please acquaint yourself with this manual and keep it handy for future reference. If you are unfamiliar with how biosafety cabinets operate, please review *Chapter 4: Performance Features and Safety Precautions* before you begin working in the cabinet. Even if you are an experienced biosafety cabinet user, please review *Chapter 5: Using the Cabinet*; it describes the biosafety cabinet's features so that you can use it efficiently.

This manual and other technical information is available in PDF format at our website: www.labconco.com.



If the unit is not operated as specified in this manual it may impair the protection provided by the unit.

Si l'unité n'est pas utilisée comme spécifié dans ce manuel il peut diminuer la protection fournie par l'unité.

Chapter 2: Prerequisites

Before you install the Logic+, you need to prepare the site for installation. Examine the location where you intend to install the cabinet. You must be certain that the area is level and of solid construction. In addition, a dedicated source of electrical power must be located near the installation site.

Carefully read this chapter to learn:

- Location requirements.
- Electrical power requirements.
- Exhaust requirements.
- Service utility requirements.
- Space requirements.

Refer to *Appendix C: Specifications*, for complete biosafety cabinet electrical and environmental conditions, specifications and requirements.

Space Requirements

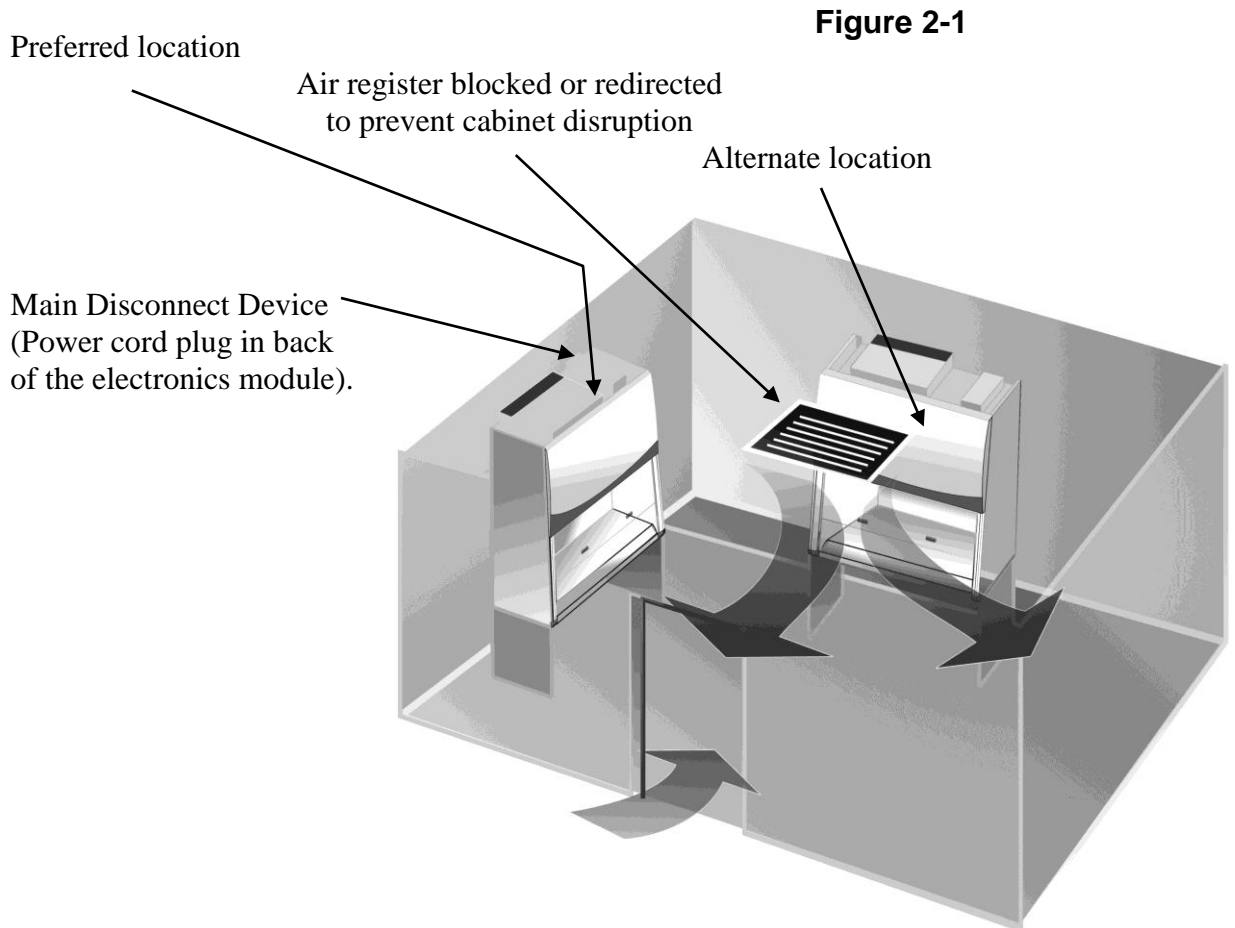
The dimensions for the Logic+ A2 biosafety cabinets are shown in *Appendix B: Dimensions*.

Clearance

A minimum clearance of at least 6 inches (150 mm) is suggested on the top and both sides of the cabinet for service.

Location Requirements

Note: The biosafety cabinet should be located away from traffic patterns, doors, fans, ventilation registers, fume hoods and any other air-handling devices that could disrupt its airflow patterns. All windows in the room should remain closed. Figure 2-1 shows the preferred location for the biosafety cabinet.



Do not position the unit so that it is difficult to operate the main disconnect device.

Ne placez pas l'appareil de sorte qu'il est difficile de faire fonctionner le dispositif principal de déconnexion.

Exhaust Requirements

If you intend to connect the biosafety cabinet to the optional Ventus™ Canopy Connection Kit, first examine the location to ensure that it accommodates the cabinet's exhaust duct. The area directly above the cabinet's exhaust port should be clear of structural elements, water and utility lines, or other fixed obstructions. There should be enough clearance to accommodate a 10-inch diameter duct. Avoid cabinet locations that require an elbow directly above the cabinet's exhaust connection or an excessive number of elbows in the exhaust system. For further information about the cabinet's exhaust system requirements, please refer to *Chapter 3: Getting Started*.

Electrical Requirements

The biosafety cabinet models have the following electrical requirements:

Table 2-1

Model #	Requirements
3023xxx0x	115 VAC, 60 Hz, 12 Amps
3023xxx1x	100 VAC, 50/60 Hz, 12 Amps
3023xxx-20, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 6 Amps
3024xxx0x	115 VAC, 60 Hz, 12 Amps
3024xxx1x	100 VAC, 50/60 Hz, 12 Amps
3024xxx-20, 30, 40, 50, 60, 70,80	230 VAC, 50/60 Hz, 6 Amps
3025xxx0x	115 VAC, 60 Hz, 16 Amps
3025xxx1x	100 VAC, 50/60 Hz, 16 Amps
3025xxx-20, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps
3026xxx0x	115 VAC, 60 Hz, 16 Amps
3026xxx1x	100 VAC, 50/60 Hz, 16 Amps
3026xxx-20, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps

Note: A dedicated outlet with an appropriate circuit breaker should be located as close as possible to the right rear side of the cabinet, at a height even with, or higher than, the top of the bench or stand. Consult your local electrical codes for properly rated circuit breakers. For safe operation the dedicated outlet must provide the protective earthing ground connection to the cabinet.

Note: On 100 and 115 VAC models, both electrical outlets are protected by a ground fault interrupter circuit (GFI). Labconco does not recommend plugging the biosafety cabinet into a GFI outlet.



Electrical outlets in the cabinet are restricted to 5 amps maximum current.

Prises électriques dans l'armoire sont limitées à 5 courant maximum ampères.



Do not use any detachable power cord that is not adequately rated for the unit.

Ne pas utiliser un fil électrique amovible qui n'est pas du tension nominale de l'appareil.

Service Line Requirements

All utility service lines should be ¼ inch O.D., brass, copper, or stainless steel, and equipped with an easily accessible shut-off valve. If the service line pressure exceeds 40 PSI, it must be equipped with a pressure regulator to reduce the line pressure.

Note: The use of flammable gases or solvents should be avoided in the biosafety cabinet. Open flame in the cabinet will disrupt the laminar airflow in the cabinet and may damage the HEPA filters. Flammable gases or solvents may reach explosive concentrations in the cabinet or ductwork. If you feel that the procedure requires the use of an open flame or flammable materials, contact the institution's safety office.

The use of air or gases under high pressure should be avoided as they may seriously disrupt the airflow patterns in the cabinet.

Chapter 3: Getting Started

Now that the installation is properly prepared, you are ready to inspect, install, and certify the Logic+ biosafety cabinet. This chapter covers how to:

- Unpack and move the biosafety cabinet.
- Install the cabinet.
- Connect the electrical supply source.
- Connect the service lines.
- Connect to an exhaust system (optional).
- Arrange certification of the biosafety cabinet.

Tools required for installation the biosafety cabinet include two 1/2" wrenches, a flat-blade screwdriver, a #2 Phillips screwdriver, and a carpenter's level.

Note: The biosafety cabinet models weigh between 400–700 lbs. (182-318 kg). The shipping pallet allows for lifting with a mechanical lift truck or floor jack. If you must lift the product manually, use at least six (6) persons and follow safe-lifting guidelines.

Unpacking the Biosafety Cabinet

Carefully remove the outer carton and inspect the cabinet for damage that may have occurred in transit. If the biosafety cabinet is damaged, notify the delivery carrier immediately and retain the entire shipment intact for inspection by the carrier.

Note: United States Interstate Commerce Commission rules require that claims be filed with the delivery carrier within fifteen (15) days of delivery.

Do not return goods without the prior authorization of Labconco. Unauthorized returns will not be accepted.

If the cabinet was damaged in transit, you must file a claim directly with the freight carrier. Labconco Corporation and its dealers are not responsible for shipping damages.

Do not discard the carton or packing material for the biosafety cabinet until all of the components have been checked, installed and tested.

The cabinet is secured to the pallet in two places on each side. To access the nuts and bolts, remove the side panels by removing and keeping the two Phillips screws on both panels. Swing the front of each panel away from the cabinet, and lift it straight up to remove the panel from the cabinet.

Note: The side panels must be removed to access the fasteners that secure the biosafety cabinet to the pallet. **DO NOT ATTEMPT TO LIFT THE BIOSAFETY CABINET BY THE SIDE PANELS; DAMAGE WILL OCCUR.**

Preparing the Biosafety Cabinet for Operation

Installation instructions (Labconco P/N 1056801) are attached to the sash of the biosafety cabinet. If these instructions are missing or unclear, contact Product Service at 800-821-5525 or 816-333-8811. The following are located in a box underneath the work surface:

- User's Manual CD
- Drain Valve Assembly and fasteners
- Power Cord
- Product Registration Card
- Vacu-Pass™ Accessories (optional)

If you did not receive one or more of the components listed for the cabinet, or if any of the components are damaged, contact Labconco Corporation immediately for further instructions.

Moving and Lifting the Cabinet

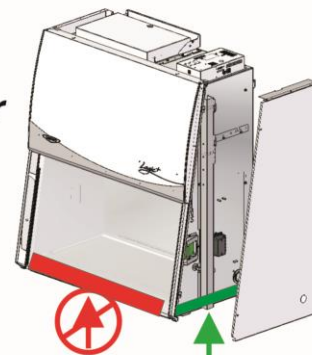
Move the cabinet, attached to its pallet, by using a floor jack, or a furniture dolly underneath the unit. **DO NOT** move the cabinet by tilting it onto a hand truck.

When lifting the cabinet **DO NOT** lift the cabinet in the middle front area of the hull. Lifting here may bend or distort the bottom of the cabinet, causing damage to the unit.

**NOTE: Damage will occur
Do not lift or support front center
or side dress panels**

This label to remain until installation is complete

p/n 10609



Lift on sides and back only

Installing the Biosafety Cabinet on an Existing Work Surface

Note: The biosafety cabinet is very top heavy. Use caution when lifting or moving it.

When installing the biosafety cabinet onto an existing work surface or benchtop, ensure that the structure can safely support the combined weight of the cabinet and any related equipment. The work surface should be at least as wide as the cabinet and 31 inches (787 mm) deep to properly support the unit.

A hole or notch may be cut in the supporting surface in the right front corner to accommodate the optional drain valve.

Installing the Cabinet on a Labconco Base Stand

Labconco offers accessory Base Stands in a variety of configurations to suit your particular needs. Stands can be ordered with adjustable telescoping legs or with a manually or electrically adjustable hydraulic lift.

Telescoping Base Stands

These stands are included with some Logic+ models, or are available separately. The base stands for each width cabinet are listed in Table 3-1 below. An optional caster wheel kit is available (part # 3730500).

Table 3-1

Width	Base Stand w/Feet Model #
3'	3401003
4'	3401004
5'	3401005
6'	3401006

Manual or Electric Hydraulic Lift Base Stands

These base stands offer infinitely adjustable height between 25.5 and 33.5 inches (648 to 851 mm), giving a cabinet work surface height of 28.0 to 36.0 inches. The height is adjusted either by a manual (hand crank) or electric pump that drives hydraulic rams in the legs of the stands. All of the hydraulic stands are equipped with fixed feet, but can be converted to caster wheels with the addition of Caster Kit #3784000. The base stands for each cabinet size is listed in Table 3-2 below.

Table 3-2

Width	Manual Lift Stand #	Electric (115V) Lift Stand #	Electric (230V) Lift Stand #
3'	3780200	3780100	3780103
4'	3780201	3780101	3780104
5'	3780203	3780106	3780107
6'	3780202	3780102	3780105

Note: When installing the cabinet on the hydraulic lift base stand, ensure that the hydraulic lines and the electrical cord are clear of any obstructions before installing the cabinet on the stand or operating the lift system.

SoLo™ Electric Hydraulic Lift Base Stands

These base stands permit the Logic+ to be lowered enough to be transferred through a standard doorway as low as 78 inches. Casters provide mobility and lock in place. The SoLo Stands for each Purifier Logic+ series model is listed below.

	115V SoLo Stand #	230V SoLo No. America Plug #	230V SoLo UK Plug #	230V SoLo Schuko Plug #	230V SoLo China/Australia Plug #
3'	3780310	3780314	3780330	3780334	3780338
4'	3780311	3780315	3780331	3780335	3780339
5'	3780312	3780316	3780332	3780336	3780340
6'	3780313	3780317	3780333	3780337	3780341

Connecting the Biosafety Cabinet to Utility Service Lines

Note: Some models have a solenoid valve connected to the service valve on the right side, rear position. The solenoid prevents gas from flowing to the service valve when the unit blower is off. It is the only service valve position that can be fitted with a solenoid valve. Connect the gas service to the solenoid valve.

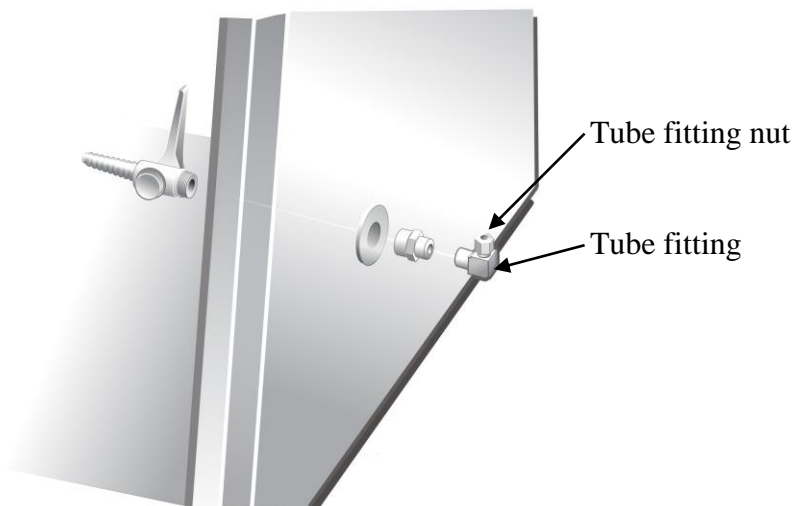
The service lines (if any) should be connected to the tube fitting(s) on the outside of the liner wall as shown in Figure 3-1. To install the tubing, follow these steps:

1. Ensure that the tubing is $\frac{1}{4}$ inch O.D., soft metal, and that the end has been completely deburred.
2. Route the tubing from the rear of the cabinet, ensuring that it will line up with the slot in the back of the side panel. The slot is located from $8\frac{3}{4}$ to $11\frac{1}{4}$ inches (222 to 288 mm) from the bottom of the cabinet.

Note: Make sure that the tube routing will not contact any electrical wires. DO NOT loop service line tubing within the side panels of the cabinet.

3. Make sure that the nut on the tube fitting is loose, but do not remove it. Look inside the fitting to make sure the tube ferrule is there.
4. Push the tube into the fitting until it is properly seated. The tube will go approximately $\frac{3}{4}$ inch (19 mm) into the fitting.
5. Tighten the tube fitting nut hand tight and then, using a $\frac{7}{16}$ -inch wrench, tighten it at least $\frac{3}{4}$ turn more.
6. Close the service valve in the biosafety cabinet and then slowly open the shutoff valve on the service valve. Test all fittings for leakage. Tighten the tube nut slightly if needed.

Figure 3-1



Optional Ventus™ Canopy Exhaust Connection

Certain applications such as working with odorous products or volatile toxic materials will require the connection of the biosafety cabinet to an exhaust system.

Note: The canopy connection, also referred to as a thimble or air gap connection, allows single or multiple biohazard cabinets to be connected to an exhaust system. During operation, the exhaust system draws all of the cabinet's exhaust air, plus a volume of room air (through the vent in the canopy) into the exhaust duct. Canopy connections function as a "shock absorber" allowing the system to function properly during changes in room air pressure.

For information on selecting a canopy connection, go to *Appendix D: Accessories*.

Note: If the research involves the use of toxic compounds or volatile materials, contact the facility's safety officer or Labconco to ensure that the biosafety cabinet and its exhaust system are compatible with the materials you will be working with.

Optional Vacu-Pass™ Cord & Cable Portal Use

Note: There must be enough clearance to pass the cord or cable between the Logic+’s exterior dress panel and any obstruction.

Note: Some Vacu-Pass components and the cord or cable passing through it may become contaminated during use of the cabinet. Ensure all potentially contaminated components are surface decontaminated before handling or removal from the cabinet.

1. Remove the grommet from the liner side wall. Remove the solid sealing plug from the body of the portal by either pressing it through from the outside, or by carefully inserting a spatula or similar device between the sealing plug and the body of the portal, and prying the plug out.
2. Pass the cord or cable through the body of the portal, and then through one of the plugs that has been cut for cord or cable use, then through the grommet, as shown in Figure 3-2.

Note: select a plug with a hole that is slightly smaller than the cord or cable, to create a proper seal. This will also help minimize movement of the cord or cable if it is accidentally pulled during use.

Figure 3-2



3. Position the cord or cable as it will be used in the cabinet, and then push the plug back into the body of the portal until it seats in the portal. Reinstall the grommet.

Drain Valve Installation

In order to prevent damage during shipping, the drain valve assembly has not been installed. If desired, the valve should be installed after the cabinet is in its final location.

To install the valve assembly, follow these steps:

Note: The work surface is heavy. Use caution when handling it.

4. Lift the work surface out of the biosafety cabinet by lifting on the knobs at the front of the work surface. Steady the work surface while pulling it straight out the front of the cabinet.
5. Using a putty knife, remove and discard the stainless steel cover that is sealed over the drain mounting holes. Scrape out remaining sealant that is around the holes.
6. Apply a light coating of silicone sealant (user supplied) to the mounting surface of the drain assembly. Attach the drain assembly under the bottom of the cabinet as shown in Figure 3-3. Wipe off any excess sealant from the cabinet bottom. Ensure that the center drain hole is unobstructed.
7. Make sure the drain valve is in the closed position.
8. Reinstall the work surface.
9. Allow the silicone sealant to cure for at least eight hours before exposing it to liquid.

NOTE: The drain valve assembly attaches to the underside of the cabinet bottom.

Apply a light coat of silicone sealant to this surface of the connector, aligning the three holes in the connector with the three holes in the biosafety cabinet liner.

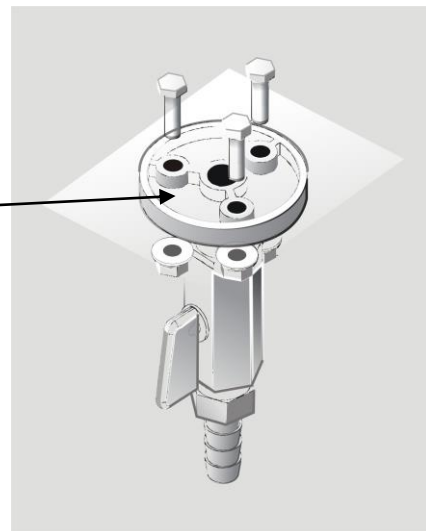


Figure 3-3

Initial Certification

Prior to use, a qualified certifier should certify all biosafety cabinets. Under normal operating conditions, the biosafety cabinet should be recertified at least annually and when relocated or serviced. The certifier should perform the following tests, as recommended in ANSI/NSF International Standard Number 49 in effect when the cabinet was manufactured:

- Downflow Velocity Profile Test
- Inflow Velocity Test
- Airflow Smoke Patterns
- HEPA Filter Leak Test
- Optional Canopy Alarm Test and Operation
- Vibration Test *
- Noise Level Test *
- Lighting Intensity Test *

*These tests are user comfort related tests and may be omitted at the user's or certifier's discretion.

If you have any questions regarding certification agencies or need assistance in locating one, contact Labconco's Product Service Department at 1-800-522-7658 or 816-333-8811.

Chapter 4: Performance Features and Safety Precautions

All Purifier Logic+ Biosafety Cabinets operate using the following principles:

- Filtration and retention of particulates by High Efficiency Particulate Air (HEPA) filter(s)
- Laminar airflow
- Directional airflow

The major components in a biosafety cabinet are:

- The HEPA filter(s) or optional ULPA filters
- The motor/blower to force air through the cabinet
- Cabinet air intakes (grilles), ductwork and air balance controls

HEPA Filters

HEPA filters are disposable, dry-type particulate filters. The filter material or media is typically made of borosilicate microfibers formed into a thin sheet, in a process similar to the production of paper. This sheet is folded, or pleated to increase its surface area. The pleats are typically held in place by beads of glue that add rigidity to the media pack. The pack is then set into a frame, and sealed as shown in Figure 4-1.

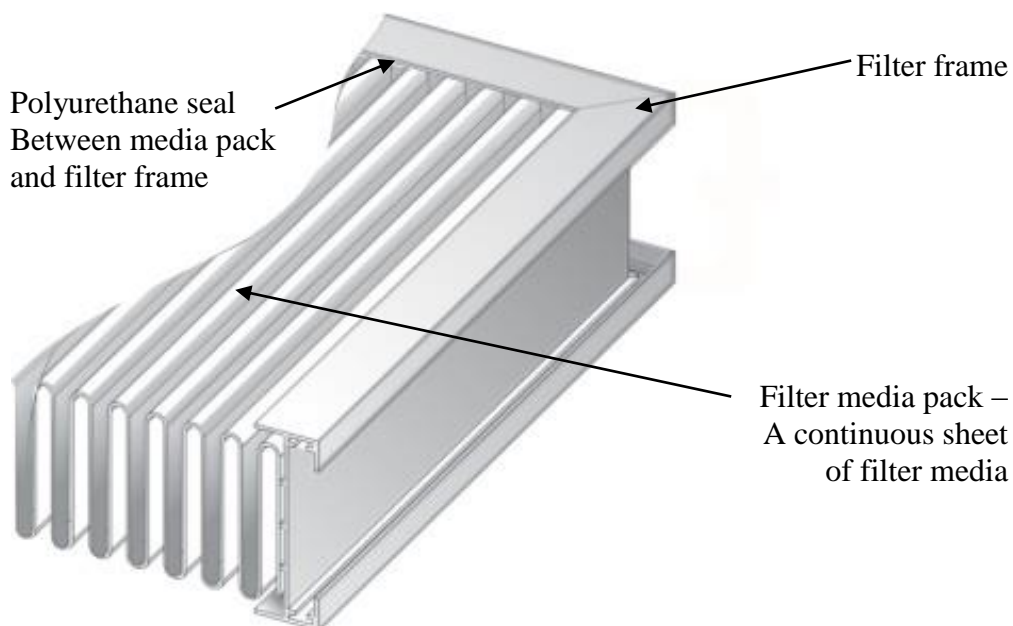
The HEPA filter manufacturer establishes the efficiency of the filter by challenging it with an aerosol of known particle size. The number of particles that penetrate the filter are quantified, and this establishes the efficiency of the filter. Thus, the filters used in the Logic+ cabinets are at least 99.99% efficient in removing particles 0.3 micron.

Chapter 4: Performance Features and Safety Precautions

Note: The HEPA filter media is very fragile. DO NOT touch the media. If you think the media of a HEPA filter is damaged, DO NOT USE THE CABINET. Have the HEPA filter integrity tested by a certifier before using the cabinet.

Note: HEPA Filters are only effective against particulate material. Gases will pass through the filter.

Figure 4-1



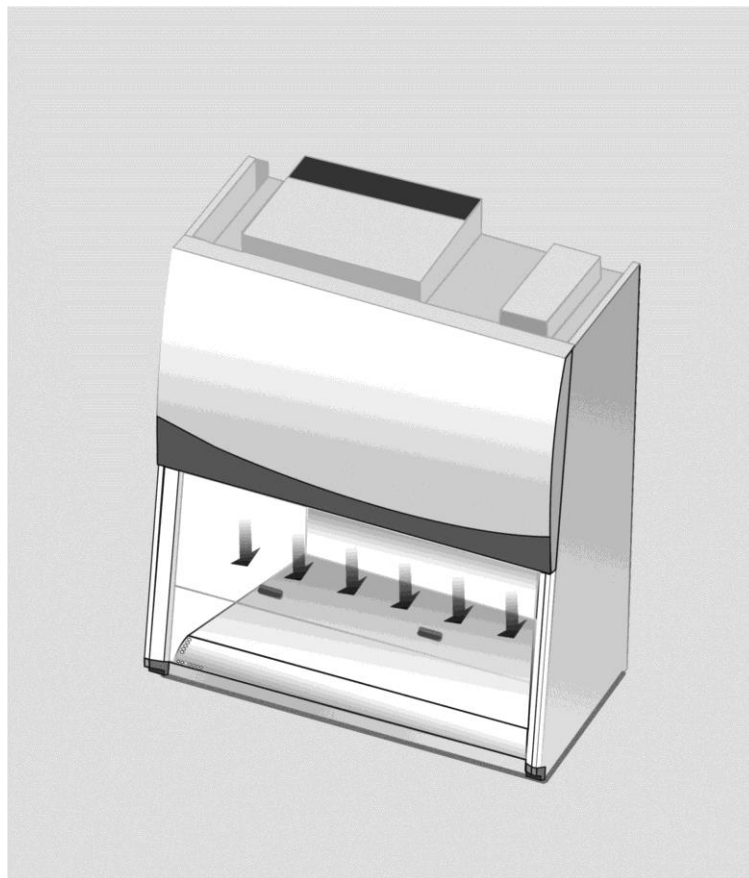
ULPA Filters

Optional ULPA filters may be used to replace the standard HEPA filters in the Purifier Logic+ biosafety cabinets. ULPA filters have the same properties as described above except they are rated at least 99.999% efficient in removing particles 0.1-0.2 or 0.2-0.3 micron.

Laminar Airflow

Laminar airflow is defined as the movement of a body of air in a single direction, with a uniform velocity. In practice, the laminar downflow of air in the cabinet captures any aerosol generated in the work area of the cabinet, and directs it to the HEPA filters. In order to be true laminar downflow, a number of individual downflow velocity test points (The Downflow Velocity Profile) must be ± 16 feet per minute (0.08 m/s) of the average of all the test points. This is illustrated in Figure 4-2.

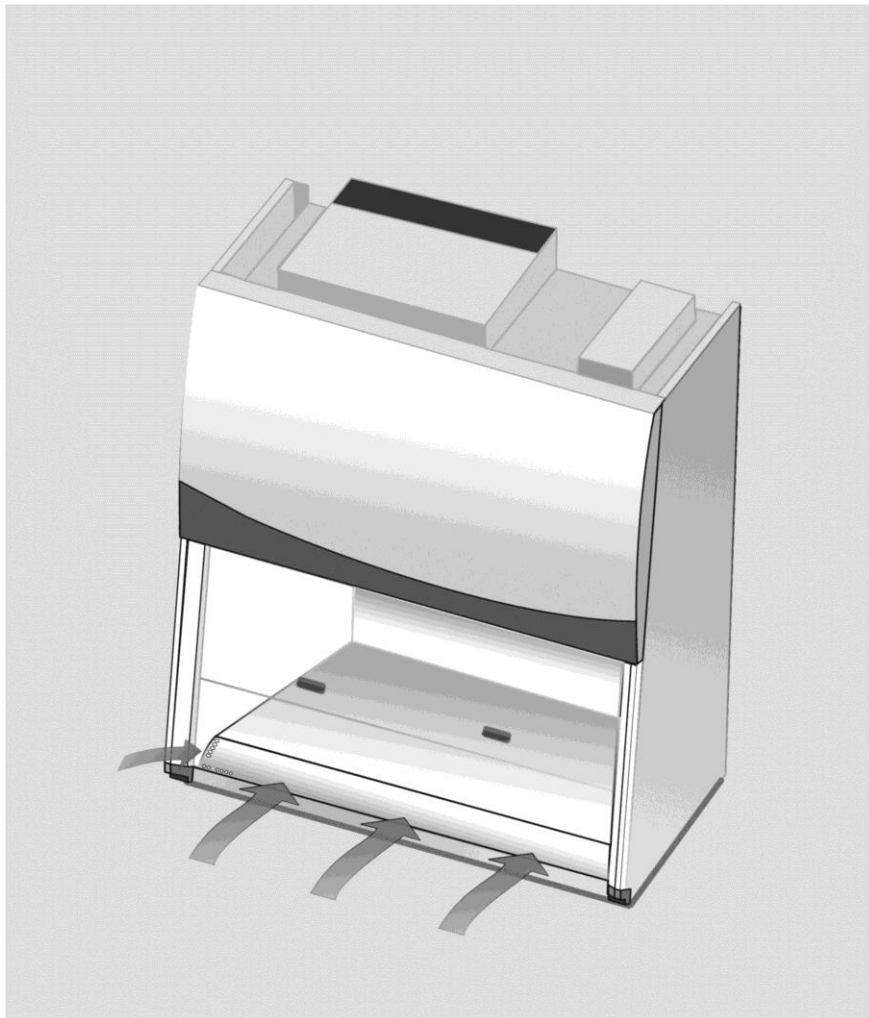
Figure 4-2



Directional Airflow

Directional airflow also plays a key role in biosafety cabinet performance. Air is drawn into the front of the cabinet at the front grille. This “curtain” of air makes it more difficult for aerosols to escape out of the work area of the cabinet and into the outside environment. This airflow is often calculated and referred to as the **Inflow Volume** or **Average Inflow Velocity**. This is illustrated in Figure 4-3.

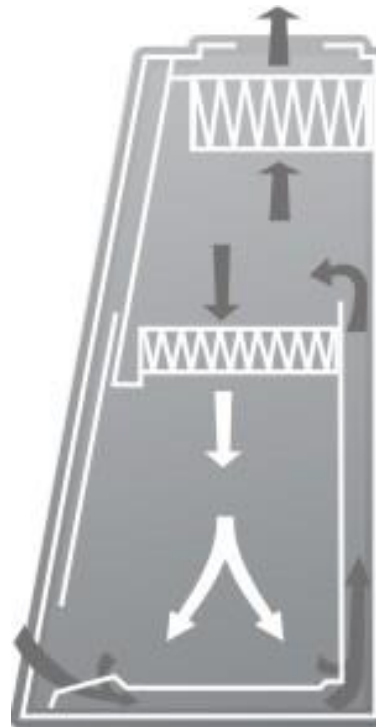
Figure 4-3



Motor/Blower

The motor/blower assembly pulls room air into the front of the cabinet, and re-circulates it internally. During its recirculation, the air is split into two separate streams. One path leads through the exhaust HEPA filter and out of the unit. The second path flows through the supply HEPA filter, which then flows down through the work area, as shown in Figure 4-4. The motor in the Logic+ cabinet is an electronically commutated motor (ECM). The ECM is a brushless DC motor that includes its own power supply to convert the incoming alternating current to direct current, as well as its own microprocessor to control and measure the motor's operation. The motor utilizes Labconco's exclusive Constant Airflow Profile™ (CAP) program to deliver a consistent volume of air, throughout the life of the cabinet.

Figure 4-4



Cabinet Air Intakes (Grilles), Ductwork and Air Balance Controls

The location, size, and pattern of the grilles at the front and rear of the work area affect cabinet containment and performance.

Note: Do not block or obstruct the grilles of the biosafety cabinet.

The internal ductwork of the biosafety cabinet conveys the air from the work area to the blower, and then from the blower to the filters. The positive pressure rigid plenum of the biosafety cabinet is designed to deliver a more uniform airflow to both HEPA filters, optimizing filter loading and operational life.

Ultraviolet (UV) Lamp

The optional UV lamp generates a primary wavelength of light of 254nm. A secondary emission is in the visible (blue) wavelength, resulting in the characteristic blue color while operating. UV light at this wavelength is biocidal, primarily by creating thymine dimers in DNA. These dimers prevent the correct transcription of the DNA into RNA, resulting in cellular death or viral inactivation. In order to be effective, the UV light must directly strike the nucleic acid, and its effectiveness can be diminished or negated by dissolved proteins or metals, or by other UV-opaque substances protecting the target nucleic acid.

Because of its limitations, UV light should be used as an adjunct to good surface disinfection practices. In order to get optimum performance from the UV light, it should be replaced after 6,000 hours of operation or less, and the exterior surface of the lamp should be kept clean and free of dust.

Note: The Logic+ records the number of hours of operation of the UV light. You can program in the number of hours (in 100-hour increments) it will operate before a replacement message is displayed.

Note: UV irradiation is absorbed by the tempered safety glass of the sash. Independent research has shown that the level of UV irradiation on the outside of the cabinet's sash is equal to background radiation levels.

Note: The UV sensitivity of a target organism varies, depending on the UV output of the lamp, the genus and species of the organism, the medium the agent is suspended in, etc. Contact the Health and Safety Officer at your facility for UV light use and recommendations.

Safety Precautions

Note: The biosafety cabinet should be certified by a certification technician before its initial use. The cabinet should be recertified whenever it is relocated, serviced or at least annually thereafter. Filter integrity and airflow performance should be verified before using the cabinet.

Some internal components of the biosafety cabinet may become contaminated during operation of the unit. Only experienced personnel competent in decontamination procedures should decontaminate the cabinet before servicing these components. If you have any questions regarding certification agencies, or need assistance in locating one, contact Labconco's Product Service Department at 800-821-5525 or 816-333-8811.

DO NOT load more than 50 lbs. (23 Kg) in the work area. Exceeding this limit may damage the work surface and its supports. Excessive weight in the cabinet may increase the risk of it overturning, or failure of hydraulic lift stands, resulting in the cabinet and stand overturning. If your application requires loading more than 50 lbs., contact Labconco's Product Service Department at 800-821-5525 or 816-333-8811 for assistance.

Ensure that the cabinet is connected to electrical service in accordance with local and national electrical codes. Failure to do so may create a fire or electrical hazard. Do not remove or service any electrical components without first disconnecting the biosafety cabinet from electrical service.

Avoid the use of flammable gases or solvents in the biosafety cabinet. Care must be taken to ensure against the concentration of flammable or explosive gases or vapors. An open flame should NOT be used in the biosafety cabinet. Open flames will disrupt airflow patterns, burn the HEPA filter and/or damage the filter's adhesive. Gases under high pressure should not be used in the biosafety cabinet, as they may disrupt its airflow patterns.

HEPA filters only remove particulate matter. Operations generating volatile toxic chemicals or radionuclides must be evaluated carefully.

The media of HEPA filters is fragile and should not be touched. Avoid puncturing either HEPA filter during installation or normal operation. If you suspect that a HEPA filter has been damaged, DO NOT use the cabinet; contact a local certification agency or Labconco at 800-821-5525 or 816-333-8811 for re-certification information.

The HEPA filters in the biosafety cabinet will gradually accumulate airborne particulate matter from the room and from work performed in the cabinet. The rate of accumulation will depend upon the cleanliness of the room air, operating time and the nature of work being done in the cabinet. The Filter Gauge accurately displays the amount of filter life remaining.

Chapter 4: Performance Features and Safety Precautions

Proper operation of the cabinet depends largely upon its location and the operator's work habits. Consult the Installation and Normal Operation sections of this manual for further details.

Avoid direct exposure of plastic or coated materials to ultraviolet (UV) radiation. Never bypass the UV safety interlock that only allows the UV light to work when the sash is closed. When surface disinfecting the biosafety cabinet:

- Avoid splashing the disinfecting solution on skin or clothing.
- Ensure adequate ventilation.
- Carefully follow the disinfectant's safety instructions.
- Always dispose of disinfecting solutions in accordance with local and national laws.
- DO NOT allow disinfectants with high concentrations of free chlorine to contact the stainless steel components of the biosafety cabinet for a long period of time. Free chlorine will corrode stainless steel after extended contact.

Biosafety cabinets should be decontaminated for any of the following reasons:

- Before maintenance work requiring entry into contaminated areas.
- Before HEPA filter changes.
- Before performing certification tests requiring entry into contaminated areas.
- Before relocating the cabinet.
- Before changing research programs.
- After the gross spill of biohazardous material or toxic chemicals.

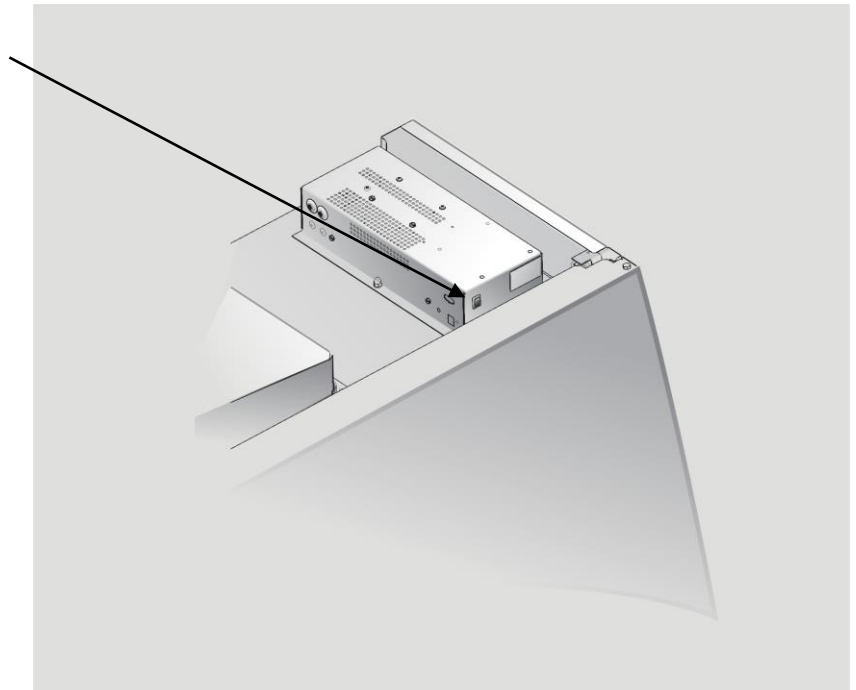
Chapter 5: Using the Cabinet

System Reset Switch

The biosafety cabinet has a system reset switch for resetting its microprocessors. The switch is located on the front of the electronics module, on top of the cabinet, as shown in Figure 5-1. Ensure that the switch is in the “ON” (up) position before attempting to operate the cabinet.

Figure 5-1

The System Reset
Switch



Information Center

The Information Center is an LCD display located on the right side wall at eye level. When the blower is started, the words “please wait” will be displayed, as shown in Figure 5-2. After approximately 90 seconds, the display will switch to normal operation.

The display provides a clock, the remaining filter life, the cabinet’s current status, inflow and downflow velocities (if equipped with the optional airflow sensor), as shown in Figure 5-3. In the event of an alarm, the Information Center will immediately display a context sensitive display indicating the cause of the alarm, and possible solutions, as shown in Figure 5-4.

The display will enter sleep mode, turning itself off, one minute after the blower is turned off or the sash is closed.

Figure 5-2

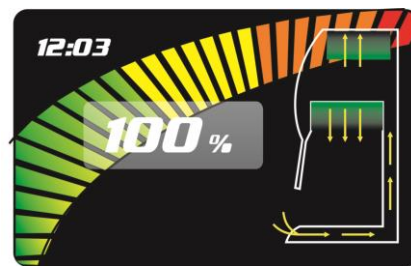
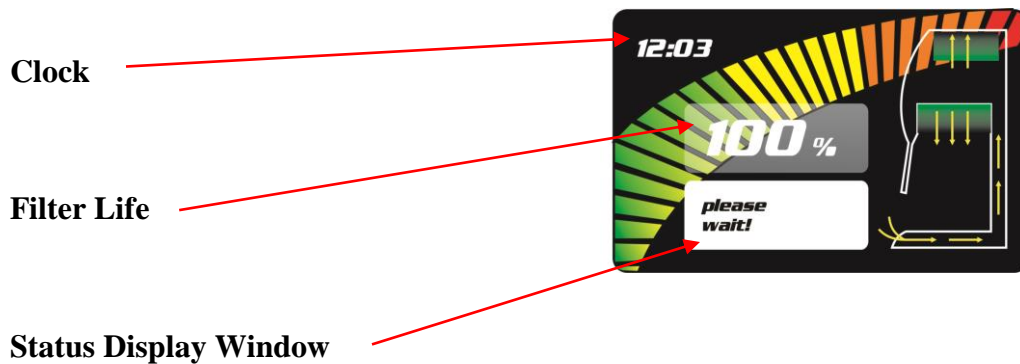


Figure 5-3



Alarm Screens

Sash is too high

The sash is open too far for safe operation.

Figure 5-4a



Airflow Alert

The airflow patterns in the cabinet have changed, resulting in a sudden change in the motor speed. This is most likely due to a blockage of the grille or the exhaust filter outlet. It may also be caused by removal of the work surface while the cabinet is in operation.

Figure 5-4b



Airflow Alarm

If equipped with the optional airflow sensor and the inflow or downflow velocities are excessively high or low, this alarm will be displayed.

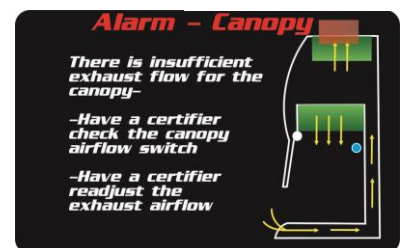
Figure 5-4c



Canopy Alarm

If equipped with the optional canopy connection, and there is insufficient exhaust system airflow, this alarm will be displayed. If this alarm is displayed, the Logic+ blower will need to be turned off, and then back on again to reset the alarm.

Figure 5-4d



System Error

The motor and display circuit board are not communicating properly. DO NOT USE THE CABINET UNTIL THE PROBLEM HAS BEEN CORRECTED.

Figure 5-4e



Operating the Sliding Sash

The counterbalanced, anti-racking sash mechanism requires only a few pounds of force to move the sash up or down. You can open or close the sash smoothly with one or two hands positioned on either handle.

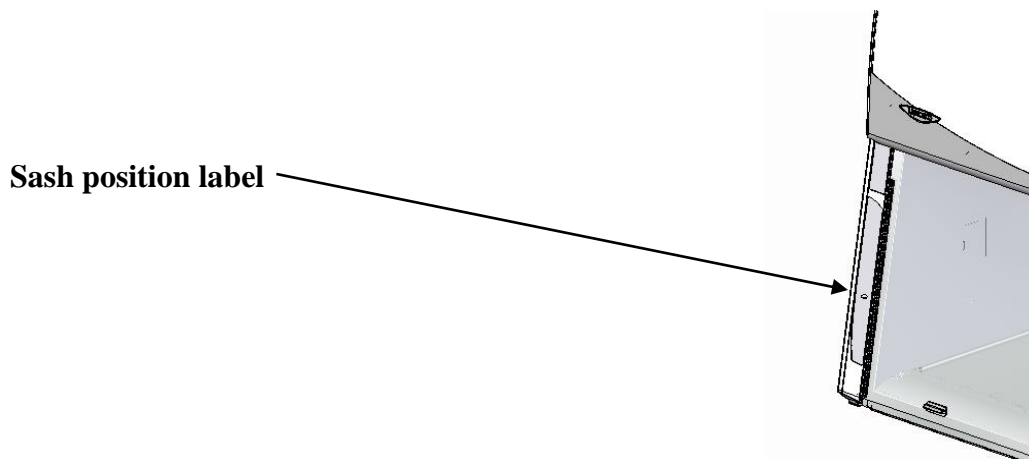
The sash position alarm and safety interlock system senses the sash position and acts appropriately. The biosafety cabinet has been programmed to operate at either an 8- or 10-inch (203-254 mm) sash opening, depending on model. Raising the sash above its operating height will activate the audible and visual alarms. The audible alarm can be temporarily muted (for approximately five minutes) by depressing and releasing the **OK/Mute** button. Closing the sash back to its operating position will reset the alarm and defeat the muting of the alarm. The safety interlock system senses when the sash is closed and allows the optional ultraviolet (UV) lamp to operate only when the sash is closed, to protect the operator from irradiation.

Starting the Biosafety Cabinet

1. To start the biosafety cabinet, raise the sash until its bottom edge aligns with the sash position label on the left corner post. The decal is shown in Figure 5-5.
2. Press the blower button to start the unit. The unit will display a standby screen for approximately 90 seconds to allow the cabinet to reach proper operating conditions. If the alarm sounds, recheck the sash position. If the sash is too high, the sash audible alarm and the LCD display will indicate the sash is too high.
3. To turn the UV light on, the sash must be completely closed to prevent the escape of any UV radiation. Push the UV light button to activate the UV light.

Note: The sash must be completely closed for the UV light to activate.

Figure 5-5



The Logic+ Touchpad

The touchpad of the Logic+ is shown in Figure 5-6. Take a moment to get familiar with the buttons, their locations and functions. Also familiarize yourself with the display located on the right side wall. The display will report system functions, such as filter capacity, timer displays, alarm or error messages, as well as icons that illuminate when cabinet functions such as UV light and blower are operational.

Figure 5-6

Blower Button – Starts or stops the cabinet blower. When the blower is in Smart-Start™ mode, opening the sash from the closed position turns the blower on automatically. In Night-Smart™ mode, when the sash is closed, the motor slows to idle to maintain air cleanliness in the work area. When the sash is reopened, the blower resumes normal operation. Pressing this button overrides Smart-Start and Night-Smart operation.

Light Button – Turns the fluorescent lamps on or off. Closing the sash automatically turns the lights off. When the lights are in Smart-Start mode, raising the sash turns the lights on automatically.

Outlet Button – Turns the electrical outlets in the work area on or off.

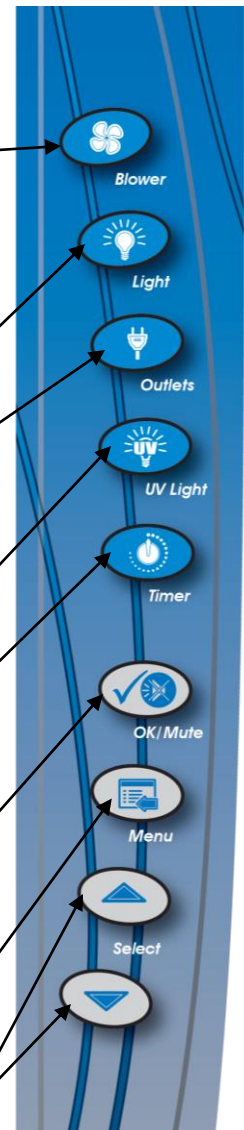
UV Light Button – Turns the UV lamp on or off. When the UV lamp is in Smart-Start mode, closing the sash turns the light on. When the sash is raised, the light turns off automatically.

Timer Button – Allows you to select either a repeating interval timer, or an elapsed timer (stopwatch).

OK/Mute Button – Mutes all audible alarms for approximately 5 minutes, unless there is a system error alarm. When in the Menu mode, this button is used to select an option.

Menu Button – This button toggles the display between the display and menu modes. When in the menu mode, pressing this button returns you to the previous menu level.

Select Buttons – Allow you to choose different options in the menu mode.



Navigating the Logic+ Menu Screens

MyLogic™ allows you to use the Smart-Start or Night-Smart features that activate functions automatically when the sash is opened or closed.

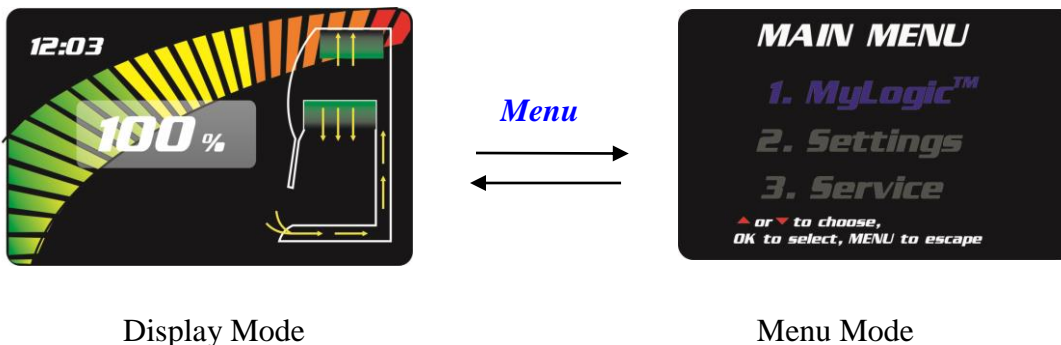
If equipped, the UV lamp can be programmed to operate for a given time interval when the sash is closed, before it shuts off.

NOTE: When you are in the menu mode, if a selection is not made within 30 seconds, the display will reset back to display mode.

Keypad operations are shown as *blue bold italic*. Menu screen selections are shown as *green italics*.

NOTE: Pressing the appropriate touchpad button will override Smart-Start or Night-Smart selections.

To access the menu, press the *Menu* button. The display panel will show the first level menu. To select from the various menu options press the ▲ or ▼ buttons until the selected option is displayed. Press *OK* to accept that option, or press *Menu* to return to the previous menu level.

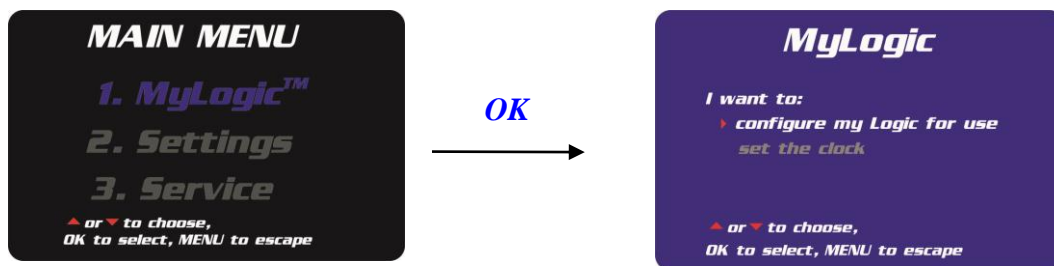


Navigating the MyLogic™ Menu Screens

The MyLogic screens will allow you to set the cabinet's clock, and to personalize its operation. Please note all MyLogic screens have a blue background.

Setting the Clock

Using the ▲ and ▼ buttons on the touchpad, highlight the *MyLogic* option-it will turn blue when selected. Press **OK** to enter the first MyLogic screen:



Using the ▲ and ▼ buttons on the touchpad, highlight *set the clock* -it will turn white when selected. Press **OK** to enter the first clock setting screen:

At this screen, select whether you want the clock to display in a 12- or 24-Hour format. When you have highlighted your choice, press **OK** to go to the next screen...



Use the ▲ and ▼ buttons to select the hour, and press **OK**...



Use the ▲ and ▼ buttons to select the minute, and press **OK** to return to the first MyLogic screen.



Configuring the Logic+

In the first MyLogic screen, use the ▲ and ▼ buttons on the touchpad to highlight *configure my Logic for use* -it will turn white when selected. Press **OK** to enter the first configuration screen:

The first screen gives you the option of activating the Smart-Start option for the blower; if you want the cabinet blower to start every time you raise the sash, select *start*, and then press **OK**. If *not start* is selected, then the blower must be manually started from the keypad. When **OK** is pressed, the next configuration screen will appear.

The next screen gives you the option of activating the Smart-Start option for the fluorescent light; if you want the lights to turn on every time you raise the sash, select *turn on*, and then press **OK**. If *stay off* is selected, then the lights must be manually turned on from the keypad. When **OK** is pressed, the next configuration screen will appear.

If you want the cabinet blower to run slowly, maintaining reduced airflows every time you close the sash, select *go into Night-Smart mode* and then press **OK**. If *stop* is selected, then the blower will stop when the sash is closed. When **OK** is pressed, the next configuration screen will appear.

If your Logic+ is configured for a UV light, then you will see the next two screens; if you want the UV lamp to turn on every time you close the sash, select *go into Night-Smart mode*, and then press **OK**. If *stay off* is selected, then the UV light will not turn on when the sash is closed. When **OK** is pressed, the final configuration screen will appear.



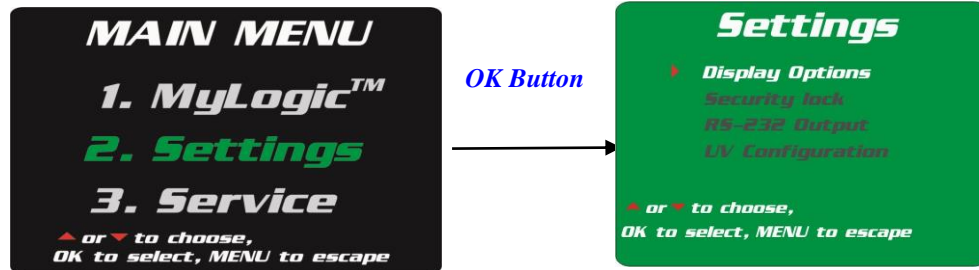
If you choose to use Night-Smart option for the UV lamp, this screen allows you to control the time the UV lamp will remain on after the sash is closed. Use the ▲ and ▼ buttons on the touchpad to cycle through the time intervals available, and then press **OK** to select it. The screen will then return to the first MyLogic screen.



Navigating the Settings Menu Screens

The Settings screens will allow an administrator to set some of the cabinet's operational parameters. Please note all Settings screens have a green background.

Using the ▲ and ▼ buttons on the touchpad, highlight the *Settings* option-it will turn green when selected. Press **OK** to enter the first Settings screen:

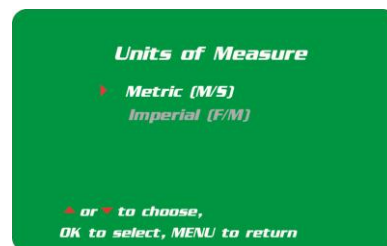


Display Options

Units of Measure

Note: The Units of Measure refers to the display of airflow velocities if the cabinet is equipped with the optional airflow sensor.

Using the ▲ and ▼ buttons on the touchpad, highlight the *Units of Measure* option-it will turn white when selected, and then press **OK**. Using the ▲ and ▼ buttons on the touchpad, highlight either *metric* or *imperial* units of measure-it will turn white when selected, and then press **OK**. The screen will then return to the first Settings screen.



Chapter 5: Using The Cabinet

Startup tone

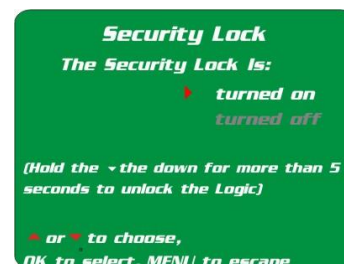
Using the ▲ and ▼ buttons on the touchpad, highlight the *Startup Tone* option-it will turn white when selected, and then press **OK**. Using the ▲ and ▼ buttons on the touchpad, highlight either *Turned on* or *Turned off* option. When turned on, an audible beep will sound during the first 90 seconds of blower operation to caution the user that the unit is not yet ready for use.



Security Lock

The Security Lock “locks” the keypad to prevent unauthorized use of the cabinet when it is not in use.

Note: The Security Lock feature only works when all Smart-Start and Night-Smart options are turned off. When selected, the security lock “locks” the keypad immediately if the blower is off, or after the blower is turned off. The security lock is deactivated by holding the ▼ button for three to five seconds. The lock must be turned on again after each deactivation.



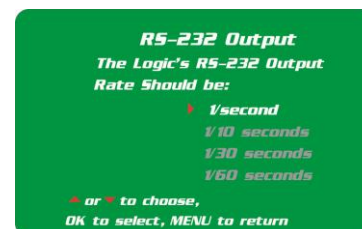
From the Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *Security Lock* option-it will turn white when selected. Press **OK** to enter the Security Lock screen. Using the ▲ and ▼ buttons on the touchpad, highlight either *turned on* or *turned off*-it will turn white when selected, press **OK**. The screen will then return to the first Settings screen.

RS-232 Output Rate

Note: This selection will only work if the optional EN/RS-232 board is installed.

This menu option selects the rate that the RS-232 board outputs data. Data can be output at a rate of once per second, once every 10 seconds, once every 30 seconds, or once per minute.

From the Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *RS-232 output*-it will turn white when selected. Press **OK** to enter the RS-232 output screen. Using the ▲ and ▼ buttons on the touchpad, highlight either the data output rate preferred. It will turn white when selected, and then press **OK**. The screen will then return to the first Settings screen.



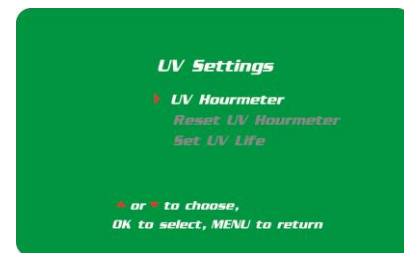
UV Settings

For models equipped with the optional UV light the Logic+ has an integral UV light maintenance system. It allows you to define how many hours you want the UV lamp to operate before receiving a reminder to replace it, a way to monitor how many hours the lamp has been on, and the means to reset the UV lamp hourmeter.

UV Lamp Hourmeter

This display only shows how many hours the UV lamp has been lit, and how many hours remain until you will receive a warning to replace the lamp.

From the Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *UV Settings* option-it will turn white when selected. Press **OK** to enter the UV Settings screen. Using the ▲ and ▼ buttons on the touchpad, highlight UV Hourmeter-it will turn white when selected, and then press **OK**. The screen will then return to the UV Hourmeter screen.



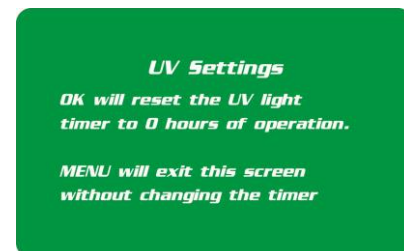
This screen displays how many hours the UV lamp has operated, and how many hours of operation remain before replacement is recommended. When finished with this screen, press **MENU** to return to the first UV Settings screen.



Reset UV Lamp Hourmeter

This option lets you reset the UV hourmeter to 0 hours whenever the lamp has been replaced.

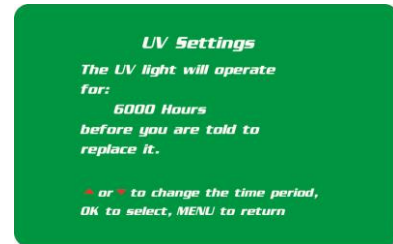
This screen allows you to reset the UV Hourmeter to 0 hours if you press **OK**. Pressing **MENU** will return you to the first UV Settings screen without resetting the hourmeter.



Change UV Lamp Life

In this screen, you can set the number of operating hours before receiving the replace UV lamp warning. For most UV lamps, the output of UV light decreases at a constant rate. Typically, after 6,000 hours of operation the lamp will output 80% of the UV light it did when it was new. This option allows you to set operational life of the UV lamp, in 100 hour increments.

From the UV Settings menu screen, use the ▲ and ▼ buttons on the touchpad to highlight the *Set UV Life* option—it will turn white when selected. Press **OK** to enter the Set UV life screen. Use the ▲ and ▼ buttons to increase or decrease the lamp life in 100 hour increments, until the desired value is displayed, and then press **OK**. The screen will then return to the UV Settings screen.



The Service Menu Screens

Note: The Service Menu screens are reserved for use by trained certification personnel as part of the certification or service procedures. All of the screens have a yellow background, and those portions of the Service Menu screens that can alter the performance of the Logic+ are password protected. If you have any questions about these screens, contact Labconco's Product Service Department at 1-800-821-5525 or www.labconco.com for assistance.

Timer Operation

NOTE: The timer button allows activation of an interval (countdown) or stopwatch (elapsed) timer. The timers cannot be operated simultaneously.

To access the main timer menu, press the *Timer* button anytime during normal operation. The main timer menu is shown on the LCD display. Use the ▲ and ▼ buttons to highlight the *Interval* or *Stopwatch* Timer. Press the *OK* button to select the highlighted timer function.

Interval Timer Operation

1. When selected, the Interval Timer menu is displayed on the LCD. The timer defaults to 0:00:00 (hours:minutes:seconds).
2. Press and hold the ▲ or ▼ buttons to increase or decrease the timer interval.
3. When the proper interval is entered on the display, press the *OK* button to start the timer.
4. When the timer reaches 0:00:00, an audible alarm will sound, and the timer will reset itself and repeat the countdown.
5. Press the *OK* button to pause the timer.
6. Press the *Menu* button to clear the interval timer and return to the main timer menu.

Stopwatch Timer Operation

1. When selected, the Stopwatch Timer menu is displayed on the LCD. The timer defaults to 0:00:00.
2. Press the *OK* button to start the timer.
3. Press the *OK* button again to zero the timer.
4. Press the *Menu* button to clear the stopwatch timer and return to the main timer menu.

If An Airflow Alert Activates

The most common causes of an Airflow Alert are:

- Blockage of the inlet grilles or exhaust outlet.
- Removal of the work surface or grille during operation.

Resetting the Airflow Alert System

The Airflow Alert automatically resets to normal operation once the motor speed has stabilized.

Working In the Biosafety Cabinet

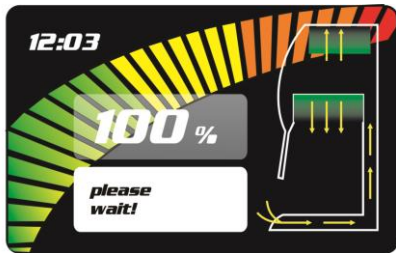
Note: A more thorough review of using the BSC can be found in: *Biosafety in Microbiological and Biomedical Laboratories (BMBL)*, Published by the Centers for Disease Control and Prevention (www.cdc.gov/biosafety/publications).

Planning

- Thoroughly understand procedures and equipment required before beginning work.
- Arrange for minimal disruptions, such as room traffic or entry into the room while the cabinet is in use.

Start-up

- Turn off UV light if included.
- Slowly raise the sash until the bottom of the sash aligns with the sash indicator decal located on the left side of the work area.
- Turn on the fluorescent light and cabinet blower if the Smart-Start features have not been activated.
- Check the air grilles for obstructions.
- Allow the cabinet to operate until the display screen is shown.



Warming up Screen



Display Screen

- Wash hands and arms thoroughly with germicidal soap.
- Wear appropriate personnel protective equipment (PPE).

Wipe-Down

- Raise the sash to its full open position (approximately 21.75 inches or 552 mm). Mute the alarm by depressing the "OK/Mute" switch.
- Wipe down the interior surfaces of the cabinet with 70% ethanol, or a suitable disinfectant, and allow to dry.

Loading Materials and Equipment

- Only load the materials required for the procedure. Do not overload the cabinet.
- Do not obstruct the front, side, or rear return air grilles.
- Large objects should not be placed close together.
- Slowly close the sash until it is in the correct operating position.
- After loading the cabinet, wait two to three minutes to purge airborne contaminants from the work area.

Work Techniques

- Keep all materials at least 4 inches (100 mm) inside from the sash, and perform all contaminated operations as far to the rear of the work area as possible.
- Segregate all clean and contaminated materials in the work area.
- Arrange materials to minimize the movement of contaminated materials into clean areas.
- Keep all discarded contaminated material to the rear of the work area.
- Avoid moving materials or the operator's hands and arms through the front access opening during use.
- Avoid the use of an open flame. Use disposable labware or an electric incinerator as alternatives.
- Use proper aseptic technique.
- Avoid using techniques or procedures that disrupt the airflow patterns of the cabinet.
- If there is a spill or splatter during use, all objects in the cabinet should be surface decontaminated before removal. Thoroughly disinfect the working area of the cabinet WHILE IT IS STILL IN OPERATION, to prevent the release of contaminants from the cabinet.

Final Purging

- Upon completion of work, the cabinet should be allowed to operate for two to three minutes undisturbed, to purge airborne contaminants from the work area.

Chapter 5: Using The Cabinet

Unloading Materials and Equipment

- Objects in contact with contaminated material should be surface decontaminated before removal from the cabinet.
- All open trays or containers should be covered before being removed from the cabinet.

Wipe-Down

- Wipe down the interior surfaces of the cabinet with a suitable disinfectant, or 70% ethanol, and allow to dry.
- Periodically lift the work surface and wipe down the area beneath it.
- Inspect and clean the towel catch located at the rear of the work area, beneath the work pan.
- Dispose of rubber gloves appropriately, and have lab coat laundered properly.
- Wash hands and arms thoroughly with germicidal soap.

Shutdown

- Lower the sash to turn off the fluorescent light and cabinet blower and activate the UV light if appropriate.

Chapter 6: Maintaining the Cabinet

The common service operations necessary to maintain the biosafety cabinet for peak performance are listed below.

Note: This manual covers operation and maintenance operations for the owners/users of the Logic+ biosafety cabinets. Complete certification procedures, service operations and specifications are published in a separate publication *Technical Manual: Purifier® Logic®+ Biosafety Cabinets*. This manual is available from Labconco's website: www.labconco.com. A complete certifier service kit is available to qualified certifiers from Labconco. Call Labconco's Product Service Department at 800-821-5525 or 816-333-8811.



Do NOT contact blower wheel while still in motion.

NE PAS être en contact avec la roué du ventilateur tant qu'il est en marche.

Routine Maintenance Schedule

Weekly

- Wipe down the interior surfaces of the cabinet with a suitable disinfectant, or 70% ethanol, and allow to dry.
- Using an appropriate glass cleaner, or LabSolutions™ Glass & Surface Wipes, Labconco part # 1570000; clean the sash and the surface of the UV lamp, if so equipped.
- Operate the cabinet blower, noting the percent filter life remaining in an operational log.

Monthly (or more often as required)

- Using a damp cloth, or LabSolutions Glass & Surface Wipes, Labconco part # 1570000; clean the exterior surfaces of the cabinet,

Chapter 6: Maintaining The Cabinet

particularly the front and top of the cabinet, to remove any accumulated dust.

- Disinfect and lift the work surface. Surface disinfect the area beneath the work surface with a suitable disinfectant, or 70% ethanol, and allow to dry. Check the towel catch for retained materials.
- Check all service valves, if so equipped, for proper operation.
- Check the UV light hourmeter, and record its reading in an operational log.
- All weekly activities.

Semiannually or Annually

- Have the cabinet re-certified by a qualified certification technician.
- All monthly activities.

Service Operations

Work Surface Removal:

Note: The work surface must be thoroughly decontaminated before removing it from the cabinet.

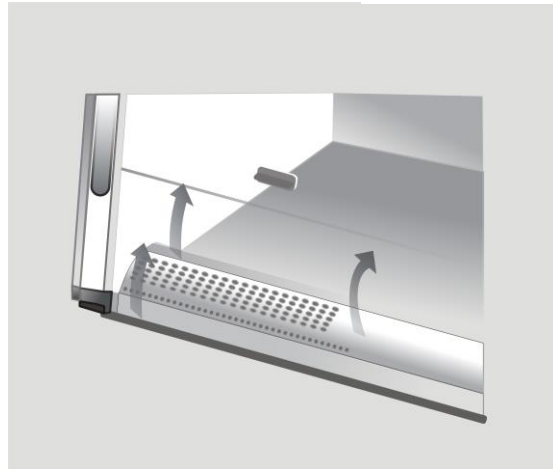
1. Lift the front edge of the work surface straight up by grasping the knob handles at either front corner.
2. Pull the work surface straight out, letting its rear edge rest on the center support underneath.
3. Reinstall the work surface by resting the bottom on the center rail while pushing it back into the cabinet. Be sure to engage the tabs on the back corners of the work surface with the slots on the rear wall of the work area.

Front Grille Removal:

Note: The grille must be thoroughly decontaminated before removing it.

1. Remove the work surface as described earlier.
2. At one end of the grille, grip the front of grille with one hand, and the back with the other hand. Pivot that end of the grille upward and inward, paralleling the angle of the sash, as shown in Figure 6-1.
3. Pull the other end of the grille up and away from the bottom edge of the cabinet.

4. Reinstall the grille by reversing the above sequence, ensuring that the grille properly engages the bottom edge of the cabinet.

Figure 6-1**Towel Catch Removal:**

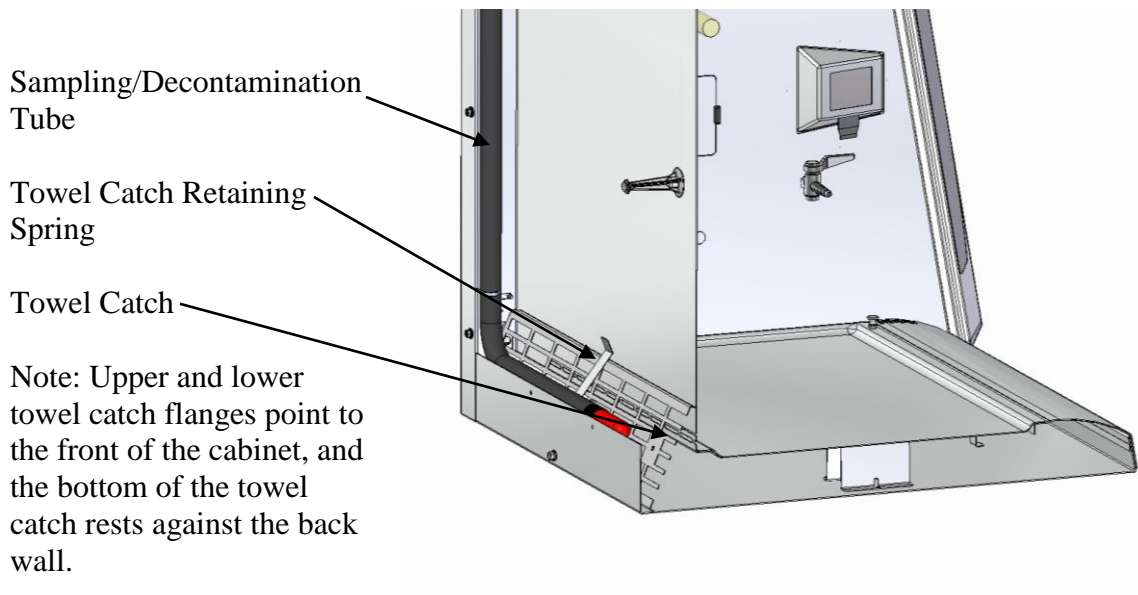
Although not normally required, the towel catch can be removed for cleaning, inspection, etc.

Note: The work surface of the cabinet and the towel catch must be thoroughly decontaminated before removing either.

1. Remove the work surface as described above.
2. Remove the towel catch by pivoting the bottom out toward you, as shown in Figure 6-2; it is spring loaded, and you will feel some resistance. Note the orientation of the towel catch.
3. Surface decontaminate the towel catch before removing it.
4. Reinstall the towel catch by sliding it back into position, in the correct orientation. Also ensure that the Sampling/Decontamination Tube (the black tube with an orange cap) rests behind the towel catch, allowing the catch to contact the rear wall of the cabinet.

Chapter 6: Maintaining The Cabinet

Figure 6-2



Font Panel Removal and Installation:

Figure 6-3

1. Locate and remove the two Phillips screws that secure the front panel as shown in Figure 6-3. They are located on the bottom corners of the front dress panel.
2. Swing the bottom of the dress panel out to clear the fluorescent light and then lift the front dress panel straight up and away from the cabinet.

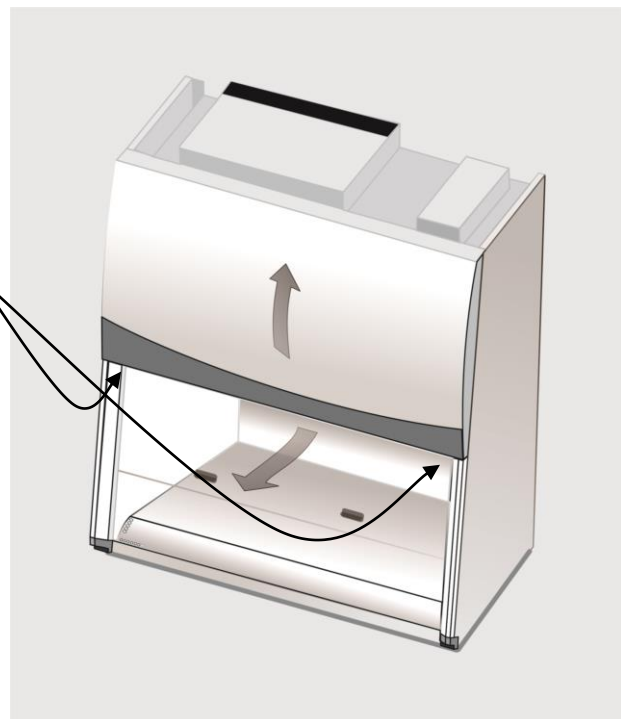


Figure 6-4

1. To reinstall the panel, reverse these steps, ensuring that the plastic pin in the top corners of the dress panel properly engage the corner posts.



Changing the Fluorescent Lamps:

1. Unplug the cabinet or turn off the System Reset Switch located on the top of the cabinet.
2. Remove the front dress panel as noted in Figure 6-3.
3. Remove the fluorescent lamps by pulling the lamp sockets straight off each end of the lamp, and releasing both lamps from the spring clips that secure them in place.
4. Install the new lamps by reversing the removal procedure.

Changing the Optional UV Lamp:

Note: For optimum performance, the UV lamp should be changed on an annual basis, or as indicated by the UV lamp timer.

The UV lamp and the work area of the cabinet must be thoroughly decontaminated before removing the lamp.

1. Start the cabinet and let it operate for 5 minutes.
2. Raise the sash to its full open position.
3. Thoroughly surface decontaminate the UV lamp and the work area of the cabinet.

Chapter 6: Maintaining The Cabinet

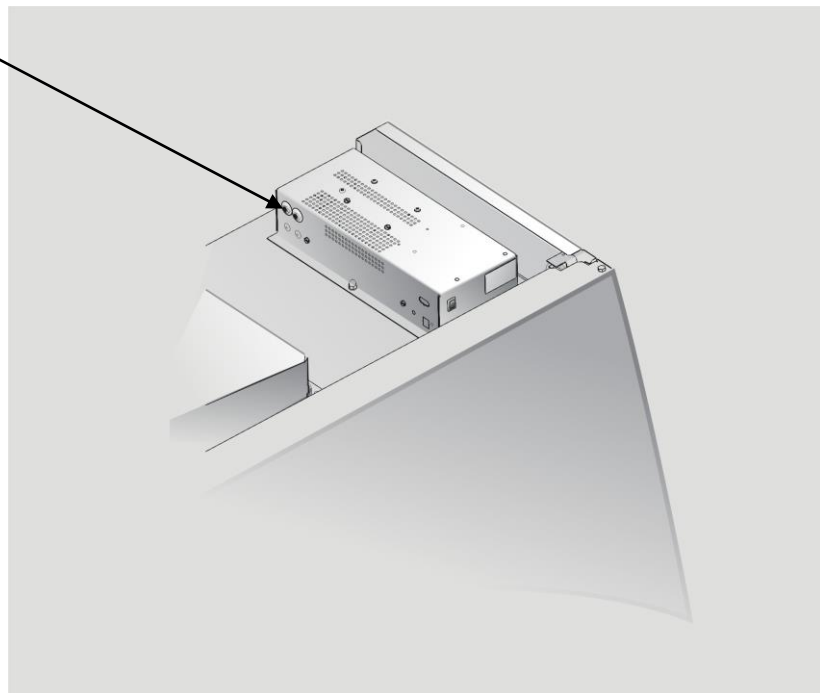
4. Unplug the cabinet or turn off the System Reset Switch, located on the top of the cabinet.
5. Remove the UV lamp by rotating it 90 degrees and lifting it straight up and out of its sockets.
6. Install new lamp by reversing the removal procedure.

Resetting a Circuit Breaker:

To reset any of the circuit breakers located on the left side of the electronics module, depress the white button until it sets.

Figure 6-5

Circuit Breakers- The front breaker protects the electrical outlets, the rear breaker protects the motor and lights.



Storage

If the biosafety cabinet is to be left unused for more than one month, it should be prepared for storage.

Note: The cabinet should not be stored in areas of excess humidity or temperature extremes. If the cabinet is moved during storage, it must be recertified before use.

1. Close the sash completely and seal the bottom edge and the exhaust outlet with plastic sheeting.
2. Unplug the cabinet.
3. Ensure that the cabinet will not be moved or disturbed while being stored.

Chapter 7: Troubleshooting

Refer to the following table if the biosafety cabinet fails to operate properly. If the suggested corrective actions do not solve the problem, contact Labconco for additional assistance.

PROBLEM	CAUSE	CORRECTIVE ACTION
Cabinet blower and lights won't turn on	Unit not plugged into outlet	Plug the biosafety cabinet into appropriate electrical service. Check connection to control box on top of cabinet.
	System Reset Switch is Off	Turn on the System Reset Switch.
	Circuit breaker(s) tripped	Reset circuit breakers.
	Keypad disconnected or defective	Run keypad diagnostics and check connections.
Blower won't turn on	Sash closed	Raise sash.
	Keypad disconnected or defective	Run keypad diagnostics and check connections.
	Blower wiring is disconnected	Inspect blower wiring.
	Blower motor is defective	Replace blower motor.

Chapter 7: Troubleshooting

PROBLEM	CAUSE	CORRECTIVE ACTION
Fluorescent light not working	Sash is closed	Open sash – Fluorescent lights will not work with the sash closed.
	Lamp(s) are defective	Replace defective lamp(s)
	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballasts	Replace lamp ballasts.
Fluorescent light is dim or flickering	Keypad disconnected or defective	Run keypad diagnostics and check connections.
	Lamp(s) are defective	Replace defective lamp(s)
	Lamp wiring is disconnected	Inspect lamp wiring.
UV light not working	Defective lamp ballast	Replace lamp ballast.
	Sash is open	Close sash – UV light will not work with the sash open.
	Lamp is defective	Replace defective lamp.
UV light not working	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballast	Replace lamp ballast.
	Keypad disconnected or defective	Run keypad diagnostics and check connections.
	Lamp is defective or is at end of operating lifetime.	Replace defective or worn out lamp.
UV light is dim or flickering	Lamp wiring is disconnected	Inspect lamp wiring.
	Defective lamp ballast	Replace lamp ballast.

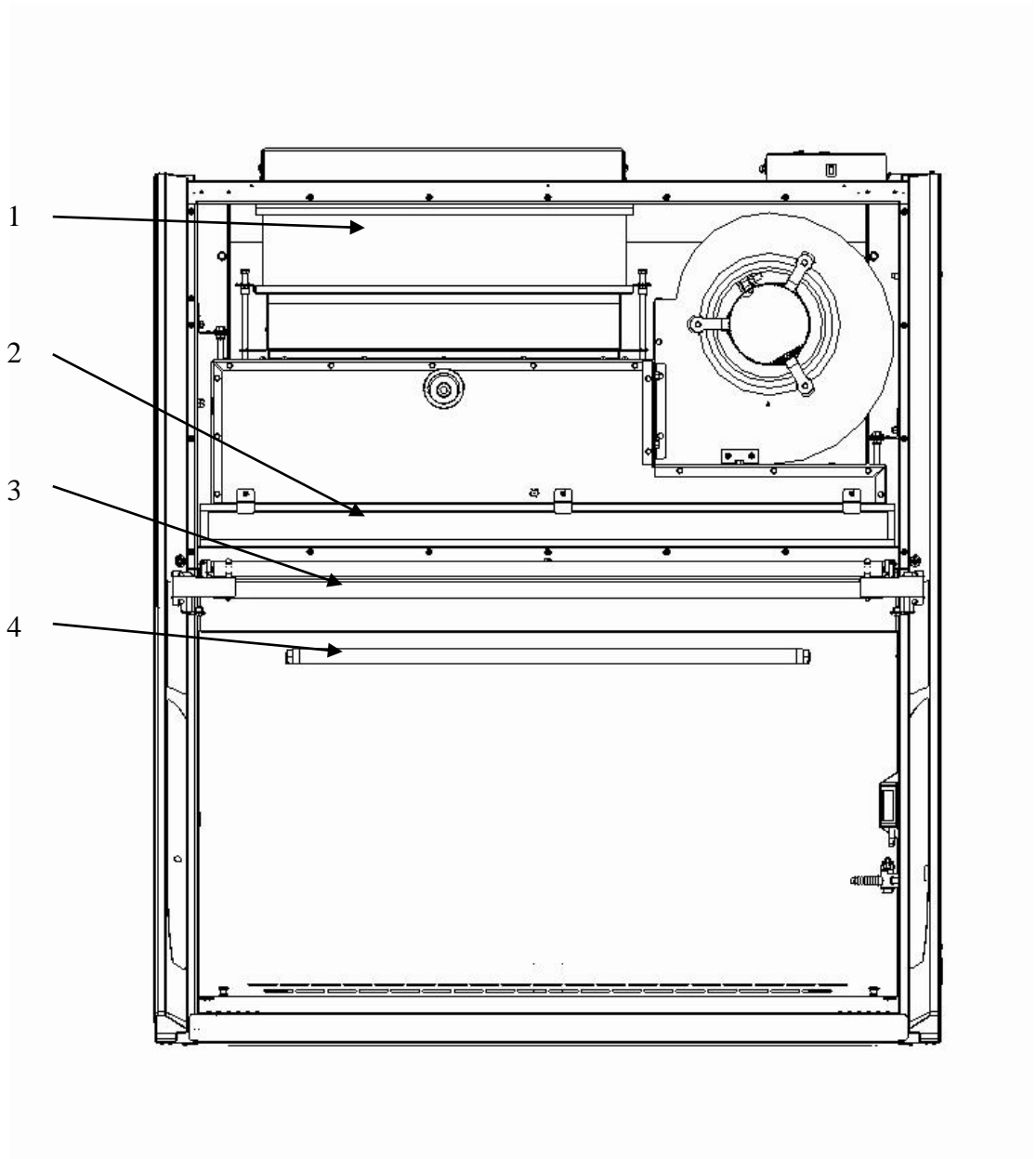
PROBLEM	CAUSE	CORRECTIVE ACTION
Airflow Alert goes off and/or there is a slight decrease in filter life remaining gauge	HEPA filter loading	The gauge reading steadily decreases as the cabinet is used.
	Blockage of the return air slots or grille	Check all return air slots and grilles to ensure that they are not blocked or restricted.
	Blockage of the exhaust outlet	Ensure that the exhaust outlet is not blocked or restricted.
Contamination of work in the cabinet	Blockage or restriction under the work surface	Ensure that the towel catch and plenum beneath the work surface are unobstructed.
	Improper technique or procedure for the biosafety cabinet	See “Use of the cabinet” section in the manual.
	Restriction of the return air slots or grille – blockage of the exhaust outlet	Ensure that all return air slots, grilles and the exhaust outlet are unobstructed.
	External factors are disrupting the cabinet airflow patterns or acting as a source of contamination	See “Working in the Biosafety Cabinet” section of this manual.
	Cabinet is out of adjustment/HEPA filter(s) are defective	Have cabinet recertified.

Appendix A: Components

Illustration A-1 indicates the location of the following service parts, and replacement accessory parts:

Biosafety Cabinet Replacement Parts

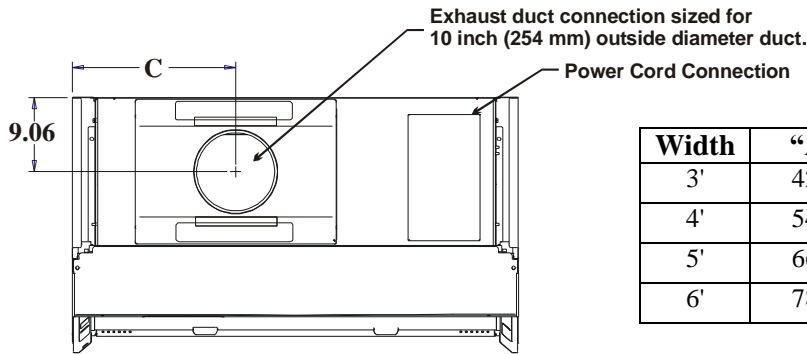
Item	Quantity	Part No.	Description
1	1	3838500	Exhaust HEPA Filter 3-ft
1A	1	3838501	Exhaust HEPA Filter 4-ft
1B	1	3838502	Exhaust HEPA Filter 5-ft
1C	1	3838503	Exhaust HEPA Filter 6-ft
2	1	3838400	Supply HEPA Filter 3-ft
2A	1	3838401	Supply HEPA Filter 4-ft
2B	1	3838402	Supply HEPA Filter 5-ft
2C	1	3838403	Supply HEPA Filter 6-ft
3	2	9721901	Lamp, Fluorescent, 3-ft
3A	2	9721900	Lamp, Fluorescent, 4-ft
3B	2	9721903	Lamp, Fluorescent, 5- & 6-ft
4	1	1271300	Lamp, UV (models with UV light only)



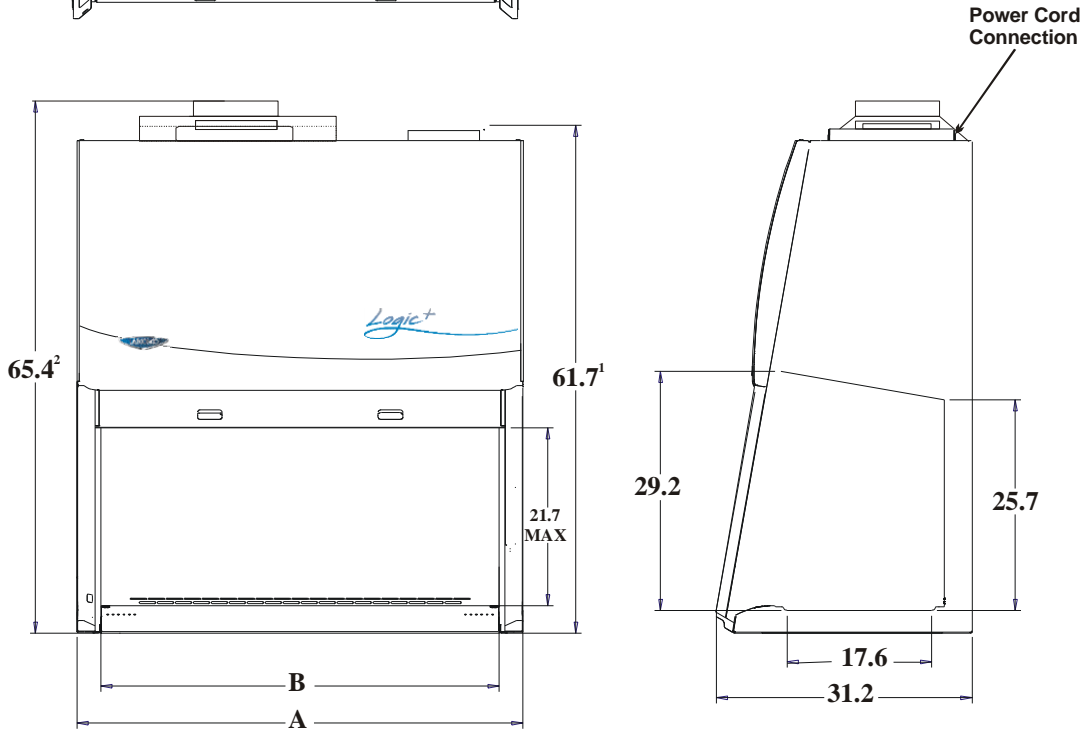
Appendix B: Dimensions

All dimensions in inches.

B-1



Width	"A"	"B"	"C"
3'	42.3	36.5	13.6
4'	54.3	48.5	19.9
5'	66.3	60.5	26.9
6'	78.3	72.5	32.9



- 1 - Overall height with standard exhaust cover.
- 2 - Overall height with Ventus canopy connection.
Exhaust collar is 2 inches (50 mm) high.

Appendix C: Specifications

Electrical Data

Model #	Requirements
3023xxx0x	115 VAC, 60 Hz, 12 Amps
3023xxx1x	100 VAC, 50/60 Hz, 12 Amps
3023xxx-20, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 6 Amps
3024xxx0x	115 VAC, 60 Hz, 12 Amps
3024xxx1x	100 VAC, 50/60 Hz, 12 Amps
3024xxx-20, 30, 40, 50, 60, 70, 80	230 VAC, 50/60 Hz, 6 Amps
3025xxx0x	115 VAC, 60 Hz, 16 Amps
3025xxx1x	100 VAC, 50/60 Hz, 16 Amps
3025xxx-20, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps
3026xxx0x	115 VAC, 60 Hz, 16 Amps
3026xxx1x	100 VAC, 50/60 Hz, 16 Amps
3026xxx-20, 30, 40, 50, 60, 70	230 VAC, 50/60 Hz, 8 Amps

Motor Specifications

Cabinet Model	Electrical Requirements
All 3- and 4-foot Cabinets, all Voltages	1/2 H.P. Electronically Commutated Motor (ECM) 120-277 VAC – 50/60 Hz, Full Torque – 42 Oz.-Ft (3.56 N-M) 7.7 Full Load Amps @115VAC 4.3 Full Load Amps @230VAC Automatic Thermal Protection

Cabinet Model	Electrical Requirements
All 5- and 6-foot Cabinets, all Voltages	3/4 H.P. Electronically Commutated Motor 120-277 VAC – 50/60 Hz, Full Torque – 66 Oz.-Ft (5.59 N-M) 9.6 Full Load Amps @115VAC 6.8 Full Load Amps @230VAC Automatic Thermal Protection

Appendix C: Specifications

Environmental Conditions

- Indoor use only.
- Ambient temperature range: 41° to 104°F (5° to 40°C).
- Maximum relative humidity: 80% for temperatures up to 88°F (31°C), decreasing linearly to 50% relative humidity at 104°F (40°C).
- Main supply voltage fluctuations not to exceed $\pm 10\%$ of the nominal voltage.
- Transient overvoltages according to Installation Categories II (Overvoltage Categories per IEC 1010). Temporary voltage spikes on the AC input line that may be as high as 1500V for 115V models and 2500V for 230V models are allowed.
- Used in an environment of Pollution degrees 2 (i.e., where normally only non-conductive atmospheres are present). Occasionally, however, a temporary conductivity caused by condensation must be expected, in accordance with IEC 664.

Appendix D: Accessories

Labconco offers a full line of accessories to enhance your Logic+'s operation and usability. For a complete list of these accessories, please consult our website at www.labconco.com .

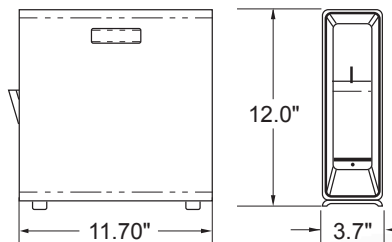
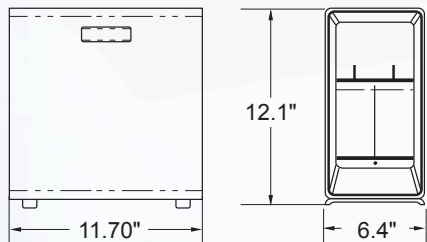
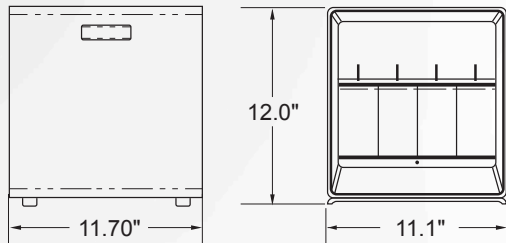
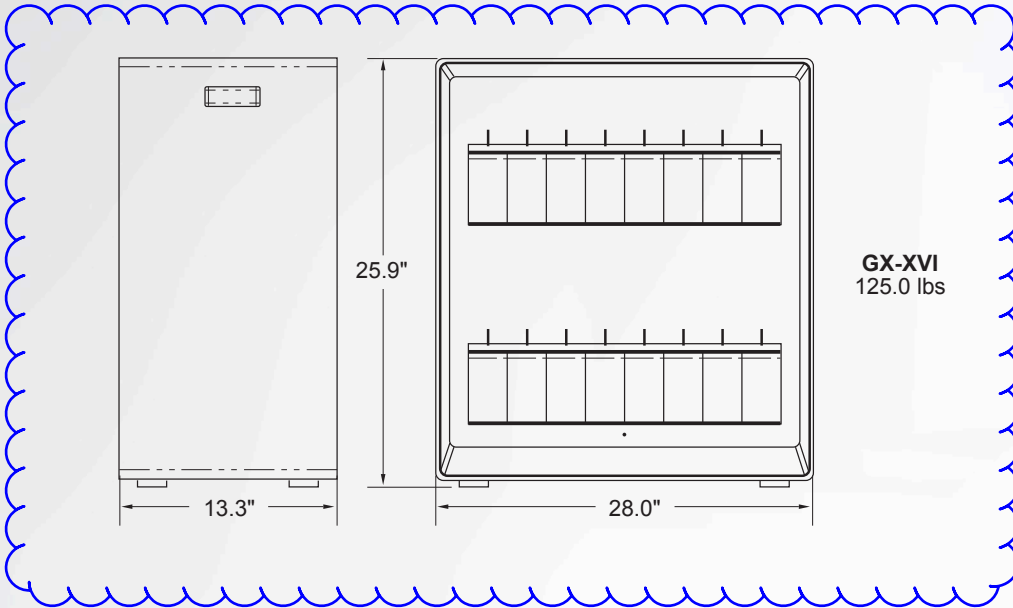
Appendix E: Quick Chart

Model	30231_	30238_	30241_	30248_	30248xx80	30251_	30258_	30261_	30268_
Type	A2	A2	A2	A2	A2	A2	A2	A2	A2
Cabinet Size (in feet)	3	3	4	4	4	5	5	6	6
Sash Opening (inches)	10	8	10	8	8	10	8	10	8
Starting Serial # ¹	1303_	1303_	1303_	1303_	1312_	1303_	1303_	1303_	1303_
Nominal Avg. Downflow (FPM)	55+/-5	55+/-5	55+/-5	55+/-5	70+/-5	55+/-5	55+/-5	55+/-5	55+/-5
Nominal Average Inflow (FPM)	105+/-5	105+/-5	105+/-5	105+/-5	105+/-5	105+/-5	105+/-5	105+/-5	105+/-5
Supply HEPA Data									
Labconco P/N	3838400	3838400	3838401	3838401	3838401	3838402	3838402	3838403	3838403
Exhaust HEPA Data									
Labconco P/N	3838500	3838500	3838501	3838501	3838501	3838502	3838502	3838503	3838503
Motor/Blower Data									
Labconco P/N ²	3832200	3832200	3832201	3832201	3832201	3832207	3832207	3832208	3832208
Motor HP	1/2	1/2	1/2	1/2	1/2	3/4	3/4	3/4	3/4
Fluorescent/UV Lamp Data									
Fluorescent Lamps (2 each)	F25T8 TL741	F25T8 TL741	F32T8 TL741	F32T8 TL741	F32T8 TL741	F40T8 SP41	F40T8 SP41	F40T8 SP41	F40T8 SP41
UV Lamp	G30T8	G30T8	G30T8	G30T8	G30T8	G30T8	G30T8	G30T8	G30T8

1. The primary serial tag is on the lower outside edge of the right corner post. The secondary serial tag is located on the front of the electronics module on the top right side of the cabinet. The first two digits of the serial number are the year of production; the next two are the month. The next 5 digits are the sequence of production, and the letter following the serial number is the revision level of the cabinet.
2. Each motor must be programmed by Labconco for the appropriate width cabinet.



GeneXpert® System Footprints



SPACE REQUIREMENTS

	Width (in.)	Height (in.)	Depth (in.)
GeneXpert IV System (GX-IV) w/Desktop	32	20.5	19
GeneXpert IV System (GX-IV) w/Laptop	34	12	14.5
<i>System Footprint</i> GeneXpert II System (GX-II) w/Desktop	26	20.5	19
GeneXpert II System (GX-II) w/Laptop	28	12	14.5
GeneXpert XVI System (GX-XVI) w/Desktop	60	25.8	13.25
GeneXpert XVI System (GX-XVI) w/Laptop	62	25.8	8.75
UPS & battery pack	9	12	15
Printer	20	8.5	14.5
<i>Accessories</i> Desktop	13.3	3.95	15
Keyboard	17	1	5
Monitor	17	14	8

POWER REQUIREMENTS

Rated Current GX-I: 1.5A @ 100V~, 0.75 A @ 200V~

Rated Current GX-II: 1.5A @ 100V~, 0.75 A @ 200V~

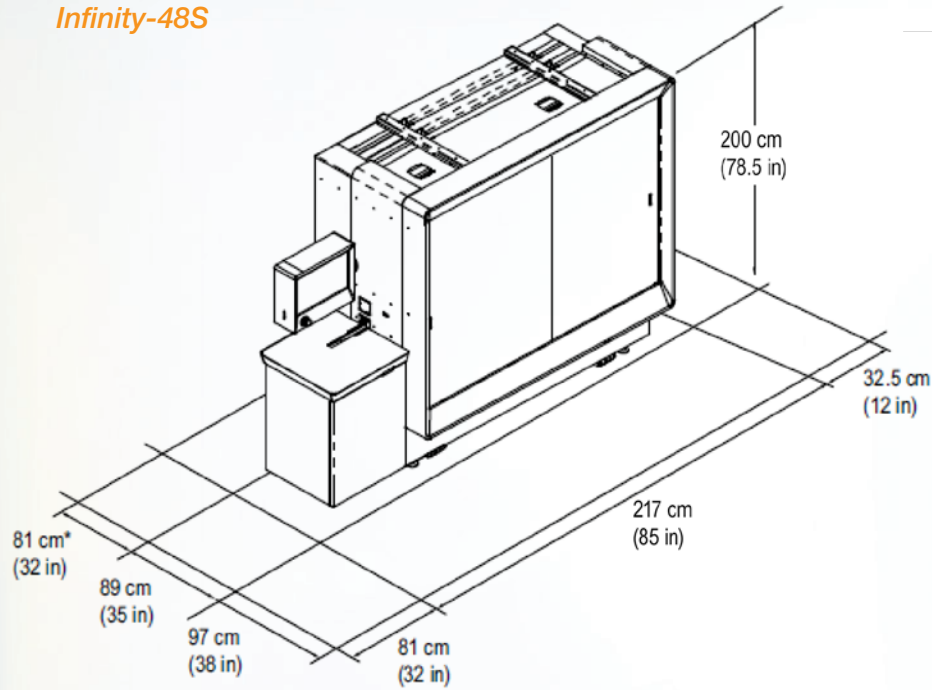
Rated Voltage: 100-240 V~, 50-60 Hz

Rated Current GX-IV: 1.4A @ 100V~, 0.95 A @ 200V~

Rated Current GX-XVI: 6.16A @ 100V~, 4.12 A @ 200V~

GeneXpert® Infinity System Footprints

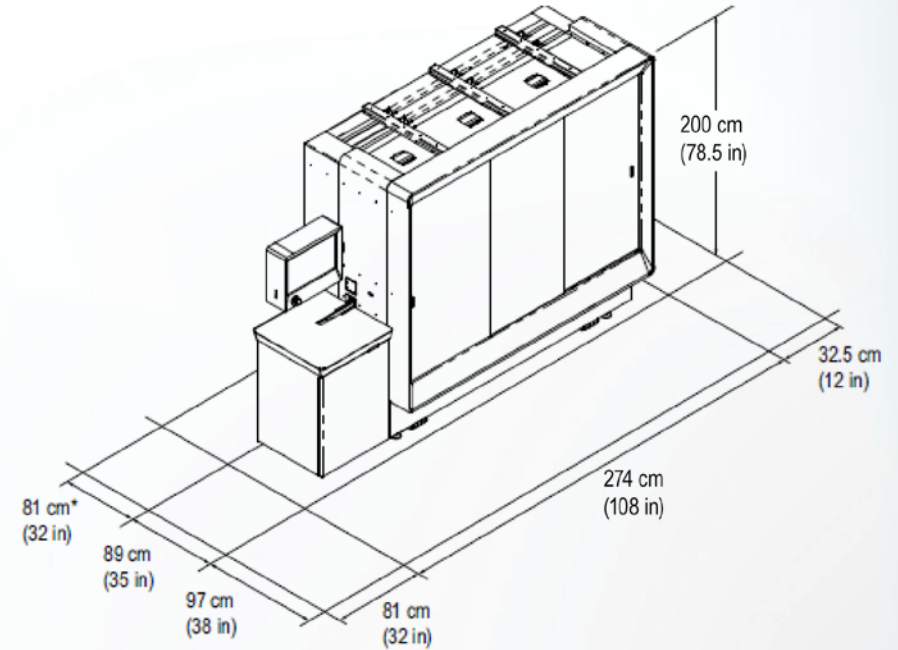
Infinity-48S



This measurement is from the back of the kiosk to the facility wall.

Instrument Weight: ~725 kg (~1600 lbs)

Infinity-80



This measurement is from the back of the kiosk to the facility wall.

Instrument Weight: ~953 kg (~2100 lbs) *Electrical plug access (bottom right-side back corner)*

ELECTRICAL REQUIREMENTS (Infinity-48s & 80)

POWER REQUIREMENTS

Line Voltage:
200 – 240 VAC, 20A

Frequency:
50 Hz – 60 Hz +/- 0.5%



One 200 to 240 VAC 20A outlet with a NEMA L6-20R receptacle required.

POWER CONSUMPTION

Max Current 16 Amps @ 200 VAC

CORPORATE HEADQUARTERS

904 Caribbean Drive
Sunnyvale, CA 94089 USA

TOLL FREE 1.888.336.2743
PHONE 1.408.541.4191
FAX 1.408.541.4192

EUROPEAN HEADQUARTERS

Vira Solelh
81470 Maurens-Scopont France

PHONE 33.563.82.53.00
FAX 33.563.82.53.01

www.Cepheid.com



- G1805** Eyewash, Deck Mounted AutoFlow™ 90° Swivel, Right Hand Mounting
- G1805LH** Eyewash, Deck Mounted AutoFlow™ 90° Swivel, Left Hand Mounting



Application: AutoFlow™ eyewash for mounting next to sink. Swinging the spray head assembly horizontally out over the sink activates the water flow. The unit remains in operation until the spray head assembly is swung back into the storage position, closing the valve.

Spray Head Assembly: Two GS-Plus™ spray heads. Each head has a “flip top” dust cover, internal flow control and filter to remove impurities from the water flow.

Valve: 1/2" IPS plug-type valve with Teflon® coated O-ring seals. Swinging head assembly from storage to operational position opens orifice and activates water flow. Unit remains in operation until head assembly is returned to storage position.

Strainer: Unit is furnished with in-line strainer to protect valve and spray heads from debris in water line.

Mounting: Unit may be mounted on right side (G1805) or left side (G1805LH) of sink. Furnished with mounting shank, positioning lugs, locknut and washer for securing unit to counter.

Construction: Polished chrome plated brass.

Supply: 1/2" NPT female inlet.

Sign: ANSI-compliant identification sign.

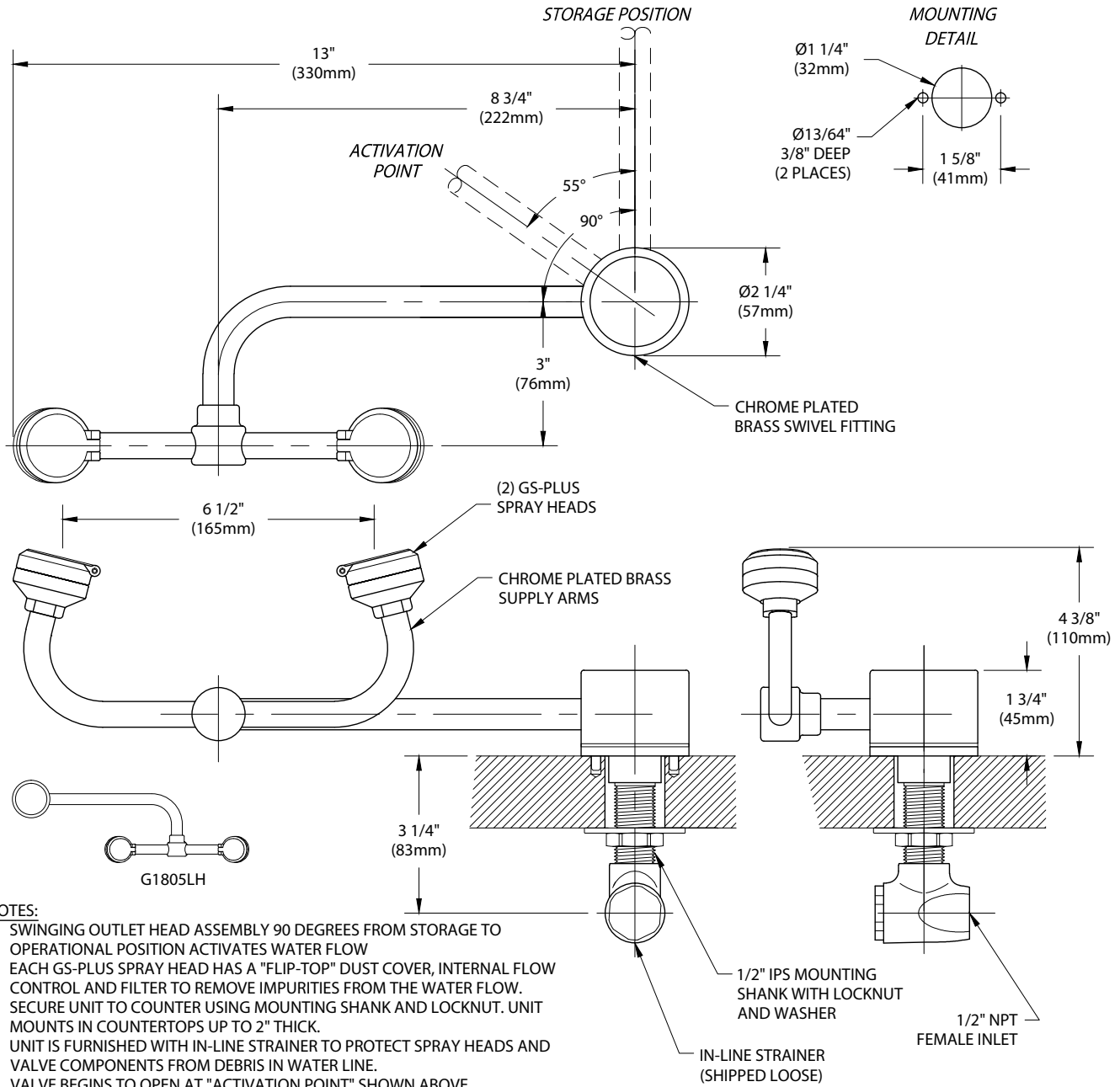
Quality Assurance: Unit is completely assembled and water tested prior to shipment.

Available Options

- DC** Stainless steel dust cover for each spray head.
- TMV** G3600LF thermostatic mixing valve precisely blends hot and cold water to deliver warm (tepid) water as required by ANSI Z358.1-2014. Refer to “Tempering Units” section for complete technical and product selection information.



- **G1805** Eyewash, Deck Mounted AutoFlow™ 90° Swivel, Right Hand Mounting
- **G1805LH** Eyewash, Deck Mounted AutoFlow™ 90° Swivel, Left Hand Mounting



NOTES:

1. SWINGING OUTLET HEAD ASSEMBLY 90 DEGREES FROM STORAGE TO OPERATIONAL POSITION ACTIVATES WATER FLOW
2. EACH GS-PLUS SPRAY HEAD HAS A "FLIP-TOP" DUST COVER, INTERNAL FLOW CONTROL AND FILTER TO REMOVE IMPURITIES FROM THE WATER FLOW.
3. SECURE UNIT TO COUNTER USING MOUNTING SHANK AND LOCKNUT. UNIT MOUNTS IN COUNTERTOPS UP TO 2" THICK.
4. UNIT IS FURNISHED WITH IN-LINE STRAINER TO PROTECT SPRAY HEADS AND VALVE COMPONENTS FROM DEBRIS IN WATER LINE.
5. VALVE BEGINS TO OPEN AT "ACTIVATION POINT" SHOWN ABOVE.

THIS SPACE FOR ARCHITECT/ENGINEER APPROVAL

Sign Included



Due to continuing product improvement, the information contained in this document is subject to change without notice. All dimensions are ± 1/4" (6mm). rev. 0215



Appendix D
HHSC Permit Exemption

9. Repairs which involve only the replacement of component parts or existing work with similar materials for the purpose of maintenance, and which do not aggregate over \$5,000 in valuation in any 12-month period, and do not affect any electrical or mechanical installations. Repairs exempt from permit requirements shall not include any additions, change or modification in construction, exit facilities, or permanent fixtures or equipment. Specifically exempted from permit requirements without limit to valuation are:

- A. Painting and decorating.
- B. Installation of floor covering.
- C. Cabinet work.
- D. Outside paving.
- E. Siding installation over existing exterior walls of buildings of Group R-3 or M Occupancy.

10. Work located in Federal property.

11. Work performed for any state governmental agency, except where permits are specifically requested by said agency.

12. Temporary tents or other covering erected for commercial, ceremonial or religious purposes, such as rallies, festivals, amusement and side shows provided no person, firm or corporation shall erect any tent or similar structure which is to be used as a dwelling. Approval for such temporary tent or other covering must be obtained from the Chief of the Fire Department and shall be limited to a period of not more than 30 consecutive days.

13. Curbs and retaining walls not over 36 inches in height and which do not obstruct an intersection pursuant to Chapter 16, Traffic Code, Kauai County Code 1987, as amended.

(9) Amending Section 302(a)6.

Section 302(a)6 is amended to read:

... authorized agent or his successor in interest, which

Appendix E

Schematic Drawings

HHSC KAUAI RENOVATIONS

KVMH COVID-19 TESTING LAB

4643 WAIMEA CANYON DRIVE
 WAIMEA, HI 96796
 TMK#: 1-2-603:5

SCHEMATIC DESIGN



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 HONOLULU, HI 96813
 808.523.5866
 WWW.G70.DESIGN

REVISIONS
 # Date Description

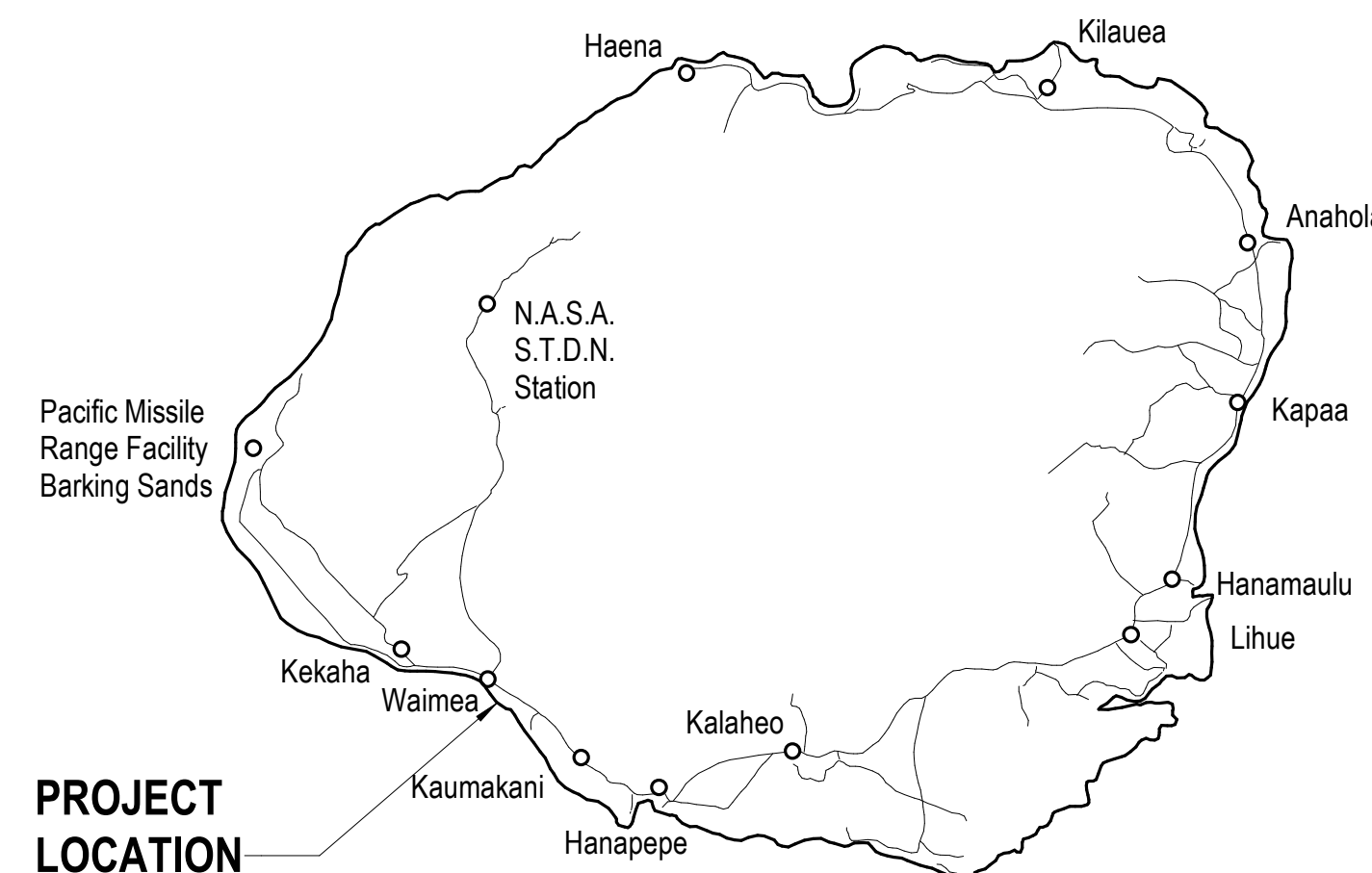
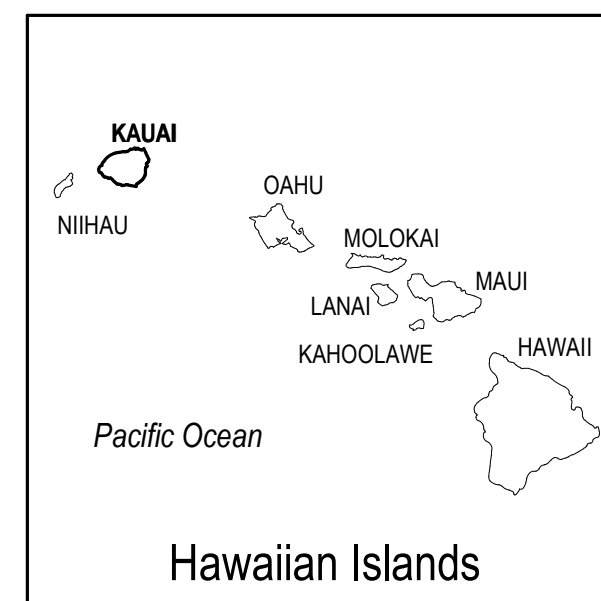
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License Expiration Date

LOCATION MAP



DRAWING NOT TO SCALE

VICINITY MAP

PROJECT TEAM

CLIENT:
 HAWAII HEALTH SYSTEMS CORPORATION - KAUAI DIVISION
 4643 Waimea Canyon Drive
 P.O Box 337
 Waimea, HI 96796

CONSULTANTS

ARCHITECT:
 GROUP 70 INTERNATIONAL, INC.
 111 South King Street, Suite 170
 Honolulu, Hawaii 96813

STRUCTURAL:
 SHIGEMURA, LAU, SAKANASHI, HIGUCHI & ASSOCIATES, INC.
 1916 Young Street, 2nd floor
 Honolulu, HI 96826

INTERIOR:
 GROUP 70 INTERNATIONAL, INC.
 111 South King Street, Suite 170
 Honolulu, Hawaii 96813

MECHANICAL:
 INSYNERGY ENGINEERING
 828 Fort Street Mall, Suite 500
 Honolulu, HI 96813

ELECTRICAL:
 INSYNERGY ENGINEERING
 828 Fort Street Mall, Suite 500
 Honolulu, HI 96813

PROJECT TITLE

HHSC KAUAI RENOVATIONS

KVMH COVID LAB

FILENAME:

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TITLE, PROJECT TEAM, PROJECT VICINITY

SCALE:

DRAWN BY:

Author

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PROJECT NO.

220038-01

DRAWING NO.

T001

SHEET ISSUE DATE:

11/30/20

TITLE

SHEET NO.	SHEET NAME
T001	TITLE, PROJECT TEAM, PROJECT VICINITY
T002	INDEX TO SHEETS
T004	ABBREVIATIONS AND ARCHITECTURAL SYMBOLS

ARCHITECTURE

SHEET NO.	SHEET NAME
A101	OVERALL FLOOR PLAN
A111	DEMO FLOOR PLAN, FLOOR PLAN AND REFLECTED CEILING PLAN
A501	INTERIOR ELEVATIONS, FINISH FLOOR PLAN AND COLOR MATERIAL FINISH SCHEDULE

MECHANICAL

SHEET NO.	SHEET NAME
M-001	MECHANICAL NOTES AND LEGEND
M-101	MECHANICAL DEMOLITION PLAN
M-201	MECHANICAL NEW WORK PLAN

PLUMBING

P-001	PLUMBING NOTES AND LEGENDS
P-101	PLUMBING DEMOLITION PLAN
P-102	PLUMBING NEW WORK PLAN

ELECTRICAL

SHEET NO	SHEET NAME
E-001	ELECTRICAL SPECIFICATIONS AND GENERAL NOTES
E-002	FIRE ALARM GENERAL NOTES
E-003	ELECTRICAL SYMBOL LIST
E-101	COVID LAB ELECTRICAL DEMO PLAN
E-102	COVID LAB ELECTRICAL PLAN
E-501	LUMINAIRE SCHEDULE



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PROJECT TITLE

**HHSC KAUAI
 RENOVATIONS**

KVMH COVID LAB

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INDEX TO SHEETS

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PROJECT NO.

220038-01

DRAWING NO.

T002

SHEET ISSUE DATE:

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ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED

Table of abbreviations for architectural symbols, including categories like AND, AT, CENTER LINE, etc., with corresponding symbols and descriptions.

SYMBOLS

Section titled 'SYMBOLS' containing various architectural symbols and their corresponding labels, such as 'View Name', 'DOOR MARK', 'WINDOW TYPE', 'PARTITION MARK', 'KEYNOTE MARK', 'REVISION', 'REVISION CLOUD', 'FINISH CEILING ELEVATION CHANGE', 'WORKING POINT CONTROL POINT OR DATUM POINT', 'WPT / CONTROL PT OR DATUM POINT', 'POINT ELEVATION', 'ELEVATION CALL OUT', 'ROOM TAG', 'AREA TAG', 'ELEVATION CHANGE', 'SLOPE', 'TYP JAMB CONDITION (UNO)', 'DIMENSIONS', 'FIRE EXTINGUISHER CABINET', 'KEY TO INTERIOR ELEVATIONS', and 'NORTH ARROW'.

G70 logo and contact information: 111 S. KING STREET, SUITE 170 HONOLULU, HI 96813 808.523.5866 WWW.G70.DESIGN

REVISIONS table with columns for #, Date, and Description. Below it, SCHEMATIC DESIGN 12/14/20. A disclaimer text block follows, stating: 'This work was prepared by me or under my supervision and construction of this project will be under my observation. Supervision and Observation of this project is as defined in Section 1.2 of the Hawaii Administrative Rules, Title 16, Chapter 115, Professional Engineers, Architects, Land Surveyors, and Landscape Architects.'

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PROJECT TITLE

HHSC KAUAI RENOVATIONS

KVMH COVID LAB

FILENAME:

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DRAWING TITLE

OVERALL FLOOR PLAN

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

DRAWN BY:

Author

CHECKED BY:

Checker

PROJECT NO.

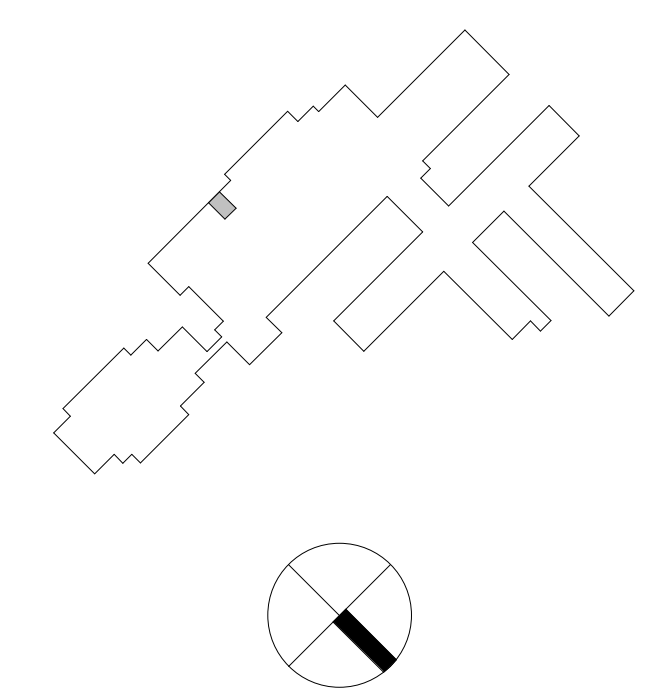
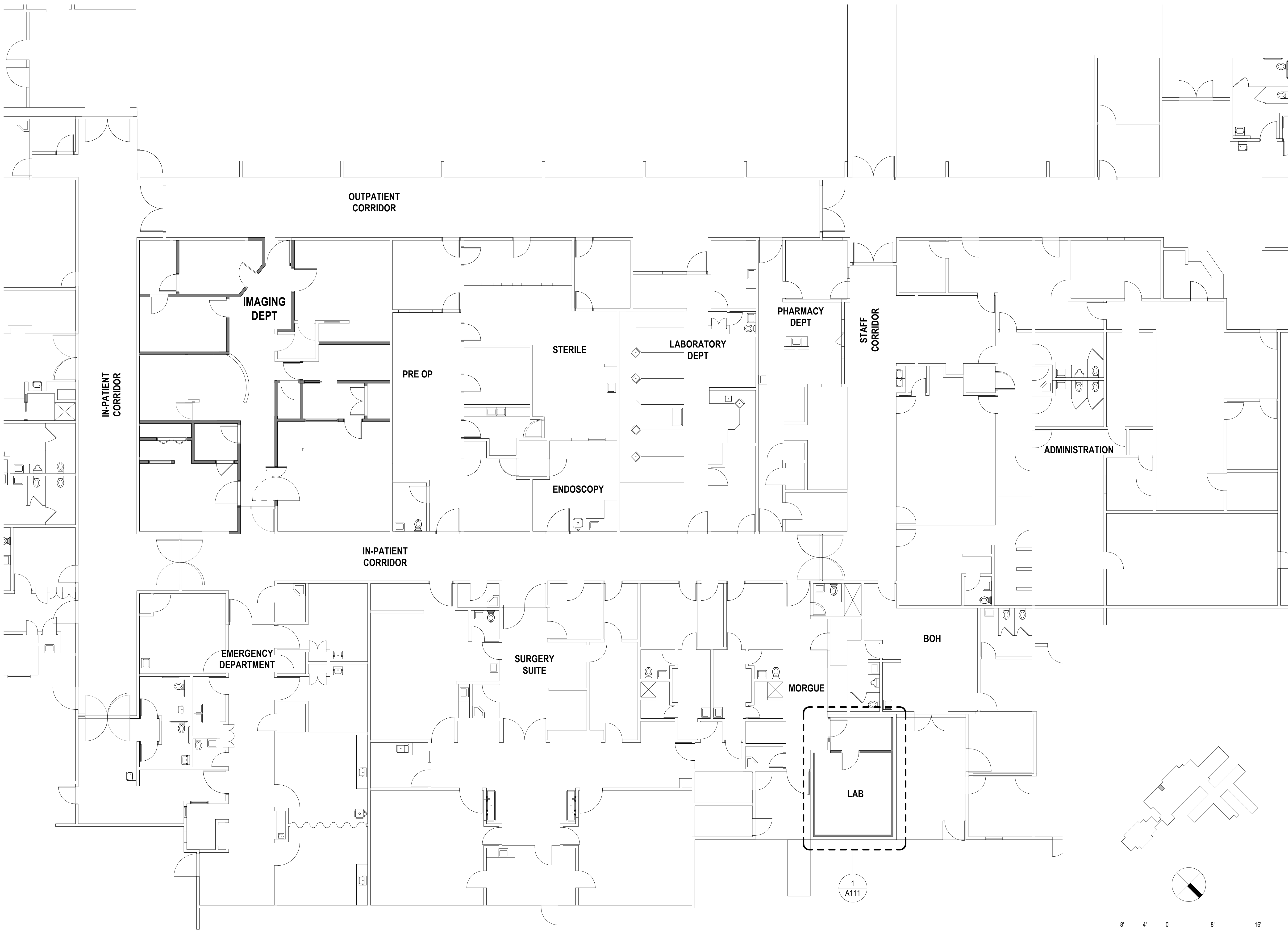
220038-01

DRAWING NO.

A101

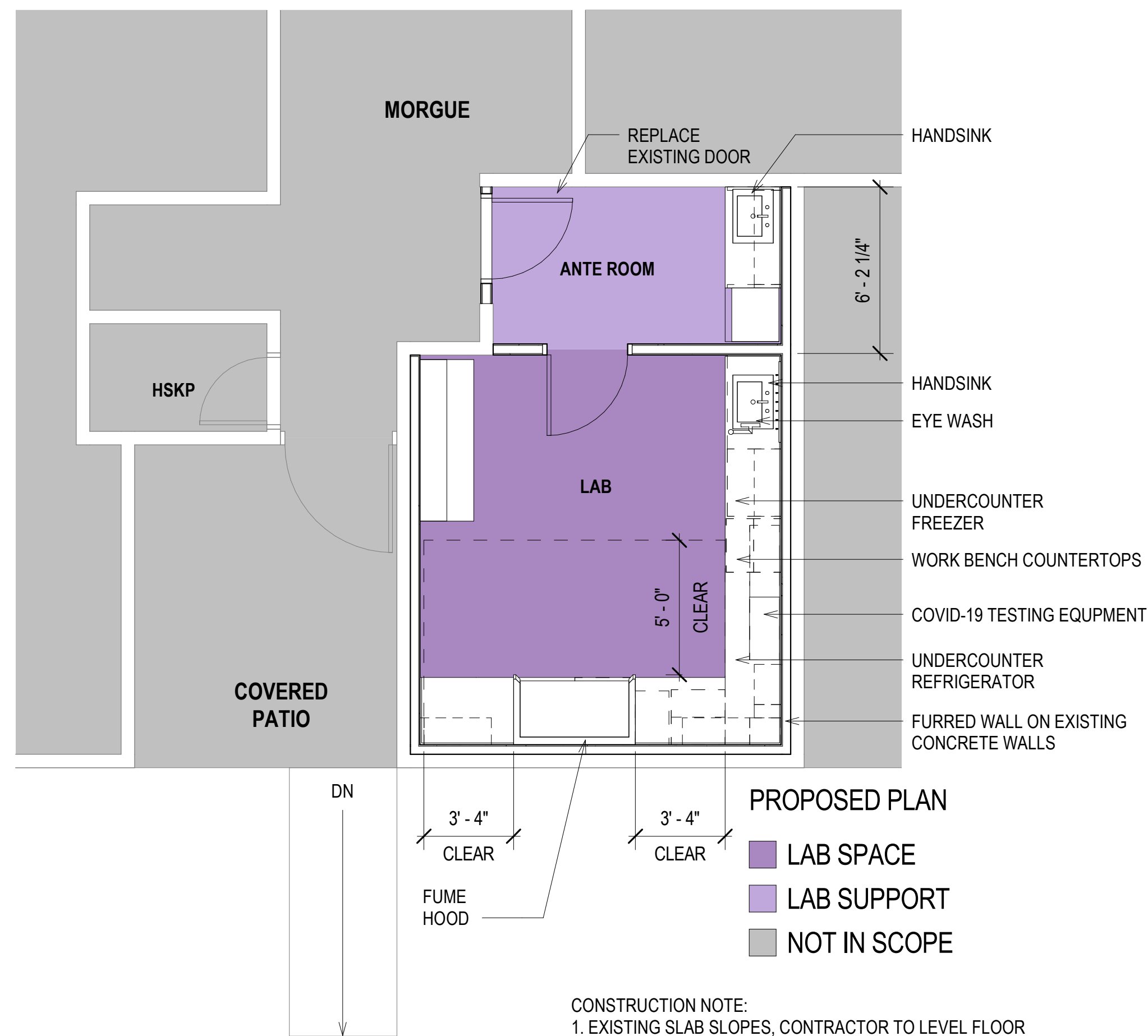
SHEET ISSUE DATE:

11/30/20

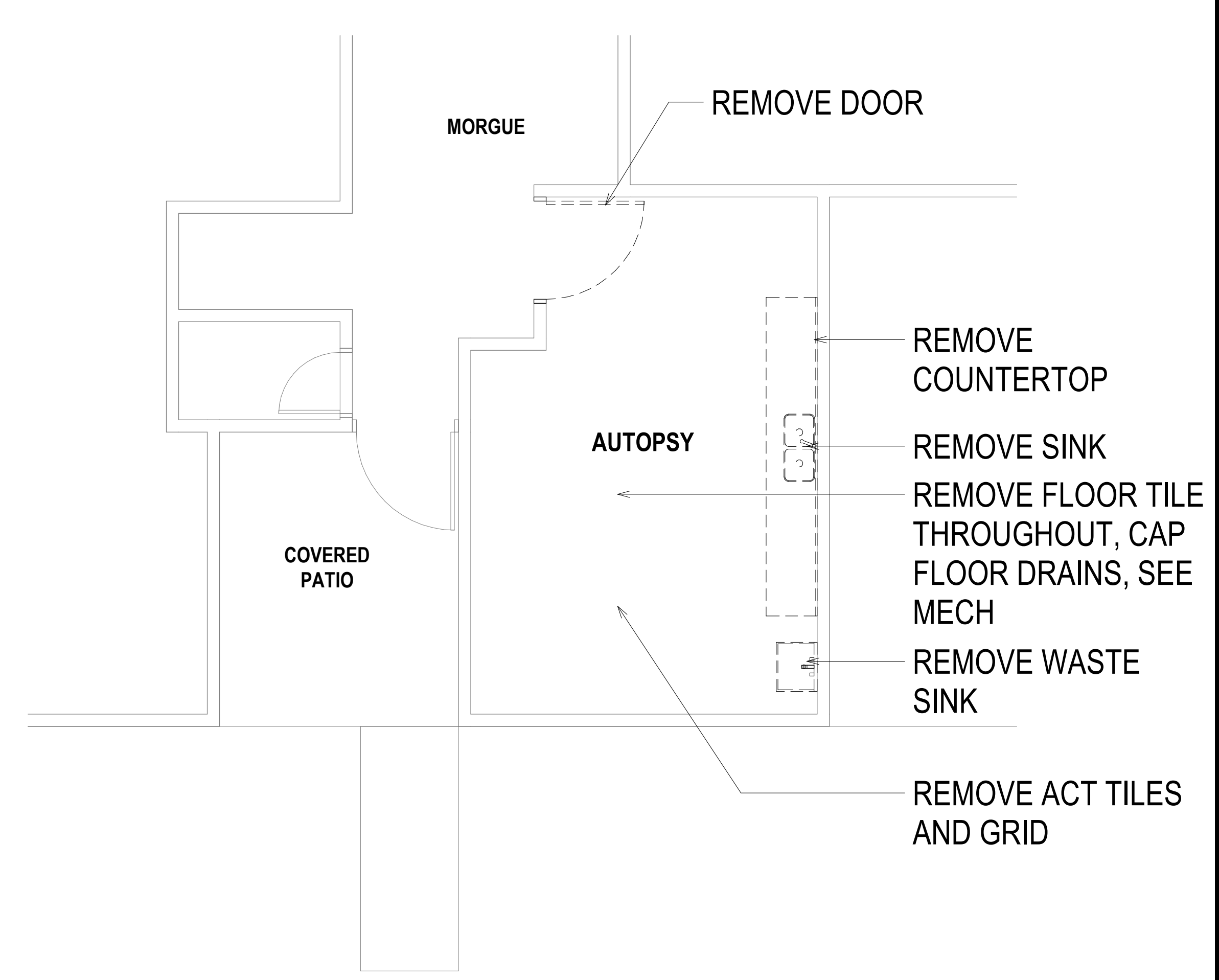


1 OVERALL PLAN
 SCALE: 1/8" = 1'-0"

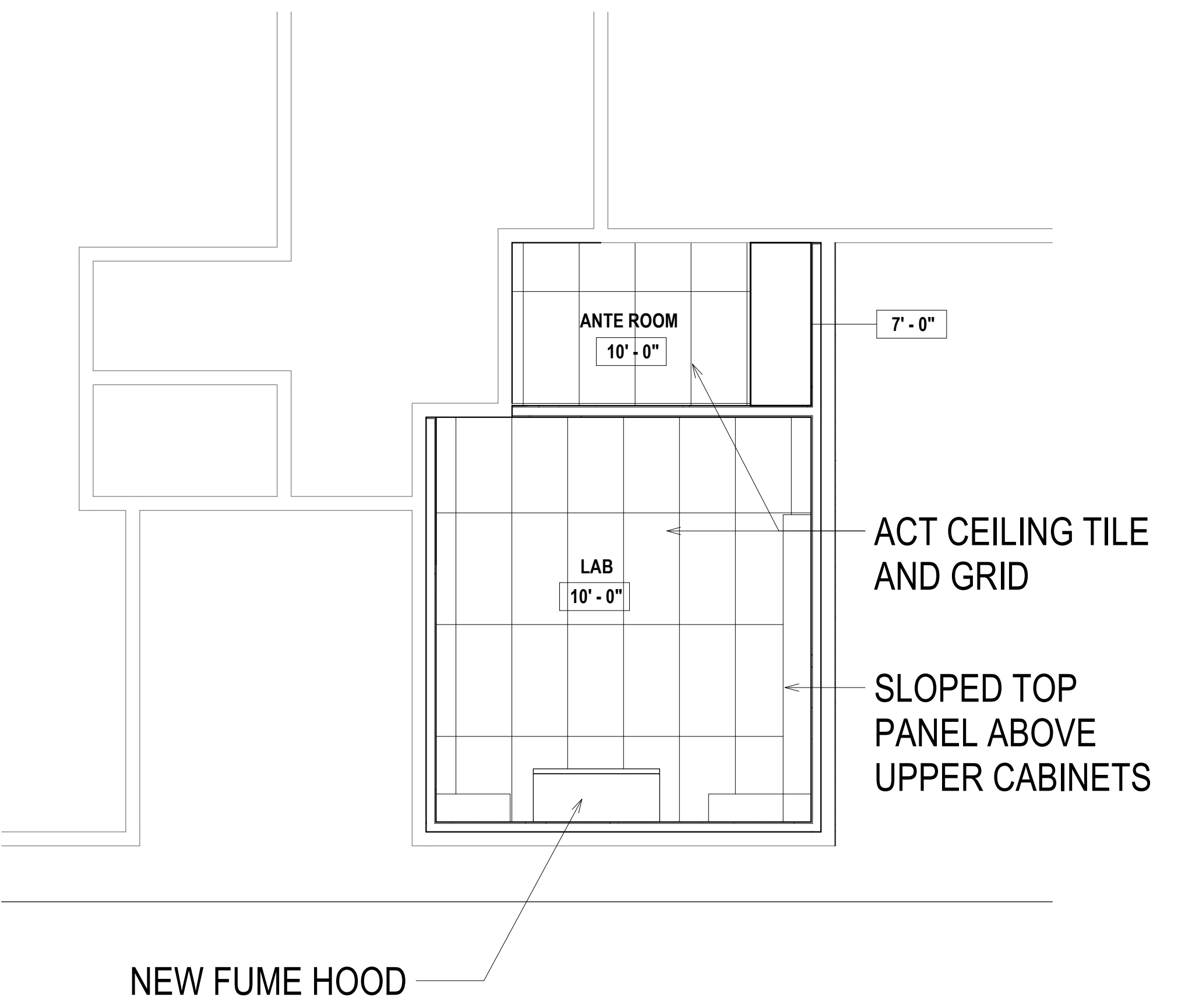
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 A111



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

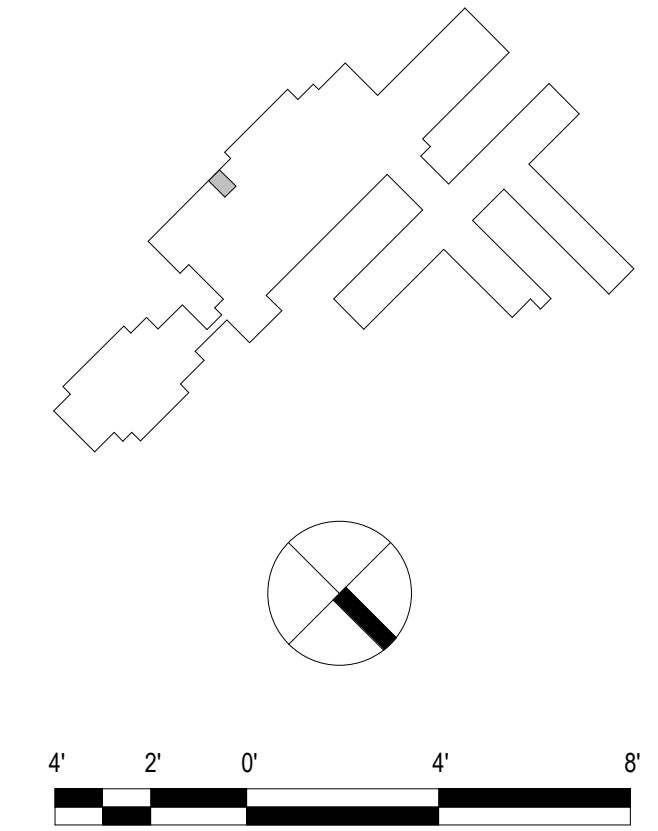


3 ENLARGED DEMOLITION FLOOR PLAN
SCALE: 1/4" = 1'-0"



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

- LEGEND**
- CONCRETE MASONRY UNITS
 - CONCRETE
 - METAL STUD WALL



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KVMH COVID LAB

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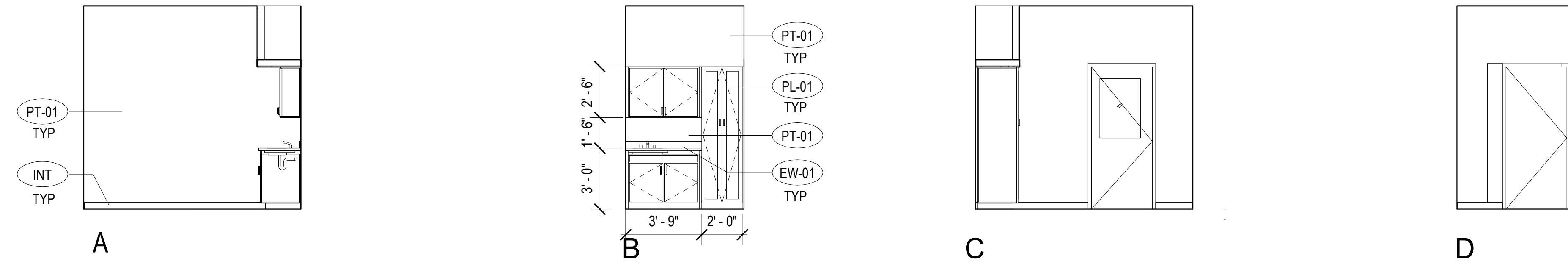
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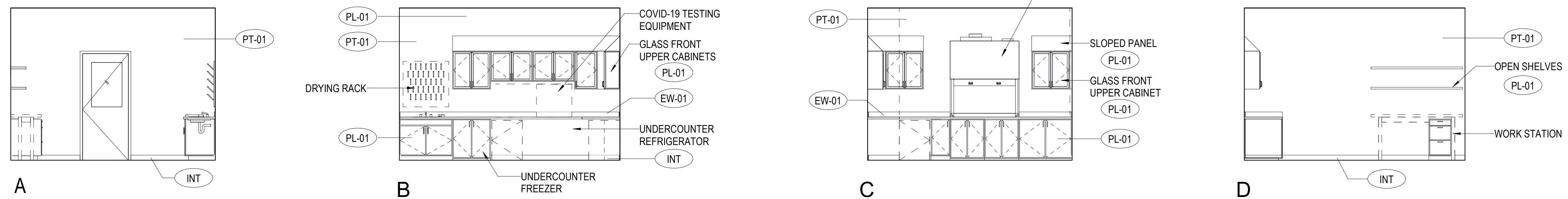
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1 ANTE ROOM INTERIOR ELEVATION
 SCALE: 1/4" = 1'-0"



2 COVID LAB INTERIOR ELEVATIONS
 SCALE: 1/4" = 1'-0"

REVISIONS		
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KVMH COVID LAB

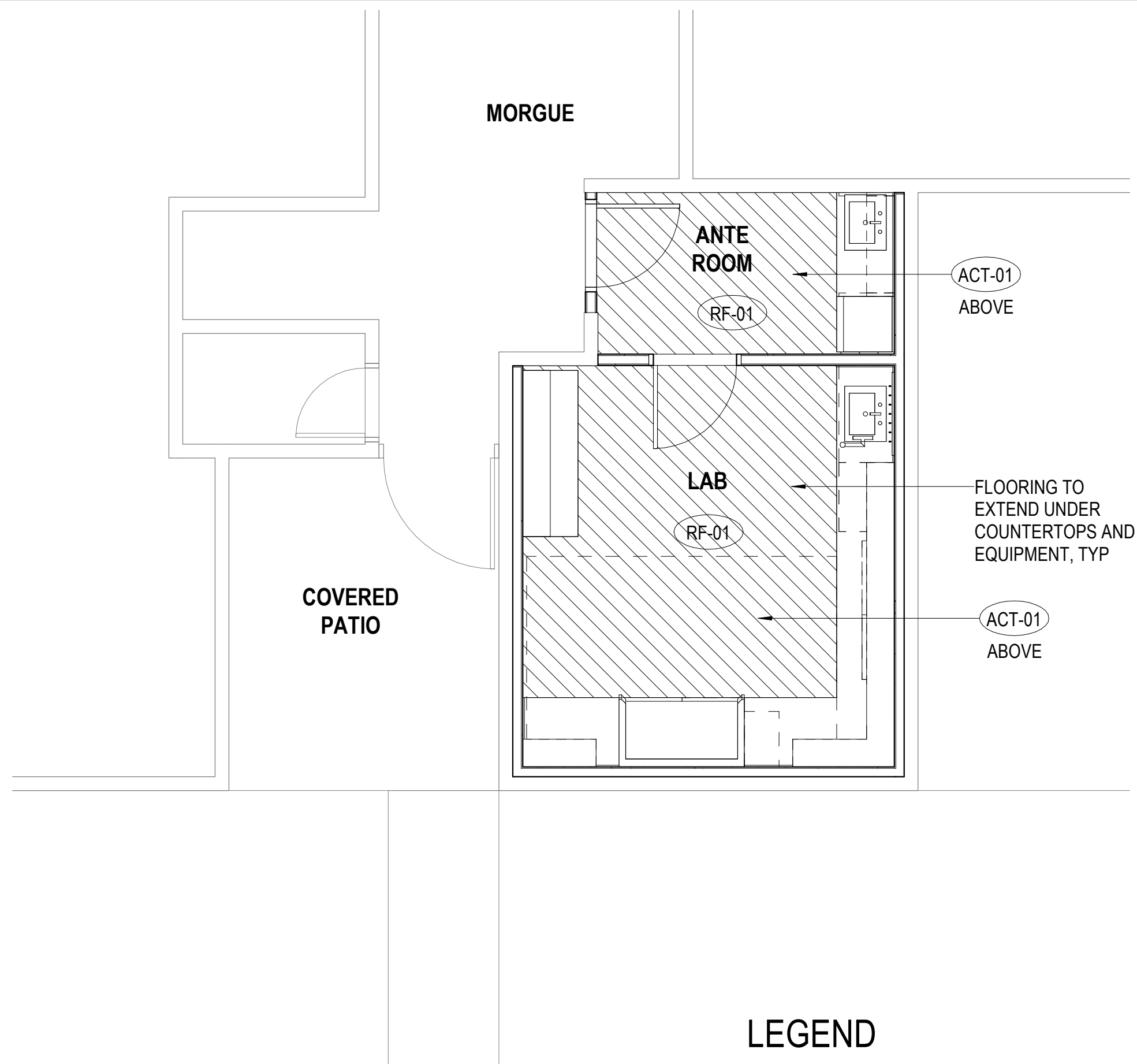
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INTERIOR ELEVATIONS, FINISH FLOOR PLAN AND COLOR MATERIAL FINISH SCHEDULE

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SHEET ISSUE DATE: 11/30/20	

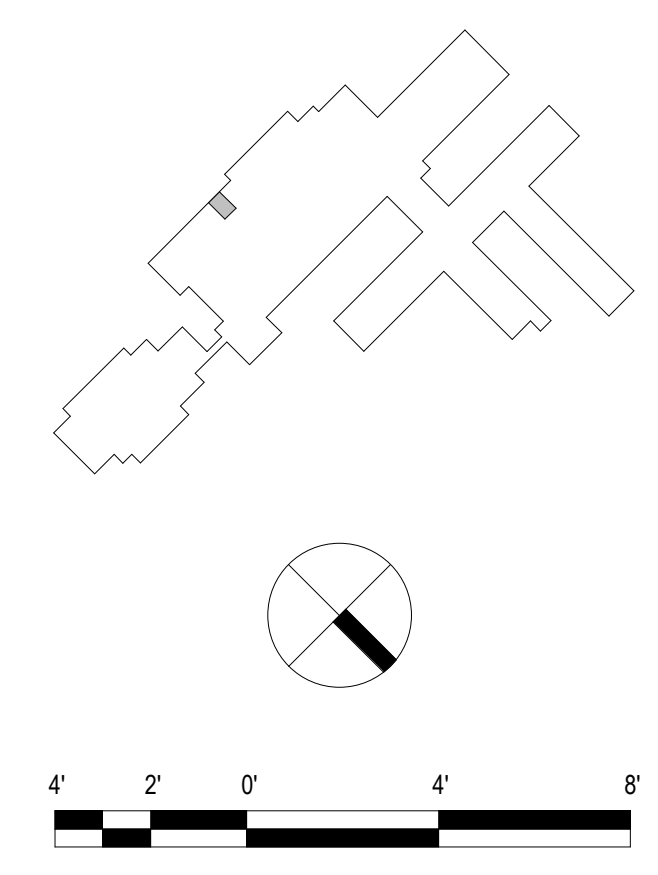
COLOR MATERIAL FINISH SCHEDULE							
MARK	MATERIAL DESCRIPTION	MANUFACTURER	MATERIAL NAME	MATERIAL SIZE	MATERIAL FINISH	NO/COLOR	LOCATION USED/REMARKS
ACT-01	ACOUSTIC CEILING TILE	USG INTERIORS, INC	OPTIMA HEALTH ZONE	24"x48"		STANDARD WHITE	ANTE ROOM, LAB ROOM
EW-01	EPOXY RESIN WORKSURFACE	DURCON INTERNATIONAL	CLASSICTOP WORKSURFACES	1-1/2" THICKNESS	TBD	TBD	ANTE ROOM, LAB ROOM
INT	INTEGRAL BASE	ARMSTRONG FLOORING	--	--	--	--	ANTE ROOM, LAB ROOM
PL-01	PLASTIC LAMINATE	WILSONART	--	--	TBD	TBD	ANTE ROOM, LAB ROOM
PT-01	WALL PAINT	BENJAMIN MOORE	ULTRA SPEC SCRUFF-X	--	EGGSHELL	TBD	ANTE ROOM, LAB ROOM
RF-01	RESILIENT SHEET FLOORING	ARMSTRONG FLOORING	MEDIN PURE	6'-7" WIDE ROLL	DIAMOND 10 TECHNOLOGY COATING	TBD	ANTE ROOM, LAB ROOM



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

LEGEND

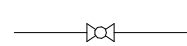


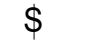

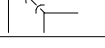
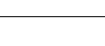
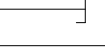
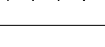

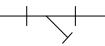





SHEET VINYL

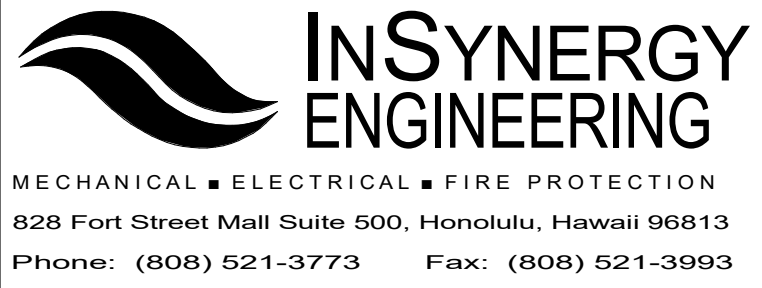


MECHANICAL GENERAL NOTES:

1. EXAMINE THE PROJECT SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND THE EXTENT OF REMOVAL, RELOCATION, RECONNECTION AND/OR NEW WORK PRIOR TO BIDDING. NOTIFY AND COORDINATE WITH THE CONTRACTING OFFICER FOR ANY MAJOR DEVIATIONS DUE TO UNFORESEEN OR VARYING FIELD CONDITIONS. BID SUBMISSION SHALL BE CONSIDERED AS EVIDENCE THAT THE SUBCONTRACTOR HAS VISITED THE SITE AND HAS RESOLVED ALL DISCREPANCIES AND QUESTIONS AND NO EXTRA PAYMENT WILL BE AUTHORIZED FOR WORK MADE NECESSARY BY THE SUBCONTRACTOR'S FAILURE TO DO SO.

MECHANICAL LEGEND

SYMBOL	ABBRV.	DESCRIPTION	SYMBOL	ABBRV.	DESCRIPTION
	ADJ	ADJUSTABLE		MCC	MOTOR CONTROL CENTER
	AHU	AIR HANDLING UNIT		(N)	NEW
	AUX	AUXILLIARY		NO	NORMALLY OPEN
		BALL VALVE		NC	NORMALLY CLOSED
	BDD	BACK DRAFT DAMPER		OWS	OPERATOR WORKSTATION
	BV	BUTTERFLY VALVE		POR	POINT OF REMOVAL
	CD	CONDENSATE DRAIN		POC	POINT OF CONNECTION
	CDWP	CONDENSER WATER PUMP		SS	START STOP
	CDWS	CONDENSER WATER SUPPLY		SW	SWITCH
	CDWR	CONDENSER WATER RETURN		(R)	RELOCATED
	CH	CHILLER		TC	TIMECLOCK
	CHWP	CHILLED WATER PUMP		TD	TIME DELAY
	CHWR	CHILLED WATER RETURN		TEMP	TEMPERATURE
	CHWS	CHILLED WATER SUPPLY		TS	TEMPERATURE SENSOR
	CR	CONTACT RELAY			THERMOMETER
	CV	CONTROL VALVE			TURNING VANES
	CT	COOLING TOWER		VD	VOLUME DAMPER
	DDC	DIRECT DIGITAL SYSTEM		VFD	VARIABLE FREQUENCY DRIVE
	DGP	DATA GATHERING PANEL			CAPPED/STUBOUT PIPE
(E)	EXIST.	EXISTING		RPBFP	REDUCED PRESSURE BACKFLOW PREVENTER
	EA/OA	EXHAUST AIR/OUTSIDE AIR		SD	DUCT SMOKE DETECTOR
	EAG	EXHAUST AIR GRILLE		ST	STORAGE TANK
	EF	EXHAUST FAN			STRAINER
	EMCS/EMS	ENERGY MANAGEMENT CONTROL SYSTEM		T & P	TEMPERATURE AND PRESSURE RELIEF VALVE
	ER	EXHAUST REGISTER			PRESSURE GAUGE
	EXH.	EXHAUST			UNION
	FS	FLOW SWITCH			
	IV	ISOLATION VALVE			
	H-O-A	HAND-OFF-AUTO			
	JCH	JOCKEY CHILLER			
	JCHS	JOCKEY CHILLED WATER SUPPLY			
	JCHWP	JOCKEY CHILLED WATER PUMP			
	LVR	LOUVER			
		MANUAL AIR VENT			
	(M)	MOTOR (ELECTRIC)			



REVISIONS		
#	Date	Description

SCHEMATIC DESIGN
12/14/2020

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License Expiration Date

PROJECT TITLE

**KAUAI HHSC CT
SCANNER RENOVATIONS**

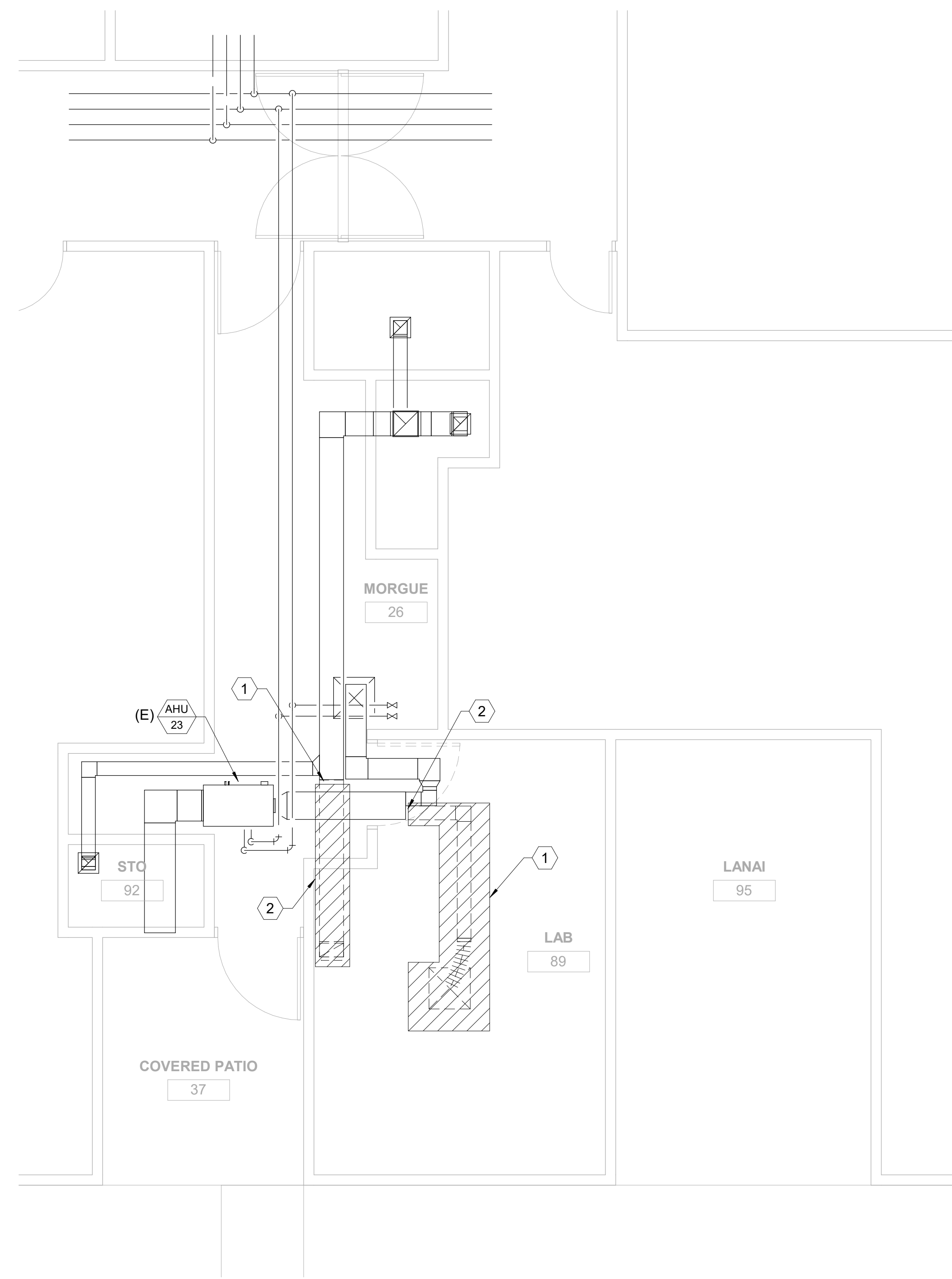
KVMH - COVID LAB

FILENAME:
C:\Users\keola\Documents\KVMH Covid Lab
M18_kwilliams25L9J.rvt

DRAWING TITLE

**MECHANICAL NOTES AND
LEGENDS**

SCALE: 12" = 1'-0"	
DRAWN BY: KW	CHECKED BY: YH
PROJECT NO. 20162	DRAWING NO. M-001
SHEET ISSUE DATE: 12/14/2020	



- KEYED NOTES:**
- ① REMOVE EXISTING DUCTWORK SERVING AUTOPSY ROOM
 - ② POINT OF REMOVAL AND CAP
- (E)

REVISIONS

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KAUAI HHSC CT SCANNER RENOVATIONS

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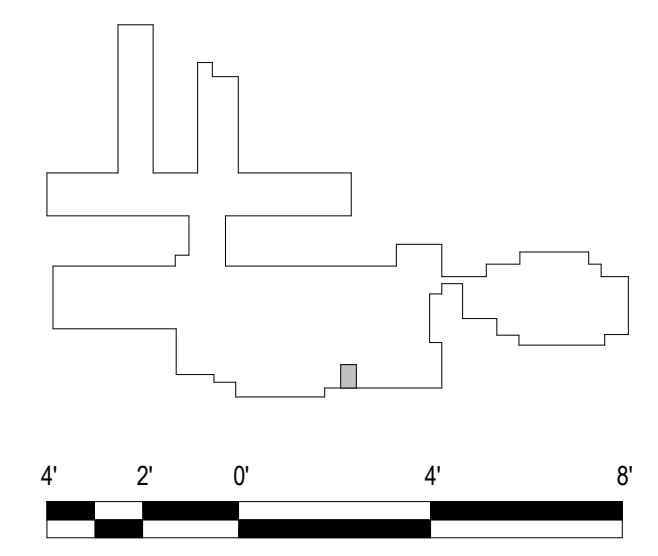
DRAWING TITLE

MECHANICAL DEMOLITION PLAN

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

DRAWN BY: KW	CHECKED BY: YH
PROJECT NO. 20162	DRAWING NO. M-101
SHEET ISSUE DATE: 12/14/2020	

① **MECHANICAL DEMOLITION PLAN**
 SCALE: 1/4" = 1'-0"



DEDICATED OUTDOOR AIR UNIT SCHEDULE

UNIT	AREA SERVED	LOCATION	TYPE	EXTERNAL STATIC PRESSURE (IN WATER)	TOTAL CAPACITY (BTU/HR)	SENSIBLE CAPACITY (BTU/HR)	REHEAT CAPACITY (BTU/HR)	FAN								HOT WATER REHEAT COIL					CHILLED WATER COIL			ELECTRICAL	REMARKS			
								DESIGN AIRFLOW (CFM)	EXISTING AIRFLOW (CFM)	RPM	ENTERING DB (°F)	ENTERING WB (°F)	LEAVING CC DB (°F)	LEAVING CC WB (°F)	LEAVING REHEAT COIL (°F)	MOTOR SIZE (HP)	INLET (°F)	OUTLET (°F)	MIN. ROWS	PD (FT)	FLOW (GPM)	INLET (°F)	OUTLET (°F)			MIN. ROWS	PD (FT)	FLOW (GPM)
(E)AHU-23	MORGUE	MORGUE	CAV	1.0	46900	24600	N/A	330	750	1800	87.0	74.0	55.0	54.5	N/A	3/4	N/A	N/A	N/A	N/A	N/A	44.0	54.0	4	8	9	208 / 3 / 60	REBALANCE AHU TO DESIGN AIRFLOW
DOAS-1	COVID LAB	COVID LAB	CAV	1.0	26400	12700	7400	400	N/A	1800	85.0	75.0	55.0	54.5	70.0	2/3	140.0	120.0	6	2	0.7	44.0	54.0	6	8	5	208 / 3 / 60	1,2,3,4

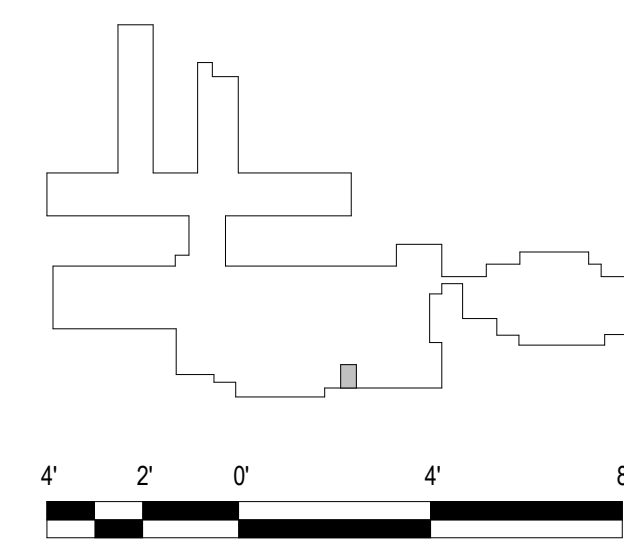
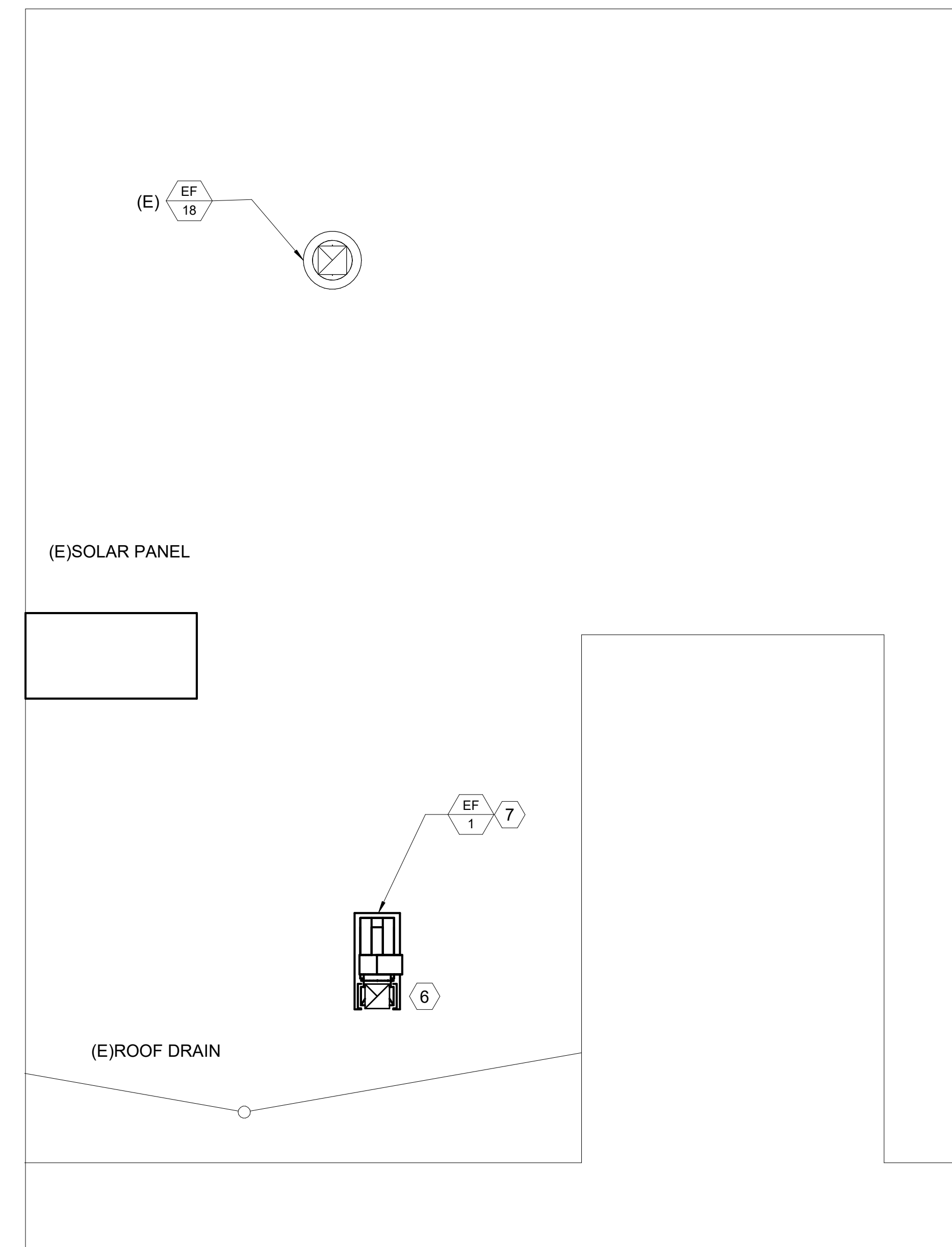
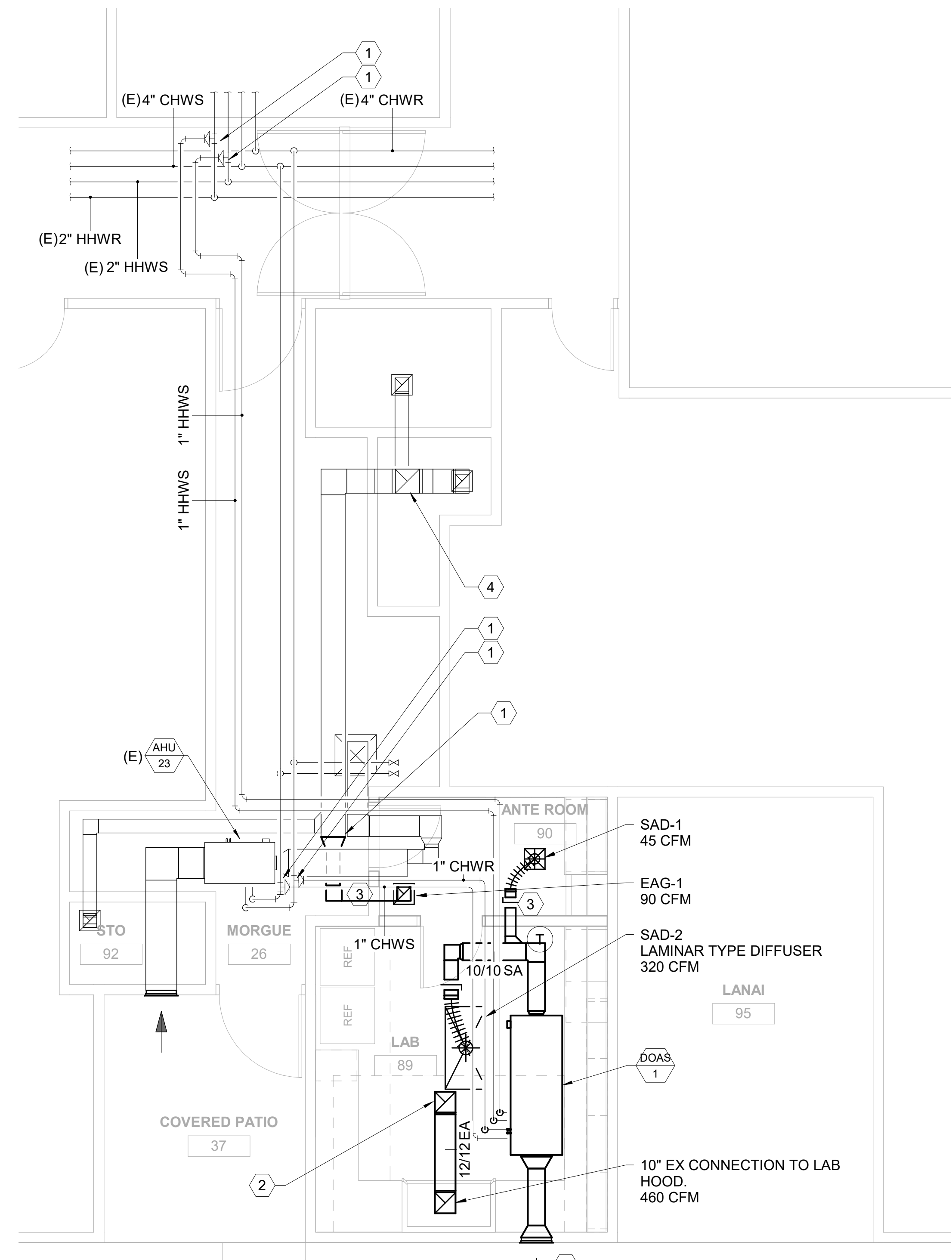
1. PROVIDE WITH INTEGRAL FAN SPRING ISOLATORS
2. VFD WITH SOFT START AND DISCONNECT, INSTALLED BY ELECTRICAL, IN NEMA 1 ENCLOSURE
3. PROVIDE INTEGRAL UV LIGHT AND DOOR SWITCHES
4. PROVIDE MERV 13 FILTER, MERV 8 PREFILTER

FAN SCHEDULE

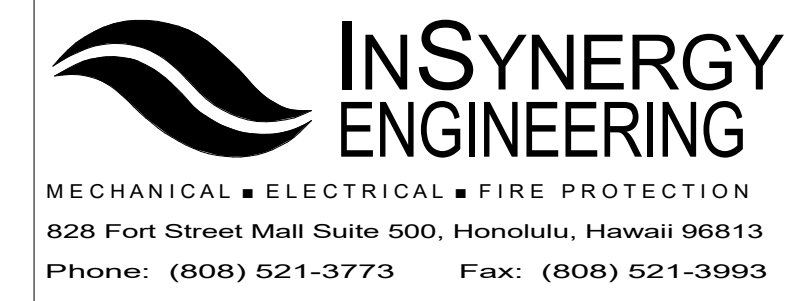
UNIT	AREA SERVED	LOCATION	TYPE	FAN DATA				ELECTRICAL		MAX. DBA	REMARKS
				MOTOR SIZE (HP)	DESIGN AIRFLOW (CFM)	EXISTING AIRFLOW (CFM)	ESP (IN WATER)	V / P / HZ			
(E)EF-18	MORGUE	ROOF	ROOFTOP DOWNBLAST	1/4	330	750	1.0	208 / 3 / 60	-	-	REBALANCE EF TO DESIGN AIRFLOW
EF-1	COVID LAB	ROOF	CENTRIFUGAL UTILITY FUME EXHAUST FAN	1/4	460	N/A	0.3	208 / 3 / 60	65	-	PROVIDE VFD IN NEMA 4X ENCLOSURE

KEYED NOTES:

- 1 CONNECT TO EXISTING SYSTEM
- 2 14X14 EA UP TO EF-1 ON ROOF
- 3 PROVIDE PRESSURE DIFFERENTIAL SENSOR
- 4 14X14 UP TO (E)EF-18 ON ROOF
- 5 18X12 OA LOUVER
- 6 12X12 EA DN TO LAB HOOD
- 7 PROVIDE VFD IN NEMA 4X ENCLOSURE



1 MECHANICAL NEW WORK PLAN
SCALE: 1/4" = 1'-0"



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12/14/2020

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PROJECT TITLE

KAUAI HHSC CT SCANNER RENOVATIONS

KVMH - COVID LAB

FILENAME:
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DRAWING TITLE

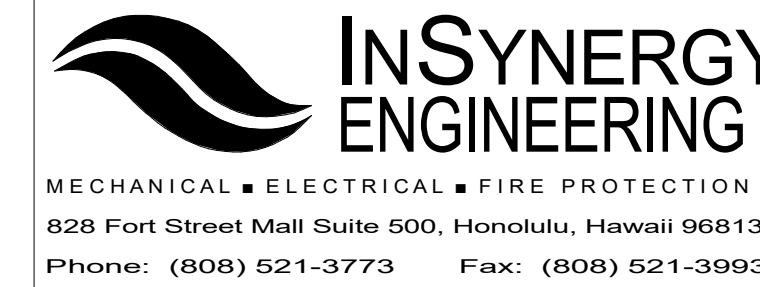
MECHANICAL NEW WORK PLAN

SCALE: 1/4" = 1'-0"	CHECKED BY: YH
DRAWN BY: KW	PROJECT NO. 20162
SHEET ISSUE DATE: 12/14/2020	DRAWING NO. M-201

MECHANICAL GENERAL NOTES:

- EXAMINE THE PROJECT SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND THE EXTENT OF REMOVAL, RELOCATION, RECONNECTION AND/OR NEW WORK PRIOR TO BIDDING. NOTIFY AND COORDINATE WITH THE CONTRACTING OFFICER FOR ANY MAJOR DEVIATIONS DUE TO UNFORESEEN OR VARYING FIELD CONDITIONS. BID SUBMISSION SHALL BE CONSIDERED AS EVIDENCE THAT THE SUBCONTRACTOR HAS VISITED THE SITE AND HAS RESOLVED ALL DISCREPANCIES AND QUESTIONS AND NO EXTRA PAYMENT WILL BE AUTHORIZED FOR WORK MADE NECESSARY BY THE SUBCONTRACTOR'S FAILURE TO DO SO.

PLUMBING LEGEND		
SYMBOL	ABBRV.	DESCRIPTION
	BD	BLOWDOWN
	BT	BATHTUB
		CAP
	CDR	CONDENSATE RETURN
	CO	CLEANOUT
	CW	COLD WATER
	DF	DRINKING FOUNTAIN
	DW	DISHWASHER
	(E)	EXISTING
	EQ	EQUIPMENT
	EWC	ELECTRIC WATER COOLER
	FM	FLOW METER
	HB	HOSE BIBB
	HWR	HOT WATER RETURN
	HWRP	HOT WATER RETURN PUMP
	HW	HOT WATER SUPPLY
	HWST	HOT WATER STORAGE TANK
	HX	HEAT EXCHANGER
	JS	JANITOR SINK
	LAV	LAVATORY SINK
	MPR	MEDIUM PRESSURE CONDENSATE RETURN
	MPS	MEDIUM PRESSURE STEAM
	MS	MOP SINK
	N.C.	NORMALLY CLOSED
	N.O.	NORMALLY OPEN
		PIPE UP, TEE DOWN, PIPE DOWN
	POC	POINT OF CONNECTION
	POR	POINT OF REMOVAL AND DEMO
	PRV	PRESSURE REDUCING VALVE
	PS	PRESSURE SENSOR
	PSI	POUNDS PER SQUARE INCH
	SHO	SHOWER
	SK	SINK
	TS	TEMPERATURE SENSOR
	TXV	THERMOSTATIC MIXING VALVE
	UR	URINAL
	V	VENT
	VTR	VENT THRU ROOF
	WC	WATER CLOSET
	WHA	WATER HAMMER ARRESTOR



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12/14/2020		

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PROJECT TITLE

**KAUAI HHSC CT
SCANNER RENOVATIONS**

KVMH - COVID LAB

FILENAME:
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DRAWING TITLE

PLUMBING NOTES AND LEGENDS

SCALE: 12" = 1'-0"	
DRAWN BY: KW	CHECKED BY: YH
PROJECT NO. 20162	DRAWING NO. P-001
SHEET ISSUE DATE: 12/14/2020	

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 SCANNER RENOVATIONS**

KVMH - COVID LAB

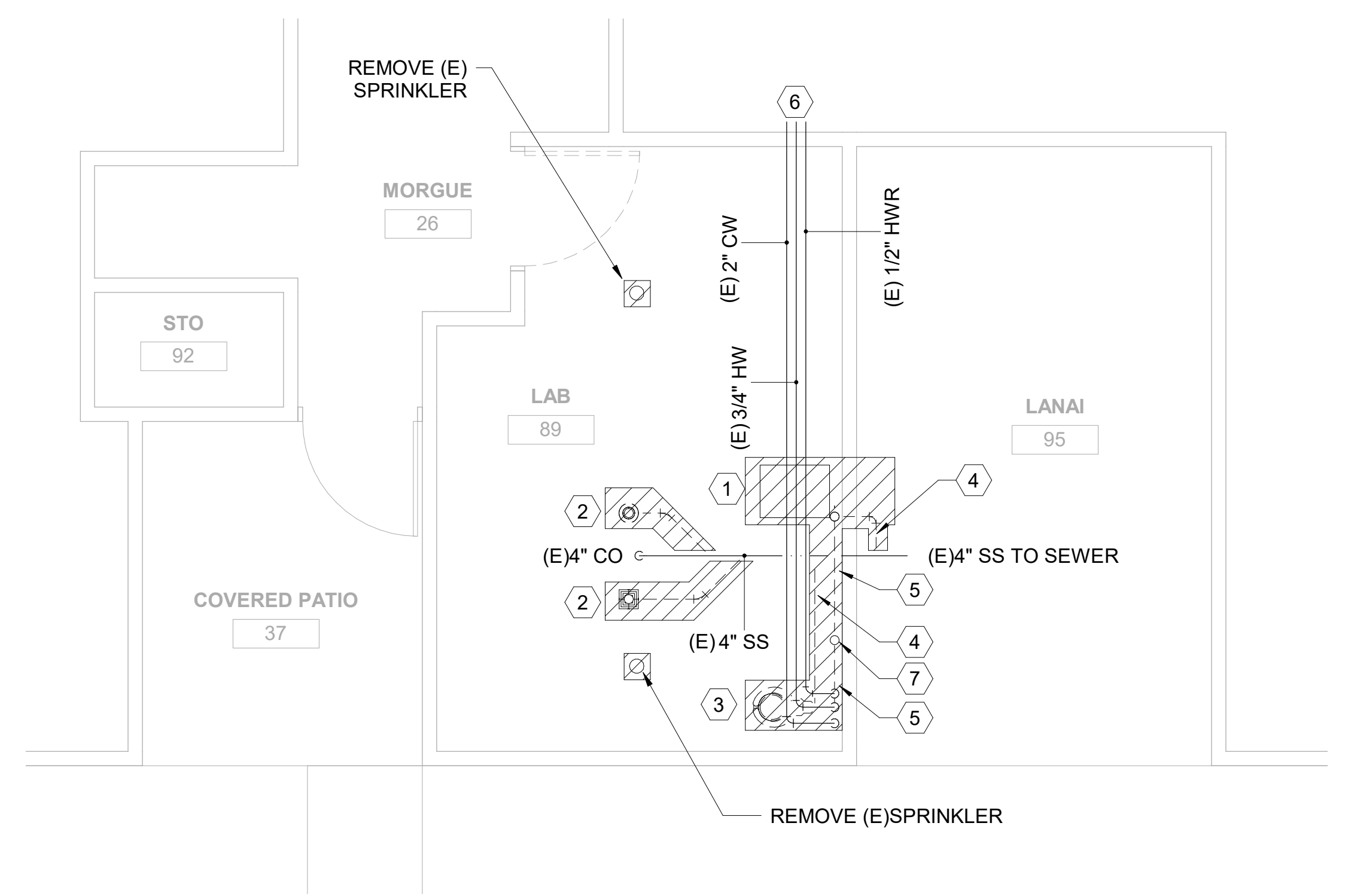
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DRAWING TITLE

PLUMBING DEMOLITION PLAN

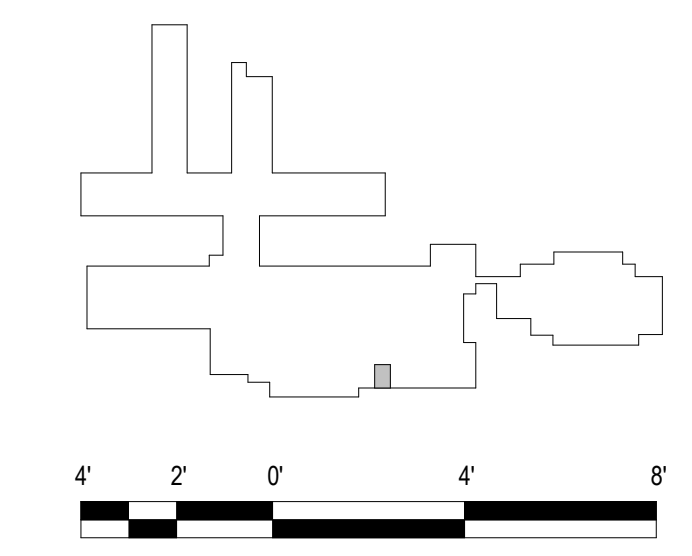
SCALE: 1/4" = 1'-0"

DRAWN BY: KW	CHECKED BY: YH
PROJECT NO. 20162	DRAWING NO. P-101
SHEET ISSUE DATE: 12/14/2020	



- KEYED NOTES:**
- ① REMOVE (E)SINK
 - ② REMOVE (E)FLOOR DRAIN AND ASSOCIATED PIPING
 - ③ REMOVE (E)WASTE DISPOSAL UNIT
 - ④ REMOVE SS PIPING
 - ⑤ REMOVE VENT PIPING
 - ⑥ (E)DOMESTIC PIPING. VALVES IN HALLWAY
 - ⑦ REMOVE VENT PIPING THROUGH ROOF. REUSE PENETRATION FOR NEW VTR

1 PLUMBING DEMOLITION PLAN
 SCALE: 1/4" = 1'-0"



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PROJECT TITLE

KAUAI HHSC CT SCANNER RENOVATIONS

KVMH - COVID LAB

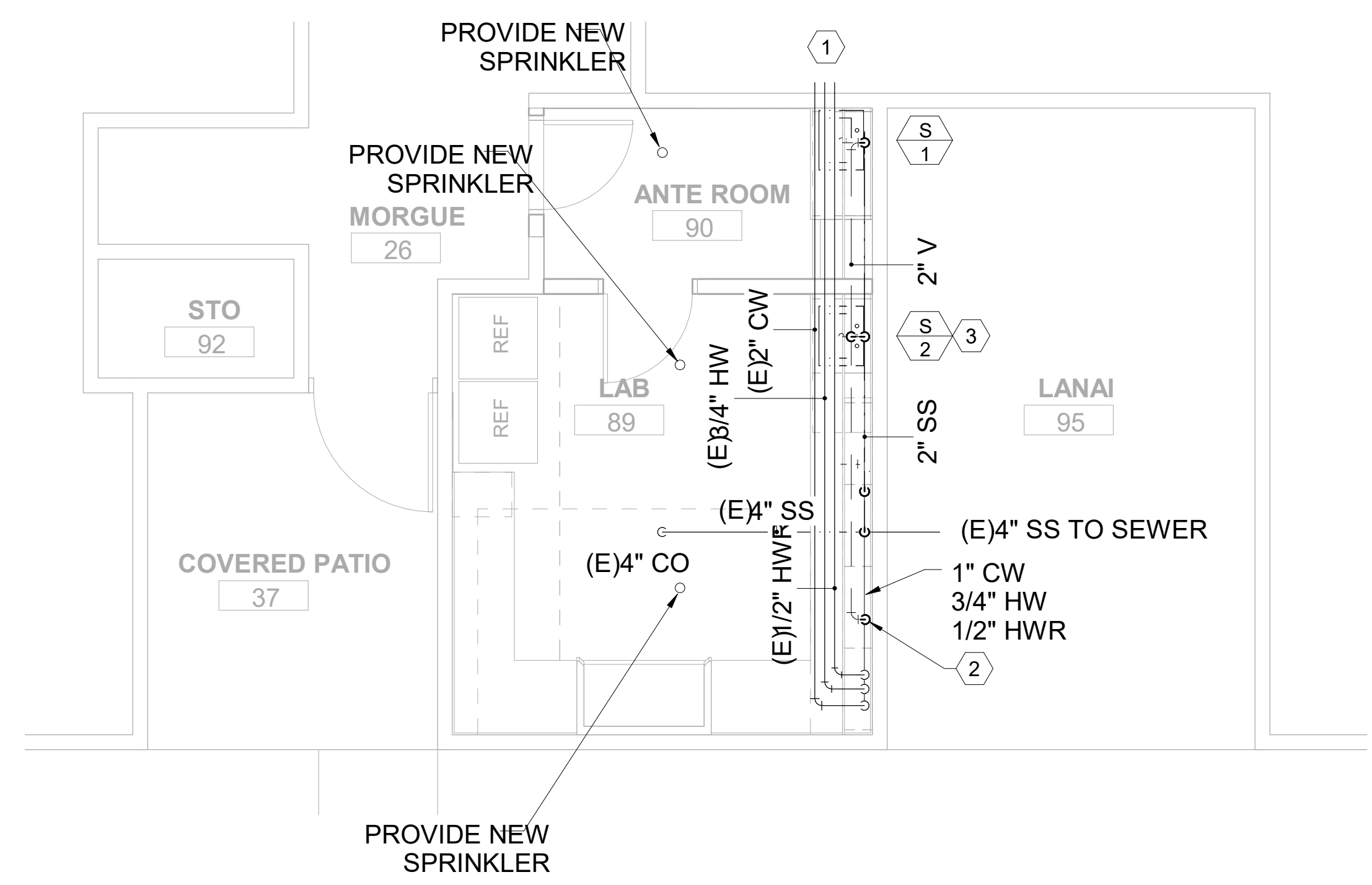
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DRAWING TITLE

PLUMBING NEW WORK PLAN

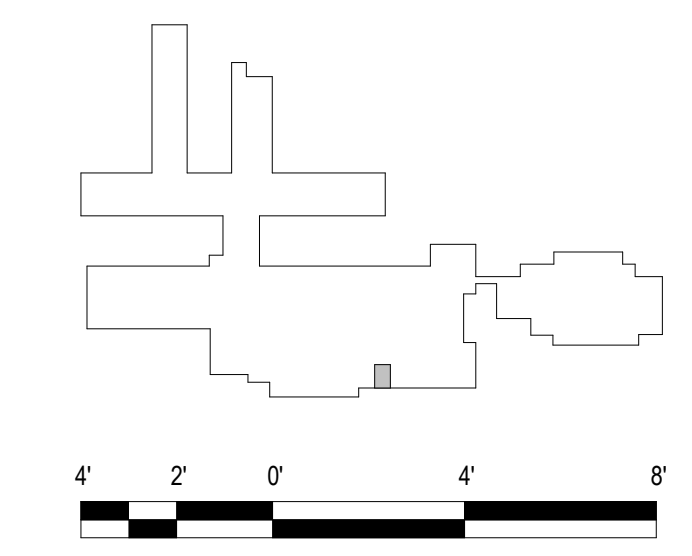
SCALE: 1/4" = 1'-0"

DRAWN BY: KW	CHECKED BY: YH
PROJECT NO. 20162	DRAWING NO. P-102
SHEET ISSUE DATE: 12/14/2020	



- KEYED NOTES:**
- ① (E)DOMESTIC PIPING. VALVES IN HALLWAY
 - ② VTR
 - ③ PROVIDE WITH EMERGENCY EYE WASH

1 PLUMBING NEW WORK PLAN
 SCALE: 1/4" = 1'-0"



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ELECTRICAL GENERAL NOTES

1. ALL WORK SHOWN ON THE ELECTRICAL DRAWINGS IS NEW UNLESS OTHERWISE NOTED. ALL MATERIALS SHALL BE NEW AND "LISTED" OR "LABELED" AS DEFINED BY THE NATIONAL ELECTRIC CODE (NEC). WORK INCLUDES INSTALLATION OF ALL ELECTRICAL SYSTEMS COMPLETE AND OPERATIONAL AS LIMITED BY THE INTENT OF THE CONTRACT DOCUMENTS.
2. ALL WORK SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE (NEC), NATIONAL ELECTRIC SAFETY CODE AND BUILDING ORDINANCES OF THE CITY AND COUNTY OF KAUAI. CONSTRUCTION PRACTICES SHALL CONFORM TO THE LATEST EDITION OF AMERICAN ELECTRICIANS' HANDBOOK BY CROFT, AND APPLICABLE INSTRUCTIONS OF MANUFACTURERS OF EQUIPMENT AND MATERIAL SUPPLIED FOR THIS PROJECT.
3. OBTAIN AND PAY FOR BUILDING / ELECTRICAL PERMIT, ARRANGE FOR PERIODIC INSPECTION BY LOCAL AUTHORITIES, AND DELIVER CERTIFICATE OF FINAL INSPECTION THE THE OWNER.
4. SEC. 18-5.2 RETENTION OF PLANS: ONE SET OF APPROVED PLANS, SPECIFICATIONS, AND COMPUTATIONS SHALL BE RETAINED BY THE BUILDING OFFICIAL FOR A PERIOD OF NOT LESS THAN 90 DAYS FROM DATE OF COMPLETION OF THE WORK COVERED THEREIN, AND ONE SET OF APPROVED PLANS SHALL BE RETURNED TO THE APPLICANT, AND SAID SET SHALL BE KEPT ON THE SITE OF THE BUILDING OR WORK AT ALL TIMES DURING WHICH THE WORK AUTHORIZED THEREBY IS IN PROGRESS. (SEC. 18-5.2 R.O 1978 (1983 ED.); AM. ORD. 93-59).
5. STRUCTURES UNDERGOING CONSTRUCTION, ALTERATION, OR DEMOLITION OPERATIONS, INCLUDING THOSE IN UNDERGROUND LOCATIONS, SHALL COMPLY WITH NFPA 241, STANDARD FOR SAFEGUARDING CONSTRUCTION, ALTERATION, AND DEMOLITION OPERATIONS, AND NFPA 1 2012, AS AMENDED.
6. FIRE SAFETY DURING ALTERATION :
 - a. 16.4.4.1 WHERE THE BUILDING IS PROTECTED BY FIRE PROTECTION SYSTEMS, SUCH SYSTEMS SHALL BE MAINTAINED OPERATIONAL AT ALL TIMES DURING ALTERATION.
 - b. 16.4.4.2 WHERE ALTERATION REQUIRES MODIFICATION OF A PORTION OF THE FIRE PROTECTION SYSTEM, THE REMAINDER OF THE SYSTEM SHALL BE KEPT IN SERVICE AND THE FIRE DEPARTMENT SHALL BE NOTIFIED.
 - c. 16.4.4.3 WHEN IT IS NECESSARY TO SHUT DOWN THE SYSTEM, THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE ALTERNATE MEASURES OF PROTECTION UNTIL THE SYSTEM IS RETURNED TO SERVICE.
 - d. 10.8.1.1 AS NECESSARY DURING EMERGENCIES, MAINTENANCE, DRILLS, PRESCRIBED TESTING, ALTERATIONS, OR RENOVATIONS, PORTABLE OR FIXED FIRE-EXTINGUISHING SYSTEMS OR DEVICES OR ANY FIRE-WARNING SYSTEM SHALL BE PERMITTED TO BE MADE INOPERATIVE OR INACCESSIBLE. A FIRE WATCH SHALL BE REQUIRED AS SPECIFIED IN SECTIONS 13.3.3.6.5.2(4)(b), 13.7.1.4.4, 16.5.4, 34.6.3.3, 41.2.2.6, 41.2.2.7, 41.2.4, 41.3.5, 41.4.1, 34.5.4.3, AND 25.1.8 AT NO COST TO THE AHJ. NFPA 1 2012, AS AMENDED.
7. THE DRAWINGS DO NOT REFLECT ALL THE EXISTING CONDITIONS THAT MAY BE ENCOUNTERED DURING CONSTRUCTION. VISIT THE PROJECT SITE AND BECOME FAMILIAR WITH THE EXISTING CONDITIONS, THE EXTENT OF ANY DEMOLITION, RELOCATION, RECONNECTION, AND THE NEW WORK PRIOR TO THE START OF ON-SITE CONSTRUCTION ACTIVITIES. REPORT ANY DISCREPANCIES AND/OR DIFFERENCES BETWEEN THE EXISTING CONDITIONS AND THE CONSTRUCTION DOCUMENTS TO THE ARCHITECT. RESOLVE ALL DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. BID SUBMISSION SHALL BE CONSIDERED AS EVIDENCE THAT THE CONTRACTOR HAS VISITED THE SITE AND RESOLVED ALL DISCREPANCIES AND QUESTIONS AND NO EXTRA PAYMENT WILL BE AUTHORIZED FOR WORK REQUIRED BY THE CONTRACTOR'S FAILURE TO DO SO.
8. COORDINATE ALL ELECTRICAL WORK WITH THE WORK OF THE OTHER TRADES AND SCHEDULE WORK TO MINIMIZE THE NUMBER AND DURATION OF ELECTRICAL OUTAGES AND IMPACT TO THE OPERATIONS IN OR ADJACENT TO THE PROJECT AREA. COORDINATE ACCESS TO THE PROJECT AREA AND SCHEDULE ALL REQUIRED SYSTEM OUTAGES WITH THE OWNER.
9. VERIFY AND COORDINATE ALL PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS PRIOR TO THE START OF CONSTRUCTION. OBTAIN APPROVAL BEFORE MAKING ANY PENETRATIONS THROUGH STRUCTURAL MEMBERS OR FIRE RATED WALLS AND CEILINGS.
10. SCAN (E.G. X-RAY, ELECTROMAGNETIC, ETC.) ALL CONCRETE WALLS OR FLOOR STRUCTURES PRIOR TO COMMENCING WITH CORING/DRILLING WORK FOR PENETRATIONS TO AVOID DAMAGING THE EXISTING REINFORCING STEEL.
11. COORDINATE AND PROVIDE ACCESS PANELS FOR ALL CONCEALED ELECTRICAL EQUIPMENT, DEVICES, BOXES AND CONDUIT BODIES SO THAT THEY ARE ACCESSIBLE.
12. EXISTING DEVICE AND EQUIPMENT LOCATIONS, CIRCUIT ASSIGNMENTS, WIRING CONNECTIONS, AND CONDUIT RUNS INDICATED WERE DERIVED FROM AVAILABLE REFERENCE DOCUMENTS AND LIMITED FIELD INVESTIGATION. FIELD VERIFY ALL EXISTING CONDITIONS AND MAKE ANY NECESSARY ADJUSTMENTS TO SATISFY THE INTENT OF THE DRAWINGS AND SPECIFICATIONS.
13. RE-ROUTE ALL EXISTING CONDUIT, WIRING AND CABLING TO REMAIN WITHIN THE PROJECT AREA AS NECESSARY TO FACILITATE THE REMOVAL OF EXISTING EQUIPMENT AS WELL AS THE INSTALLATION OF ALL NEW EQUIPMENT. REMOVE AND RE-INSTALL ELECTRICAL EQUIPMENT, INCLUDING LIGHTS, TO REMAIN AS REQUIRED.
14. WORK INCIDENTAL TO THE CONTRACT AND NECESSARY TO COMPLETE THE PROJECT, ALTHOUGH NOT SPECIFICALLY REFERRED TO IN THE CONTRACT DOCUMENTS. SHALL BE FURNISHED AND PERFORMED BY THE COONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT. AN EXAMPLE OF SUCH INCIDENTAL WORK ARE JUNCTION BOXES AND PULL BOXES REQUIRED FOR THE INSTALLATION OF ELECTRICAL DEVICES AND EQUIPMENT. ALL INCIDENTAL WORK SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE.
15. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE ALL CONDUIT AND WIRING FOR THE POWER CONNECTION TO ALL EQUIPMENT AS INDICATED IN THE DRAWINGS AND SPECIFICATIONS. ALL INCIDENTAL CONDUIT AND WIRING REQUIRED FOR A COMPLETE AND OPERATIONAL SYSTEM MAY NOT BE SHOWN IN THE DRAWINGS OR SPECIFICATIONS. CONTRACTOR SHALL COORDINATE INCIDENTAL CONDUIT AND WIRING REQUIREMENTS BETWEEN ALL TRADES TO ENSURE THE INCIDENTAL CONDUIT AND WIRING IS PROVIDED AND THE AFFECTED SYSTEMS OPERATE AS INTENDED.
16. THE LOCATION OF THE ELECTRICAL APPARATUS AND DEVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE AND BEFORE INSTALLING, STUDY THE ARCHITECTURAL, STRUCTURAL, AND MECHANICAL DETAILS AND MAKE INSTALLATION IN THE MOST LOGICAL MANNER. CIRCUIT ROUTING IS TYPICAL AND MAY BE VARIED IN ANY MANNER. ANY PIECE OF EQUIPMENT/DEVICE MAY BE RELOCATED WITHIN 10' BEFORE INSTALLATION AT THE DIRECTION OF THE ARCHITECT WITHOUT ADDITIONAL CHARGE TO THE PROJECT.
17. SHOULD PROJECT CONDITIONS REQUIRE REARRANGEMENT OF THE PROJECT'S WORK, THE CONTRACTOR SHALL MARK SUCH CHANGES ON THE AS-BUILT DRAWINGS. IF THESE CHANGES REQUIRE AN ALTERNATE METHOD TO THOSE SPECIFIED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUBMIT DRAWINGS TO REFLECT THE PROPOSED ALTERNATE METHODS TO THE ARCHITECT FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL NOT PROCEED UNTIL APPROVAL IS OBTAINED. REARRANGEMENT OF WORK FOR THE PURPOSE OF COORDINATION SHALL NOT BE CONSIDERED AN ITEM FOR EXTRA COST.
18. DISCONNECT AND REMOVE ALL ELECTRICAL APPARATUS, LIGHT FIXTURES, WIRING DEVICES, JUNCTION BOXES, AND ASSOCIATED FEEDER AND BRANCH CIRCUIT WIRING IN THE PROJECT AREA, UNLESS OTHERWISE NOTED. THE DEMOLITION DRAWINGS ARE INTENDED TO SHOW THE GENERAL LIMITS OF THE SCOPE OF WORK AND MAY NOT SHOW ALL THE EXISTING DEVICES, CONDUIT RUNS, ETC. FEEDER AND BRANCH CIRCUIT WIRING TO BE REMOVED SHALL BE DISCONNECTED FROM ITS SOURCE. REMOVE ALL CONDUCTORS AND CONDUIT AND CONDUIT SUPPORT STRUCTURES WHERE ACCESSIBLE. PATCH/REPAIR WALL, FLOOR AND CEILING DAMAGES AS A RESULT OF THE REMOVAL WORK.
19. THE EXISTING ELECTRICAL, TELECOM, FIRE ALARM, AND OTHER ELECTRICALLY-RELATED SYSTEMS IN AREAS ADJACENT TO, OUTSIDE OF, AND/OR OTHERWISE PASSING THROUGH THE PROJECT LIMITS, MUST REMAIN OPERATIONAL DURING THE CONSTRUCTION PERIOD AND POST-CONSTRUCTION. THE CONTRACTOR SHALL EXERCISE DUE CARE AND CAUTION WHEN WORKING NEAR ANY EXISTING EQUIPMENT, DEVICES, OR CABLING/CIRCUITING. PROVIDE NEW JUNCTION BOXES, CONDUITS & WIRING, AND THE LABOR REQUIRED TO FACILITATE THE REQUIRED OPERATIONAL CONTINUITY. BOXES, CONDUITS AND WIRING SHALL BE IN ACCORDANCE WITH THE NEC. ANY DAMAGE TO THE EXISTING EQUIPMENT, DEVICES OR CABLING/CIRCUITING RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED OR OTHERWISE RESTORED TO ITS ORIGINAL WORKING CONDITION AT NO ADDITIONAL COST TO THE PROJECT.
20. THE ELECTRICAL DRAWINGS ARE BASED ON PROPOSED EQUIPMENT. VERIFY ALL SYSTEM REQUIREMENTS (ELECTRICAL, MECHANICAL, FIRE ALARM, SPECIALTY SYSTEMS, ETC.) WITH THE SELECTED SYSTEM'S MANUFACTURER OR AUTHORIZED REPRESENTATIVE PRIOR TO COMMENCING WITH ANY WORK. COORDINATE RATINGS OF OVERCURRENT PROTECTION DEVICES, DISCONNECT SWITCHES, CONDUIT & WIRING TO MATCH THE ACTUAL EQUIPMENT SUPPLIED FOR THE PROJECT. CORRECT ALL DISCREPANCIES SO AS TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM. RECORD CHANGES ON THE AS-BUILT DRAWINGS.
21. ALL EQUIPMENT AND APPARATUS SHALL BE CAPABLE OF FITTING IN THE SPACES SHOWN WHILE MEETING THE MANUFACTURER'S RECOMMENDED ACCESS REQUIREMENTS AND APPLICABLE CODE REQUIREMENTS. REVIEW ALL SPACES WHERE EQUIPMENT IS TO BE INSTALLED PRIOR TO ORDERING OF EQUIPMENT AND NOTIFY THE ARCHITECT OF ANY INADEQUATE CLEARANCES OR CONDITIONS THAT WILL PREVENT THE PROPER INSTALLATION, MAINTENANCE, AND OPERATION OF THE EQUIPMENT.
22. CONFIRM THE TYPE OF CEILING BEING INSTALLED PRIOR TO ORDERING LUMINAIRES AND TRIMS FOR PROPER COORDINATION. LUMINAIRES INDICATED MAY NOT EXPRESSLY CONFIRM TYPE OF CEILING OR OPENING PROVIDED BY OTHER TRADES.
23. CONCEAL ALL CONDUIT; EXPOSED CONDUITS ARE PERMITTED ONLY WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. ALL EXPOSED CONDUITS IN FINISHED AREAS SHALL BE INSTALLED IN THE LEAST VISIBLE LOCATIONS. CARE SHALL BE TAKEN TO INSTALL CONDUIT IN THE MOST AESTHETICALLY PLEASING MANNER.

24. THE EXISTING ELECTRICAL, TELECOM, FIRE ALARM, AND OTHER ELECTRICALLY-RELATED SYSTEMS IN AREAS ADJACENT TO, OUTSIDE OF, AND/OR OTHERWISE PASSING THROUGH THE PROJECT LIMITS, MUST REMAIN OPERATIONAL DURING THE CONSTRUCTION PERIOD AND POST-CONSTRUCTION. THE CONTRACTOR SHALL EXERCISE DUE CARE AND CAUTION WHEN WORKING NEAR ANY EXISTING EQUIPMENT, DEVICES, OR CABLING/CIRCUITING. PROVIDE NEW JUNCTION BOXES, CONDUITS & WIRING, AND THE LABOR REQUIRED TO FACILITATE THE REQUIRED OPERATIONAL CONTINUITY. BOXES, CONDUITS AND WIRING SHALL BE IN ACCORDANCE WITH THE NEC. ANY DAMAGE TO THE EXISTING EQUIPMENT, DEVICES OR CABLING/CIRCUITING RESULTING FROM THE CONTRACTOR'S OPERATIONS SHALL BE IMMEDIATELY REPAIRED OR OTHERWISE RESTORED TO ITS ORIGINAL WORKING CONDITION AT NO ADDITIONAL COST TO THE PROJECT.
25. THE ELECTRICAL DRAWINGS ARE BASED ON PROPOSED EQUIPMENT. VERIFY ALL SYSTEM REQUIREMENTS (ELECTRICAL, MECHANICAL, FIRE ALARM, SPECIALTY SYSTEMS, ETC.) WITH THE SELECTED SYSTEM'S MANUFACTURER OR AUTHORIZED REPRESENTATIVE PRIOR TO COMMENCING WITH ANY WORK. COORDINATE RATINGS OF OVERCURRENT PROTECTION DEVICES, DISCONNECT SWITCHES, CONDUIT & WIRING TO MATCH THE ACTUAL EQUIPMENT SUPPLIED FOR THE PROJECT. CORRECT ALL DISCREPANCIES SO AS TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM. RECORD CHANGES ON THE AS-BUILT DRAWINGS.
26. ALL EQUIPMENT AND APPARATUS SHALL BE CAPABLE OF FITTING IN THE SPACES SHOWN WHILE MEETING THE MANUFACTURER'S RECOMMENDED ACCESS REQUIREMENTS AND APPLICABLE CODE REQUIREMENTS. REVIEW ALL SPACES WHERE EQUIPMENT IS TO BE INSTALLED PRIOR TO ORDERING OF EQUIPMENT AND NOTIFY THE ARCHITECT OF ANY INADEQUATE CLEARANCES OR CONDITIONS THAT WILL PREVENT THE PROPER INSTALLATION, MAINTENANCE, AND OPERATION OF THE EQUIPMENT.
27. CONFIRM THE TYPE OF CEILING BEING INSTALLED PRIOR TO ORDERING LUMINAIRES AND TRIMS FOR PROPER COORDINATION. LUMINAIRES INDICATED MAY NOT EXPRESSLY CONFIRM TYPE OF CEILING OR OPENING PROVIDED BY OTHER TRADES.
28. CONCEAL ALL CONDUIT; EXPOSED CONDUITS ARE PERMITTED ONLY WHERE SPECIFICALLY SHOWN ON THE DRAWINGS. ALL EXPOSED CONDUITS IN FINISHED AREAS SHALL BE INSTALLED IN THE LEAST VISIBLE LOCATIONS. CARE SHALL BE TAKEN TO INSTALL CONDUIT IN THE MOST AESTHETICALLY PLEASING MANNER.
29. PROVIDE RACEWAY INFRASTRUCTURE FOR TELECOMMUNICATIONS SYSTEMS INCLUDING ALL BACKBOXES AND CONDUIT STUBS INTO CEILING SPACE OR BACK TO CABINET AS SHOWN ON THE DRAWINGS. THE TELECOMMUNICATIONS RACEWAY SYSTEM INSTALLATION SHALL COMPLY WITH TIA/EIA-569-A UNLESS OTHERWISE NOTED. TELECOMMUNICATIONS OUTLETS MAY BE COMBINED ONLY WHERE SPECIFICALLY INDICATED ON THE DRAWINGS. FLEXIBLE CONDUIT SHALL NOT BE UTILIZED FOR TELECOMMUNICATIONS RACEWAY SYSTEMS UNLESS SPECIFICALLY INDICATED. CONDUIT BODIES (e.g. LB, LR, etc.) SHALL NOT BE PERMITTED IN THE TELECOMMUNICATIONS RACEWAY SYSTEMS UNLESS SPECIFICALLY INDICATED TO BE UTILIZED AND LISTED FOR TELECOMMUNICATIONS SYSTEM USE. EACH CONDUIT RUN SHALL NOT HAVE MORE THAN 2-90 DEGREE BENDS. PROVIDE PULLBOXES SIZED IN ACCORDANCE WITH TIA/EIA 569-A WHERE MORE THAN 2-90 DEGREE BENDS ARE ANTICIPATED OR THE LENGTH OF THE CONDUIT RUN EXCEEDS 100 FEET (SEE SCHEDULE BELOW FOR A SAMPLING OF THE REQUIREMENTS). CONDUITS SHALL NOT BE INSTALLED AT RIGHT ANGLES AT THE PULLBOX TO ACCOMMODATE A CHANGE IN DIRECTION. ONLY STRAIGHT PULLS THROUGH THE BOX WILL BE ACCEPTABLE. PROVIDE NYLON PULLSTRING IN ALL RACEWAYS. PROVIDE INSULATED BUSHINGS AT ALL TELECOMMUNICATIONS CONDUIT TERMINATIONS AT ALL BOXES, BACKBOARDS, AND CONDUIT STUBS.
30. PROVIDE NYLON PULLSTRINGS IN ALL EMPTY CONDUITS UNLESS OTHERWISE INDICATED.
31. WIRING DEVICES AND CONDUITS SHALL BE FLUSH MOUNTED, WHEREVER REASONABLY POSSIBLE.
32. PROVIDE TYPEWRITTEN CIRCUIT DIRECTORIES FOR ALL PANELS, NEW OR MODIFIED, REFLECTING THE CIRCUIT ARRANGEMENTS AS THEY WERE ACTUALLY INSTALLED.
33. AN ADHESIVE VINYL NAMEPLATE SHALL BE PROVIDED FOR ALL SWITCHES, RECEPTACLES, [MODULAR FURNITURE POWER CONNECTIONS] [DISCONNECT SWITCHES] [MOTOR STARTERS] AND MISCELLANEOUS DEVICES REQUIRING POWER. THE NAMEPLATE SHALL INDICATE THE PANELBOARD SERVING THE DEVICE AND THE CORRESPONDING CIRCUIT ASSIGNMENT. LETTERING SHALL BE A MINIMUM OF 1/4" HIGH. UTILIZE BROTHER "P-TOUCH" LABEL MAKER OR APPROVED SUBSTITUTE.
34. A GREEN, EQUIPMENT GROUND CONDUCTOR SIZED IN ACCORDANCE WITH THE NEC ARTICLE 250 SHALL BE INSTALLED IN ALL FEEDER AND BRANCH CIRCUITS WHETER INDICATED ON CONTRACT DRAWINGS OR NOT. INSTALL THIS CONDUCTOR IN ALL RACEWAYS INCLUDING THOSE INSTALLED FOR SWITCH LEGS AND ATTACH TO THE DEVICES, LUMINAIRE, OR EQUIPMENT USING A SUITABLE GROUNDING LUG.
35. DO NOT USE A COMMON NEUTRAL FOR MULTIPLE BRANCH CIRCUITS INSTALLED IN A COMMON CONDUIT. PROVIDE A DEDICATED NEUTRAL FOR EACH INDIVIDUAL CIRCUIT. WHERE MULTIPLE DEDICATED NEUTRALS ARE INSTALLED IN A COMMON CONDUIT, PROVIDE COLOR CODING OF THE DIFFERENT NEUTRAL CONDUCTORS IN ACCORDANCE WITH NEC 2014 ARTICLE 200.6 (WHITE, GRAY, THREE CONTINUOUS WHITE OR GRAY STRIPES, ETC.).
36. PROVIDE NYLON PULLSTRINGS IN ALL EMPTY CONDUITS UNLESS OTHERWISE INDICATED.
37. THE TELECOMMUNICATIONS RACEWAY SYSTEM INSTALLATION SHALL COMPLY WITH TIA/EIA-569-A UNLESS OTHERWISE NOTED.
38. CONDUIT BODIES (E.G. LB, LR, ETC.) SHALL NOT BE PERMITTED IN THE TELECOMMUNICATIONS RACEWAY SYSTEMS UNLESS SPECIFICALLY INDICATED TO BE UTILIZED AND LISTED FOR TELECOMMUNICATIONS SYSTEM USE.
39. PROVIDE INSULATED BUSHINGS AT ALL TELECOMMUNICATIONS CONDUIT TERMINATIONS AT ALL BOXES, BACKBOARDS, AND CONDUIT STUBS.
40. ALL SURFACE MOUNTED DEVICES SHALL BE INSTALLED UTILIZING FACTORY PAINTED SURFACE MOUNTING ACCESSORIES AND MATCHING DEVICE BOXES FOR THE MOST AESTHETICALLY PLEASING INSTALLATION.
41. PROVIDE KNOCK-OUT PLUGS FOR ALL UNUSED CONDUIT PENETRATIONS IN BOXES AND ENCLOSURES DUE TO CONDUIT REMOVAL.
42. PENETRATIONS THROUGH FIRE-RATED WALLS, CEILINGS AND FLOORS SHALL BE SEALED TO MAINTAIN FIRE RATINGS. UTILIZE 3M CP25, PUTTY 303 OR OTHER SUITABLE UL-LISTED SEALING SYSTEM.
43. PATCH, REFINISH, AND PAINT ALL PENETRATIONS THROUGH WALLS AND SLABS TO MATCH FINISH OF ADJACENT SURFACES.
44. RESTORE/REPAIR ANY DAMAGE TO EXISTING SURFACES RESULTING FROM THE INSTALLATION OF NEW ELECTRICAL ITEMS. THE AREAS REPAIRED SHALL MATCH THE ADJACENT SURFACES IN TEXTURE, FINISH AND COLOR.
45. PAINTING OF ELECTRICAL EQUIPMENT: PRIME AND PAINT ALL EXPOSED CONDUITS, BOXES, FITTINGS, SUPPORT CHANNELS, MOUNTING HARDWARE AND ACCESSORIES WITH TWO FINISH COATS TO MATCH THE SURFACE ON WHICH THEY ARE MOUNTED OR TO MATCH THE FINISH OF THE ADJACENT SURFACES. EQUIPMENT SURFACES/COMPONENTS WITH A FACTORY-APPLIED PAINT FINISH NEED NOT BE PAINTED.
46. TEST ALL ELECTRICAL EQUIPMENT AND SYSTEMS TO DEMONSTRATE COMPLIANCE WITH THE INTENT OF THE SPECIFICATIONS AND DRAWINGS. GUARANTEE ALL WORK FOR ONE YEAR AFTER FINAL ACCEPTANCE. CORRECT ALL DEFICIENCIES ARISING DURING THIS PERIOD TO THE OWNER'S SATISFACTION AT NO ADDITIONAL COST.

REVISIONS		
#	Date	Description

SCHEMATIC DESIGN
12/14/2020

<p>This work was prepared by me or under my supervision and construction of this project will be under my observation</p>	<p>Supervision and Observation of this project is as defined in Section 1.2 of the Hawaii Administrative Rules, Title 16, Chapter 115, Professional Engineers, Architects, Land Surveyors, and Landscape Architects.</p>
<p>_____</p>	<p>_____</p>
<p>_____</p>	<p>License Expiration Date</p>

PROJECT TITLE

KAUAI HHSC CT
SCANNER RENOVATIONS

KVMH - COVID LAB

FILENAME:
C:\Users\keola\Documents\KVMH Covid Lab E18_kvilliams25L9J.rvt

DRAWING TITLE

ELECTRICAL SPECIFICATIONS
AND GENERAL NOTES

SCALE:	
DRAWN BY:	CHECKED BY:
JB	RT
PROJECT NO.	DRAWING NO.
20162	E-001
SHEET ISSUE DATE:	
12/14/2020	

FIRE ALARM GENERAL NOTES:

1. SEC 1.14 (NFPA 1 2012, AS AMENDED) PLAN REVIEW 1.14.4 REVIEW AND APPROVAL BY THE AHJ SHALL NOT RELIEVE THE APPLICANT OF THE RESPONSIBILITY OF COMPLIANCE WITH THIS CODE.
2. AHJ APPROVAL:
 - A. 13.1.1 (NFPA 1 2012, AS AMENDED) THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE THAT CONSTRUCTION DOCUMENTS FOR ALL FIRE PROTECTION SYSTEMS BE SUBMITTED FOR REVIEW AND APPROVAL AND A PERMIT BE ISSUED PRIOR TO THE INSTALLATION, REHABILITATION, OR MODIFICATION. FURTHER, THE AHJ SHALL HAVE THE AUTHORITY TO REQUIRE THAT FULL ACCEPTANCE TESTS OF THE SYSTEMS BE PERFORMED IN THE AHJ'S PRESENCE PRIOR TO FINAL SYSTEM CERTIFICATION.
 - B. FIRE ALARM SYSTEMS; FIRE HYDRANT SYSTEMS; FIRE-EXTINGUISHING SYSTEMS; STANDPIPES; AND OTHER FIRE-PROTECTION SYSTEMS AND APPURTENANCES REQUIRED BY THIS CODE SHALL BE APPROVED BY THE AHJ AS TO INSTALLATION AND LOCATION AND SHALL BE SUBJECT TO ACCEPTANCE TESTS REQUIRED BY THE APPROPRIATE COUNTY AGENCY. A COPY OF A SYSTEM'S UNSATISFACTORY INSPECTION AND MAINTENANCE TEST REPORT SHALL BE SUBMITTED TO THE AHJ BY THE TESTING COMPANY WITHIN FIVE (5) WORKING DAYS AFTER THE COMPLETION OF THE TEST. NFPA 1 2012, CHAPTER 13, AS AMENDED.
3. SEC. 18-3.1 (C&C HONOLULU ROH CHAPTER 18) REQUIRED
 - A. NO PERSON SHALL PERFORM ANY OF THE FOLLOWING OR CAUSE ANY OF THE FOLLOWING TO BE PERFORMED WITHOUT FIRST OBTAINING A BUILDING PERMIT THEREFORE AS PRESCRIBED IN THIS SECTION:
 - i. ERECT, CONSTRUCT, ENLARGE, ALTER, REPAIR, MOVE, IMPROVE, REMOVE, CONVERT OR DEMOLISH ANY BUILDING OR STRUCTURE.
 - ii. ANY ELECTRICAL WORK
 - iii. INSTALL, REMOVE, ALTER, REPAIR OR REPLACE ANY PLUMBING, FIRE SPRINKLER, GAS OR DRAINAGE PIPING WORK OR ANY FIXTURE, GAS APPLIANCE, OR WATER HEATING OR TREATING EQUIPMENT; OR
 - iv. CONSTRUCT, RECONSTRUCT OR IMPROVE ANY SIDEWALK, CURB OR DRIVEWAY IN ANY PUBLIC STREET RIGHT-OF-WAY.
4. SEC. 18-5.2 (C&C HONOLULU ROH CHAPTER 18) RETENTION OF PLANS ONE SET OF APPROVED PLANS, SPECIFICATIONS, AND COMPUTATIONS SHALL BE RETAINED BY THE BUILDING OFFICIAL FOR A PERIOD OF NOT LESS THAN 90 DAYS FROM DATE OF COMPLETION OF THE WORK COVERED THEREIN, AND ONE SET OF APPROVED PLANS SHALL BE RETURNED TO THE APPLICANT, AND SAID SET SHALL BE KEPT ON THE SITE OF THE BUILDING OR WORK AT ALL TIMES DURING WHICH THE WORK AUTHORIZED THEREBY IS IN PROGRESS. (SEC. 18-5.2 R.O. 1978 (1983 ED.); AM. ORD. 93-59).
5. SEC 13.7.3.2.1 (NFPA 1 2012, AS AMENDED) APPROVAL AND ACCEPTANCE
 - A. 13.7.3.2.1.1 THE AHJ SHALL BE NOTIFIED PRIOR TO INSTALLATION OR ALTERATION OF EQUIPMENT OR WIRING.
 - B. 13.7.3.2.1.2 AT THE AHJ'S REQUEST, COMPLETE INFORMATION REGARDING THE SYSTEM OR SYSTEM ALTERATIONS, INCLUDE SPECIFICATIONS, TYPE OF SYSTEM OR SERVICE, SHOP DRAWINGS, INPUT/OUTPUT MATRIX, BATTERY CALCULATIONS, AND NOTIFICATION APPLIANCE CIRCUIT VOLTAGE DROP CALCULATIONS, SHALL BE SUBMITTED FOR APPROVAL.
 - C. 13.7.3.2.1.3 BEFORE REQUESTING FINAL APPROVAL OF THE INSTALLATION, IF REQUIRED BY THE AHJ, THE INSTALLING CONTRACTOR SHALL FURNISH A WRITTEN STATEMENT STATING THAT THE SYSTEM HAS BEEN INSTALLED IN ACCORDANCE WITH APPROVED PLANS AND TESTED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND APPROPRIATE NFPA REQUIREMENTS.
 - D. 13.7.3.2.1.4* THE RECORD OF COMPLETION FORM, FIGURE 10.18.2.1.1 OF NFPA 72, SHALL BE PERMITTED TO BE A PART OF THE WRITTEN STATEMENT REQUIRED IN 13.7.3.2.1.3. WHEN MORE THAN ONE CONTRACTOR HAS BEEN RESPONSIBLE FOR THE INSTALLATION, EACH CONTRACTOR SHALL COMPLETE THE PORTIONS OF THE FORM FOR WHICH THAT CONTRACTOR HAD RESPONSIBILITY.
 - E. 13.7.3.2.1.5 THE RECORD OF COMPLETION FORM, FIGURE 10.18.2.1.1 OF NFPA 72, SHALL BE PERMITTED TO BE A PART OF THE DOCUMENTS THAT SUPPORT THE REQUIREMENTS OF 13.7.3.2.2.4.
6. SEC 13.7.1.1 (NFPA 1 2012, AS AMENDED) WHERE BUILDING FIRE ALARM SYSTEMS OR AUTOMATIC FIRE DETECTORS ARE REQUIRED BY OTHER SECTIONS OF THIS CODE, THEY SHALL BE PROVIDED AND INSTALLED IN ACCORDANCE WITH NFPA 70, NFPA 72, NATIONAL FIRE ALARM AND SIGNALING CODE, AND SECTION 13.7. NFPA 1 2012, AS AMENDED. FIRE ALARM SYSTEM INSTALLATION AND MAINTENANCE SHALL BE IN ACCORDANCE WITH NFPA 72, NATIONAL FIRE ALARM AND SIGNALING CODE AND NFPA 1, 2012, AS AMENDED.
7. SEC 10.15 (NFPA 72 2010) PROTECTION OF FIRE ALARM SYSTEM IN AREAS THAT ARE NOT CONTINUOUSLY OCCUPIED, AUTOMATIC SMOKE DETECTION SHALL BE PROVIDED AT THE LOCATION OF EACH FIRE ALARM CONTROL UNIT(S), NOTIFICATION APPLIANCE CIRCUIT POWER EXTENDERS, AND SUPERVISING STATION TRANSMITTING EQUIPMENT TO PROVIDE NOTIFICATION OF FIRE AT THAT LOCATION. EXCEPTION: WHERE AMBIENT CONDITIONS PROHIBIT INSTALLATION OF AUTOMATIC SMOKE DETECTION, AUTOMATIC HEAT DETECTION SHALL BE PERMITTED.
8. NOTIFICATION SIGNALS
 - A. 13.7.1.4.10.5 (NFPA 1 2012, AS AMENDED) UNLESS OTHERWISE PROVIDED IN 13.7.1.10.9.5.1 THROUGH 13.7.1.4.10.5.8, NOTIFICATION SIGNALS FOR OCCUPANTS TO EVACUATE SHALL BE AUDIBLE AND VISIBLE SIGNALS IN ACCORDANCE WITH NFPA 72 AND ICC/ANSI A1177.1, AMERICAN NATIONAL STANDARD FOR ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES, OR OTHER MEANS OF NOTIFICATION ACCEPTABLE TO THE AHJ SHALL BE PROVIDED.
 - B. 13.7.1.4.9.5.1 (NFPA 1 2012, AS AMENDED) AREAS NOT SUBJECT TO OCCUPANCY BY PERSONS WHO ARE HEARING IMPAIRED SHALL NOT BE REQUIRED TO COMPLY WITH THE PROVISIONS FOR VISIBLE SIGNALS.
9. VISIBILITY
 - A. SEC 18.5.1* (NFPA 72 2010) VISIBLE SIGNALING. PUBLIC MODE VISIBLE SIGNALING SHALL MEET THE REQUIREMENTS OF SECTION 18.5 USING VISIBLE NOTIFICATION APPLIANCES.
 - B. SEC A.18.5.1 (NFPA 72 2010) THERE ARE TWO METHODS OF VISIBLE SIGNALING. THESE ARE METHODS IN WHICH NOTIFICATION OF AN EMERGENCY CONDITION IS CONVEYED BY DIRECT VIEWING OF THE ILLUMINATING APPLIANCE OR BY MEANS OF ILLUMINATION OF THE SURROUNDING AREA. VISIBLE NOTIFICATION APPLIANCES USED IN THE PUBLIC MODE MUST BE OF A TYPE, SIZE, INTENSITY, AND NUMBER SO THAT THE OPERATING EFFECT OF THE APPLIANCE IS SEEN BY THE INTENDED VIEWERS REGARDLESS OF THE VIEWERS ORIENTATION.
 - C. SEC 18.5.4.1* (NFPA 72 2010) WALL-MOUNTED APPLIANCES SHALL BE MOUNTED SUCH THAT THE ENTIRE LENS IS NOT LESS THAN 80 INCHES AND NOT GREATER THAN 96 INCHES ABOVE THE FINISHED FLOOR OR AT THE MOUNTING HEIGHT SPECIFIED USING THE PERFORMANCE-BASED ALTERNATIVE OF 18.5.4.5.
 - D. SEC 18.5.4.3.2 (NFPA 72 2010) VISIBLE NOTIFICATION APPLIANCES SHALL BE INSTALLED IN ACCORDANCE WITH TABLE 18.5.4.3.1(A), USING ONE OF THE FOLLOWING:
 - i. A SINGLE VISIBLE NOTIFICATION APPLIANCE
 - ii. TWO VISIBLE NOTIFICATION APPLIANCES LOCATED ON OPPOSITE WALLS
 - iii. *TWO GROUPS OF VISIBLE NOTIFICATION APPLIANCES, WHERE VISUAL APPLIANCES OF EACH GROUP ARE SYNCHRONIZED, IN THE SAME ROOM OR ADJACENT SPACE WITHIN THE FIELD OF VIEW. THIS SHALL INCLUDE:
 - 1) *MORE THAN TWO VISIBLE NOTIFICATION APPLIANCES IN THE SAME ROOM OR ADJACENT SPACE WITHIN THE FIELD OF VIEW THAT FLASH IN SYNCHRONIZATION
13. AUDIBILITY
 - A. SEC 13.7.1.4.10.8 (NFPA 1 2012, AS AMENDED) AUDIBILITY. AUDIBLE ALARM NOTIFICATION APPLIANCES SHALL PRODUCE SIGNALS THAT ARE DISTINCTIVE FROM AUDIBLE SIGNALS USED FOR OTHER PURPOSES IN A GIVEN BUILDING. [101:9.6.3.8]
 - B. SEC 18.4.3.1* (NFPA 72 2010) TO ENSURE THAT AUDIBLE PUBLIC MODE SIGNALS ARE CLEARLY HEARD, UNLESS OTHERWISE PERMITTED BY 18.4.3.2 THROUGH 18.4.3.5, THEY SHALL HAVE A SOUND LEVEL AT LEAST 15dB ABOVE THE AVERAGE AMBIENT SOUND LEVEL OR 5dB ABOVE THE MAXIMUM SOUND LEVEL HAVING A DURATION OF AT LEAST 60 SECONDS, WHICHEVER IS GREATER, MEASURED 5 FEET ABOVE THE FLOOR IN THE AREA REQUIRED TO BE SERVED BY THE SYSTEM USING THE A-WEIGHTED SCALE.
 - C. SOUND LEVELS FOR ALARM SIGNALS SHALL BE 110 DECIBELS MAXIMUM.
 - D. THE CONTRACTOR AND FIRE ALARM VENDOR SHALL ENSURE AUDIBILITY IS MET THROUGH ALL OCCUPIABLE AREAS AND SPACES. AUDIBILITY WILL BE THOROUGHLY CHECKED AT THE TIME OF ALARM ACCEPTANCE TESTING.
 - E. THE STANDARD EVACUATION SIGNAL SHALL BE SYNCHRONIZED WITHIN A NOTIFICATION ZONE.
 - F. SEC 18.4.8.1 (NFPA 72 2010) IF CEILING HEIGHTS ALLOW, AND UNLESS OTHERWISE PERMITTED BY 18.4.8.2 THROUGH 18.4.8.5, WALL-MOUNTED APPLIANCES SHALL HAVE THEIR TOPS ABOVE THE FINISHED FLOORS AT HEIGHTS OF NOT LESS THAN 90 INCHES AND BELOW THE FINISHED CEILING.
14. TAG

SEC 13.7.3.2.5 (NFPA 1 2012, AS AMENDED) A TAG SHALL BE PLACED ON THE FIRE ALARM PANEL WHEN TESTED IN ACCORDANCE WITH SECTION 13.7.3.2. INFORMATION ON THE TAG SHALL INCLUDE THE DATE OF TESTING, TESTING COMPANY, AND CONTACT INFORMATION. TECHNICIAN PERFORMING THE TEST, AND THAT THE TEST WAS SATISFACTORY.

15. PRIOR TO COMMENCING ANY WORK ON THE EXISTING FIRE ALARM SYSTEM, CONFIRM THAT THE SYSTEM IS OPERATING PROPERLY BY TESTING THE SYSTEM IN THE PRESENCE OF THE OWNER'S DESIGNATED REPRESENTATIVE OR OBTAINING A CLEARANCE FROM THE ARCHITECT. ANY PRE-EXISTING DEFICIENCIES SHOULD BE NOTED AT THIS TIME AND PRESENTED TO THE ARCHITECT FOR THEIR ACTION. THE CONTRACTOR WILL BE RESPONSIBLE FOR REPAIRING ANY ENSUING SYSTEM DEFICIENCIES NOT DOCUMENTED DURING THIS PRELIMINARY TESTING/CONFIRMATION PERIOD AT NO ADDITIONAL COST TO THE PROJECT.
16. COORDINATE ALL FIRE ALARM SYSTEM WORK WITH XXXXXXXXXXXX. PAY FOR ALL CHARGES LEVIED BY XXXXXXXXXXXX FOR SERVICES RENDERED.
17. XXXXXXXXXXXX SHALL BE PRESENT FOR THE PRELIMINARY AND FORMAL ACCEPTANCE TESTING OF THE FIRE ALARM SYSTEM. OBTAIN CERTIFICATE OF APPROVAL FROM THE FIRE DEPARTMENT (AHJ) AND DELIVER TO THE ARCHITECT.

COUNTY OF KAUA'I
CHAPTER 12, KAUA'I COUNTY BUILDING CODE
KAUA'I COUNTY CODE 1987, AS AMENDED
ARTICLE 6 – ENERGY CONSERVATION CODE

TO THE BEST OF MY KNOWLEDGE, THIS PROJECT'S DESIGN SUBSTANTIALLY CONFORMS TO:
SECTION 12-6.3 ADOPTION OF THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
SECTION 12-6.4 LOCAL AMENDMENTS TO THE IECC
FOR ELECTRICAL AND LIGHTING SYSTEMS (SECTION C405 AND C408).

COMPLIANCE METHOD

<input type="checkbox"/> 2015 IECC AS AMENDED. MANDATORY & PRESCRIPTIVE		
<input type="checkbox"/> 2015 IECC AS AMENDED. MANDATORY & TOTAL BUILDING PERFORMANCE		
<input type="checkbox"/> ASHRAE STANDARD 90.1-2013. MANDATORY & PRESCRIPTIVE		
<input type="checkbox"/> ASHRAE STANDARD 90.1-2013. MANDATORY & ENERGY COST BUDGET		

INFORMATION IN CONSTRUCTION DOCUMENTS	YES	N/A
INTERIOR LIGHTING		
OCCUPANT SENSOR CONTROLS. C405.2.1	<input type="checkbox"/>	<input type="checkbox"/>
TIME SWITCH CONTROLS. C405.2.2	<input type="checkbox"/>	<input type="checkbox"/>
DAYLIGHT RESPONSIVE CONTROLS. C405.2.3	<input type="checkbox"/>	<input type="checkbox"/>
DAYLIGHT ZONES ON PLANS. C405.2.3.2 & C405.2.3.3	<input type="checkbox"/>	<input type="checkbox"/>
GUEST ROOM CONTROLS. C405.2.4	<input type="checkbox"/>	<input type="checkbox"/>
INTERIOR LIGHTING FIXTURE SCHEDULE	<input type="checkbox"/>	<input type="checkbox"/>
INPUT POWER FOR INTERIOR LIGHTING FIXTURES. C405.4.1	<input type="checkbox"/>	<input type="checkbox"/>
INTERIOR LIGHTING FIXTURE LOCATIONS	<input type="checkbox"/>	<input type="checkbox"/>
LIGHTING CONTROL FUNCTIONAL PERFORMANCE	<input type="checkbox"/>	<input type="checkbox"/>
TESTING REQUIREMENT. C408.3		
EXTERIOR LIGHTING		
EXTERIOR LIGHTING CONTROLS. C405.2.5	<input type="checkbox"/>	<input type="checkbox"/>
EXTERIOR LIGHTING FIXTURE SCHEDULE	<input type="checkbox"/>	<input type="checkbox"/>
INPUT POWER FOR EXTERIOR LIGHTING FIXTURES	<input type="checkbox"/>	<input type="checkbox"/>
EXTERIOR LIGHTING FIXTURE LOCATIONS	<input type="checkbox"/>	<input type="checkbox"/>
ELECTRICAL		
ELECTRICAL TRANSFORMER EFFICIENCY. C405.7	<input type="checkbox"/>	<input type="checkbox"/>
TENANT SUBMETERING. C405.10	<input type="checkbox"/>	<input type="checkbox"/>

SIGNATURE: _____

DATE: _____

NAME: _____

TITLE: ELECTRICAL ENGINEER

LICENSE No.: _____

ENGINEER
STAMP
HERE

#	Date	Description

SCHEMATIC DESIGN
12/14/2020

This work was prepared by me or under my supervision and construction of this project will be under my observation

Supervision and Observation of this project is as defined in Section 1.2 of the Hawaii Administrative Rules, Title 16, Chapter 115, Professional Engineers, Architects, Land Surveyors, and Landscape Architects.

License Expiration Date

**KAUAI HHSC CT
SCANNER RENOVATIONS**

KVMH - COVID LAB

FILENAME:
C:\Users\keola\Documents\KVMH Covid Lab E18_kvlliams25L9J.rvt

FIRE ALARM GENERAL NOTES

SCALE:

DRAWN BY: JB	CHECKED BY: RT
PROJECT NO. 20162	DRAWING NO. E-002
SHEET ISSUE DATE: 12/14/2020	

ELECTRICAL SYMBOL LIST / MOUNTING HEIGHT SCHEDULE

MOUNTING HEIGHT FROM FLOOR TO		(SPECIAL MOUNTING HEIGHTS INDICATED ON PLAN)		DESCRIPTION
		SYMBOL		
TOP	℄	EXISTING	NEW	
				LED FIXTURE, 2X4 CEILING GRID MOUNTED
				LED FIXTURE, 2X4 CEILING GRID MOUNTED WITH EMERGENCY BATTERY UNIT
46"		\$ ^a	\$ ^a	LIGHT SWITCH, FLUSH WALL MOUNTED, 1P20A, 120/277V, 1HP MAX. (LETTER INDICATES LUMINAIRES CONTROLLED)
18"				RECEPTACLE, DUPLEX, GROUNDING TYPE, 125V, NEMA TYPE 5-15R
18"				RECEPTACLE, DUPLEX, GFCI TYPE, 125V, NEMA TYPE 5-20R
				RECEPTACLE, DUPLEX, 6" ABOVE COUNTER TOP
				RECEPTACLE, DUPLEX, GFCI, 6" ABOVE COUNTER TOP
7'-6"				CLOCK OUTLET, 2P15A, 125V
				JUNCTION BOX, WALL MOUNTED
				MOTOR CONNECTION
				NON-FUSED DISCONNECT SWITCH, 3P30A UNLESS OTHERWISE NOTED, VOLTAGE TO MATCH CIRCUITING
				PANELBOARD
				TELEPHONE OUTLET BOX, WALL MOUNTED WITH BLANK DEVICE PLATE
				DATA OUTLET, WALL MOUNTED, WITH BLANK DEVICE PLATE
6'-10"				FIRE ALARM HORN/VISUAL (15 CANDELA UNLESS OTHERWISE NOTED) SIGNALLING DEVICE, SEMI - FLUSH WALL MOUNTED

REVISIONS

#	Date	Description

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12/14/2020

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License Expiration Date

PROJECT TITLE

**KAUAI HHSC CT
SCANNER RENOVATIONS**

KVMH - COVID LAB

FILENAME:
C:\Users\keola\Documents\KVMH Covid Lab
E18_kvilliams25L9J.rvt

DRAWING TITLE

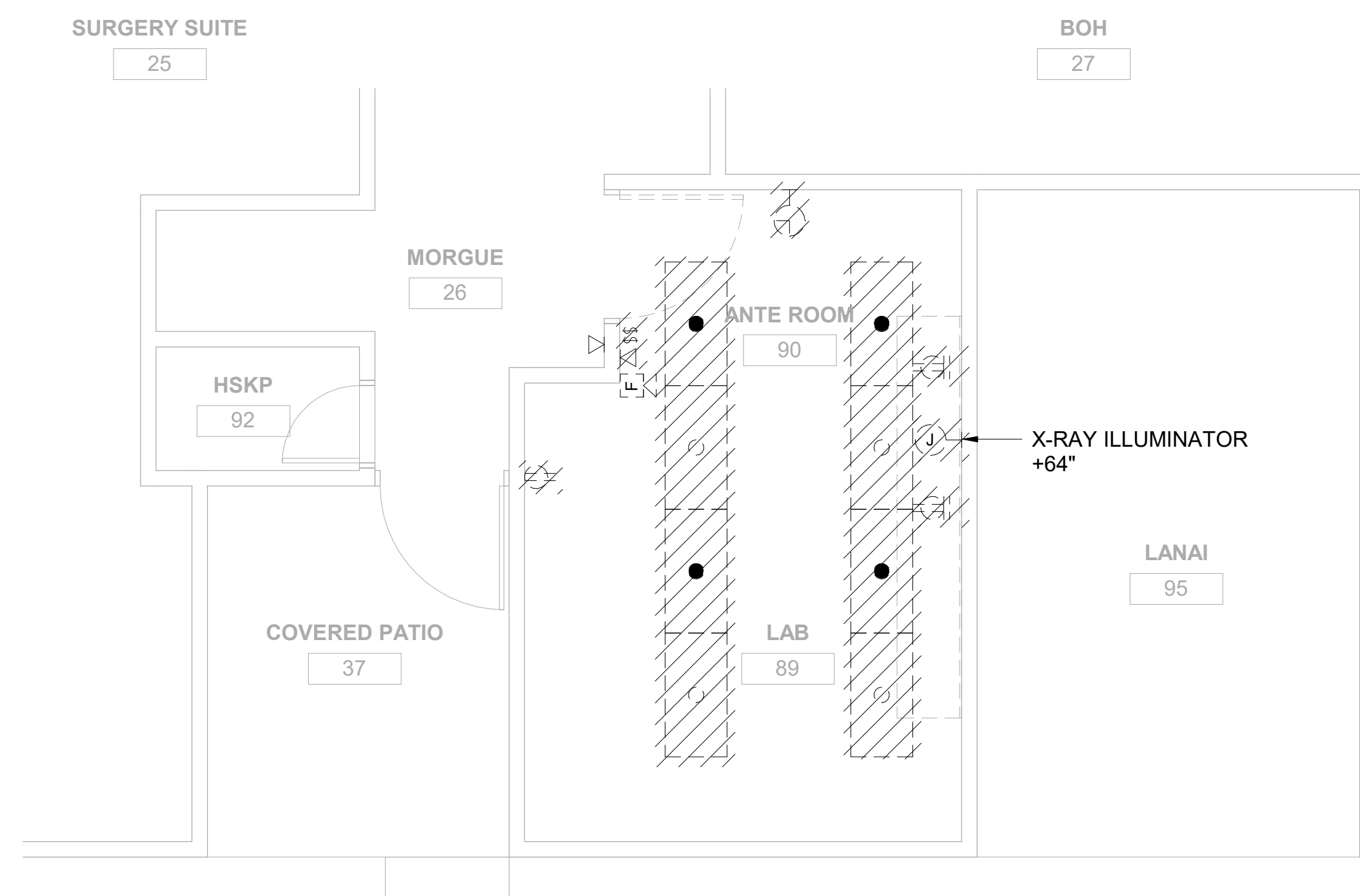
ELECTRICAL SYMBOL LIST

SCALE:

DRAWN BY: JB	CHECKED BY: RT
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PROJECT NO. 20162	DRAWING NO.
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SHEET ISSUE DATE: 12/14/2020	E-003
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1 COVID LAB ELECTRICAL DEMO PLAN
SCALE: 1/4" = 1'-0"



REVISIONS		
#	Date	Description
SCHEMATIC DESIGN		
12/14/2020		

This work was prepared by me or under my supervision and construction of this project will be under my observation.

Supervision and Observation of this project is as defined in Section 1.2 of the Hawaii Administrative Rules, Title 16, Chapter 115, Professional Engineers, Architects, Land Surveyors, and Landscape Architects.

License Expiration Date

PROJECT TITLE

**KAUAI HHSC CT
SCANNER RENOVATIONS**

KVMH - COVID LAB

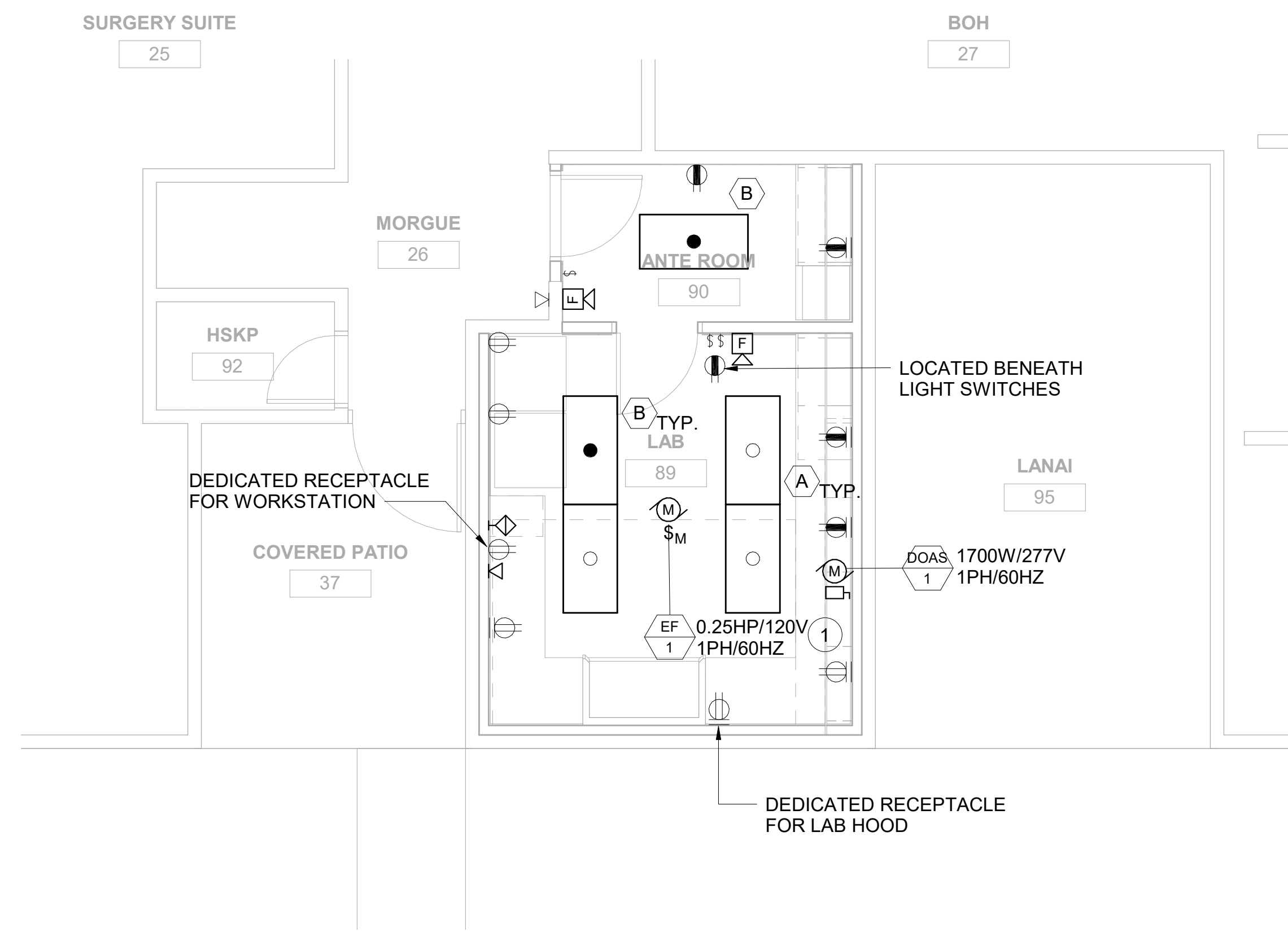
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DRAWING TITLE

**COVID LAB ELECTRICAL DEMO
PLAN**

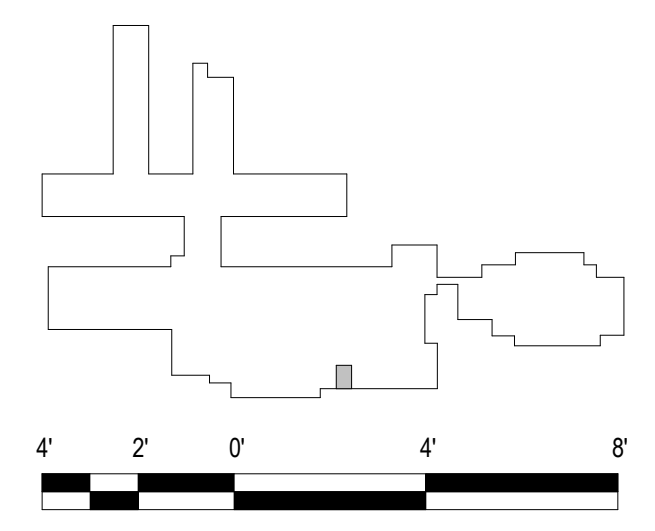
SCALE: 1/4" = 1'-0"

DRAWN BY: JB	CHECKED BY: RT
PROJECT NO. 20162	DRAWING NO. E-101
SHEET ISSUE DATE: 12/14/2020	



SHEET NOTES:
 ① (N) EXHAUST FAN EQUIPMENT CONNECTION LOCATED ON ROOF.

① COVID LAB ELECTRICAL PLAN
 SCALE: 1/4" = 1'-0"



REVISIONS		
#	Date	Description
SCHEMATIC DESIGN		
12/14/2020		

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License Expiration Date _____

PROJECT TITLE

**KAUAI HHSC CT
 SCANNER RENOVATIONS**

KVMH - COVID LAB

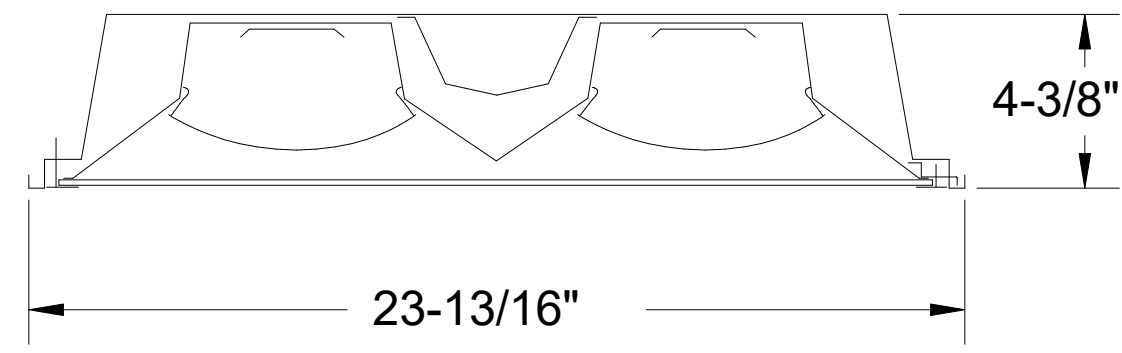
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DRAWING TITLE

COVID LAB ELECTRICAL PLAN

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

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PROJECT NO. 20162	DRAWING NO. E-102
SHEET ISSUE DATE: 12/14/2020	



B	277	4000K, 80 CRI 48W LED, 5900 LUMENS	2'x4' CEILING GRID RECESSED MOUNT 0-10V DIMMING CAPABILITIES 10W INTEGRATED EMERGENCY BATTERY HEW 50G-S24-L59/840-SAF12125-EM/10W-DIM-UNV (OR APPROVED EQUAL)
A	277	4000K, 80 CRI 48W LED, 5900 LUMENS	2'x4' CEILING GRID RECESSED MOUNT 0-10V DIMMING CAPABILITIES HEW 50G-S24-L59/840-SAF12125-DIM-UNV (OR APPROVED EQUAL)
TYPE	VOLTS	LAMPS	MOUNTING AND OPTIONS

REVISIONS

#	Date	Description

SCHEMATIC DESIGN
12/14/2020

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License Expiration Date

PROJECT TITLE

**KAUAI HHSC CT
SCANNER RENOVATIONS**

KVMH - COVID LAB

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DRAWING TITLE

LUMINAIRE SCHEDULE

SCALE:

DRAWN BY: JB	CHECKED BY: RT
PROJECT NO. 20162	DRAWING NO. E-501
SHEET ISSUE DATE: 12/14/2020	